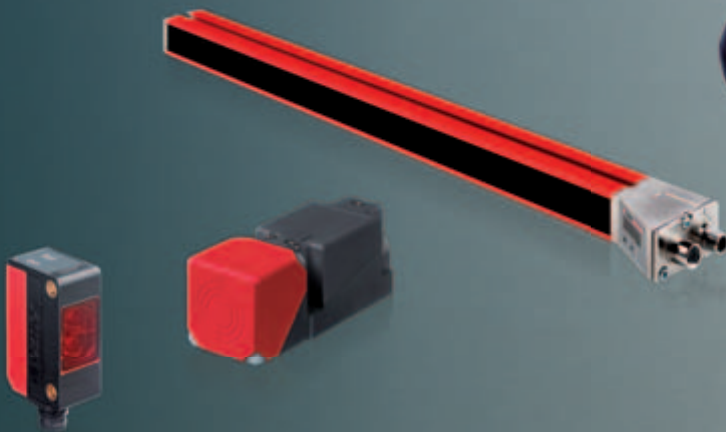


Catalog 2013



Optoelectronic Sensors Inductive Switches

How to find the product you're looking for

The series/product group overview pages ...

Leuze electronic

OVERVIEW

Mark detection Extension control Bar code reading

Dimensioned drawing

A Operational control
B Indicator diode
C 90° turning connector

Further details can be found in the respective data sheet.

Leuze electronic

8 SERIES

Operating principle	Typ. operating range limits	Page
Throughbeam sensors	0 ... 20 m	72
Retro-reflective sensors	0 ... 20 m	74
Diffuse reflection scanners	5 ... 800 mm	78

Other 8 Series products:

Optical distance sensors	ODSL 8	268
Luminescence scanners	LRT 8	496

Common technical data

Electrical data	Operating voltage U_0	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_0
	Open-circuit current	$\leq 35\text{mA}$
	Signal voltage high/low (operation)	$> (U_0 - 2V) \leq 2V$
Indicators	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Metal
	Optics cover	Glass
Environmental data	Weight (connector/cable)	70g/140g
	Ambient temperature (operation)	-40°C ... +60°C
	VDE safety class	Laser: -10°C ... +40°C
	Protection class	IP 67, IP 69K
	Standards applied	IEC 60947-5-2, UL 508

Features

- Metal housing
- IP 67 and IP 69K
- Active ambient light suppression A/LIS
- Interference-immune push-pull outputs
- Laser devices
- Expanded temperature range: -40°C to +60°C
- M12 turning connector

Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A/LS Page 697

Mounting systems for this series can be found from page 629 onwards

The product selection tables ...

Leuze electronic

THROUGHBEAM SENSORS

Part description	Operating range [m]	Switching	Light source	Output	Switching	Connection	Option	Accessories	Typ. light spot
Throughbeam sensors									
▶ Transmitter ◀ Receiver									
▶ LSSR 8 - S12	50036354	1500Hz	Red light	2xPNP/DC	Light/dark anti-void	M12 connector	3	a, b, c, d, e, f	
◀ LLSR 8 / 44 - S12	50036356	1500Hz	Red light	2xPNP/DC	Light/dark anti-void	Cable, 2m	3	a, b, c, d, e, f	
▶ LSSR 8 - S12	50036355	1500Hz	Red light	2xPNP/DC	Light/dark anti-void	M12 connector	3	a, b, c, d, e, f	
◀ LLSR 8 / 66 - S12	50036359	1500Hz	Red light	2xPush-pull/DC	Light/dark anti-void	Cable, 2m	3	a, b, c, d, e, f	
▶ LSSR 8 - S12	50036354	1500Hz	Red light	2xPush-pull/DC	Light/dark anti-void	M12 connector	3	a, b, c, d, e, f	
◀ LLSR 8 / 66 - S12	50036359	1500Hz	Red light	2xPush-pull/DC	Light/dark anti-void	Cable, 2m	3	a, b, c, d, e, f	
Throughbeam laser sensors									
▶ LSSRL 8.9 - S12	50036358	2800Hz	Laser class 2	PNP/DC	Light	M12 connector	1, 2, 3	a, b, c, d, e, f	
◀ LLSRL 8 / 24.01 - S12	50036359	2800Hz	Laser class 2	PNP/DC	Light	Cable, 2m	1, 2, 3	a, b, c, d, e, f	
▶ LSSRL 8.9	50037083	2800Hz	Laser class 2	PNP/DC	Light	M12 connector	1, 2, 3	a, b, c, d, e, f	
◀ LLSRL 8 / 24.01	50037084	2800Hz	Laser class 2	PNP/DC	Light	Cable, 2m	1, 2, 3	a, b, c, d, e, f	

Accessories / connection cables

Part no.	Designation	Features
a	50104543	K - D M12W - 4P - 2m - PVC
b	50104542	K - D M12A - 4P - 2m - PVC
c	50104545	K - D M12W - 4P - 5m - PVC
d	50104544	K - D M12A - 4P - 5m - PVC
e	50104547	K - D M12W - 4P - 10m - PVC
f	50104546	K - D M12A - 4P - 10m - PVC

Options

- Adjustable focus
- Sensitivity adjustment via potentiometer
- UL approval

Leuze electronic

8 SERIES

Throughbeam sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694
- Sensors w. Laser transmitter Page 695

Electrical connection

LSR 8-4	LSR 8-6
LSR 8-4-S12	LSR 8-6-S12
1 → 1	1 → 1
2 → 2	2 → 2
3 → 3	3 → 3
4 → 4	4 → 4
5 → 5	5 → 5
6 → 6	6 → 6
7 → 7	7 → 7
8 → 8	8 → 8
9 → 9	9 → 9
10 → 10	10 → 10
11 → 11	11 → 11
12 → 12	12 → 12
13 → 13	13 → 13
14 → 14	14 → 14
15 → 15	15 → 15
16 → 16	16 → 16
17 → 17	17 → 17
18 → 18	18 → 18
19 → 19	19 → 19
20 → 20	20 → 20

Options

- Adjustable focus
- Sensitivity adjustment via potentiometer
- UL approval

- ① Dimensioned drawing
- ② Current subchapter
- ③ Current chapter
- ④ Available function principles
- ⑤ Other products in this series/product group
- ⑥ Technical data
- ⑦ Special features

- ⑧ Reference to explanations in Optical Sensor ABCs
- ⑨ Web link
- ⑩ Product selection table with specific data
- ⑪ Table with connection accessories
- ⑫ Electrical connection diagrams
- ⑬ Product-specific options

COMPANY PORTRAIT

At Leuze electronic, we are "the sensor people": for 50 years we have been the specialists for innovative and practical solutions in the area of optical sensors for factory automation. Our systems are used in the automotive industry, in conveyor and storage systems, the packaging and analytical industry, as well as in the areas of handling and assembly technology and electronics.

Our dedicated employees are characterized, above all, by their customer focus. There's one thing Leuze electronic customers can count on – on us.

The range of products extends from optical electronic sensors, inductive switches and identification and data transmission systems to image processing systems and optical electronic solutions for workplace safety.

On the basis of extensive research and development work and the large application know-how possessed by our engineers, we are constantly further developing our systems.



All with the goal of being able to offer our customers increasingly efficient and higher performance solutions at an optimal price / performance ratio.

We are the right partner for both standard applications as well as for high-end solutions, and with an extensive sales and service network, we can always be reached quickly.

Photoel. sensors/
light scanners,
cubic housing

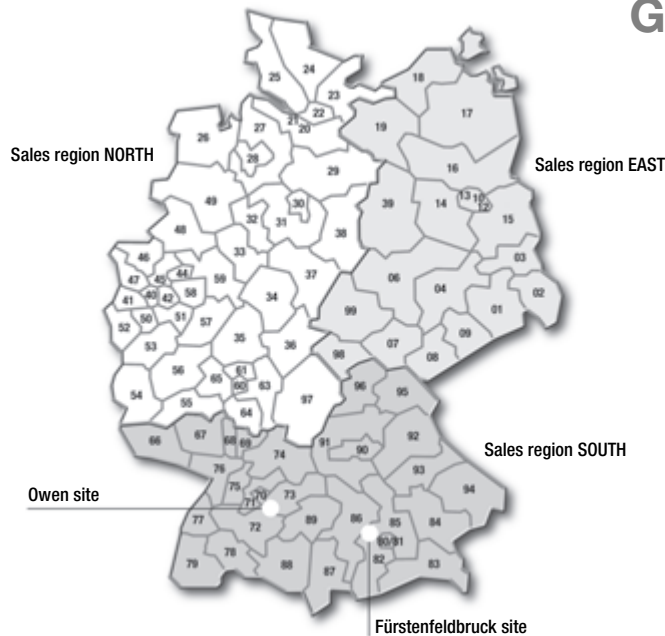
Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

GERMAN SALES



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

With a staff of qualified field representatives and our capable Customer Support Center, we are able to provide you with service around the clock. Our dedication to qualified service and focus on the customer have always been among our distinguishing characteristics.

Light
Curtains

Customer Support Center Sales / Germany

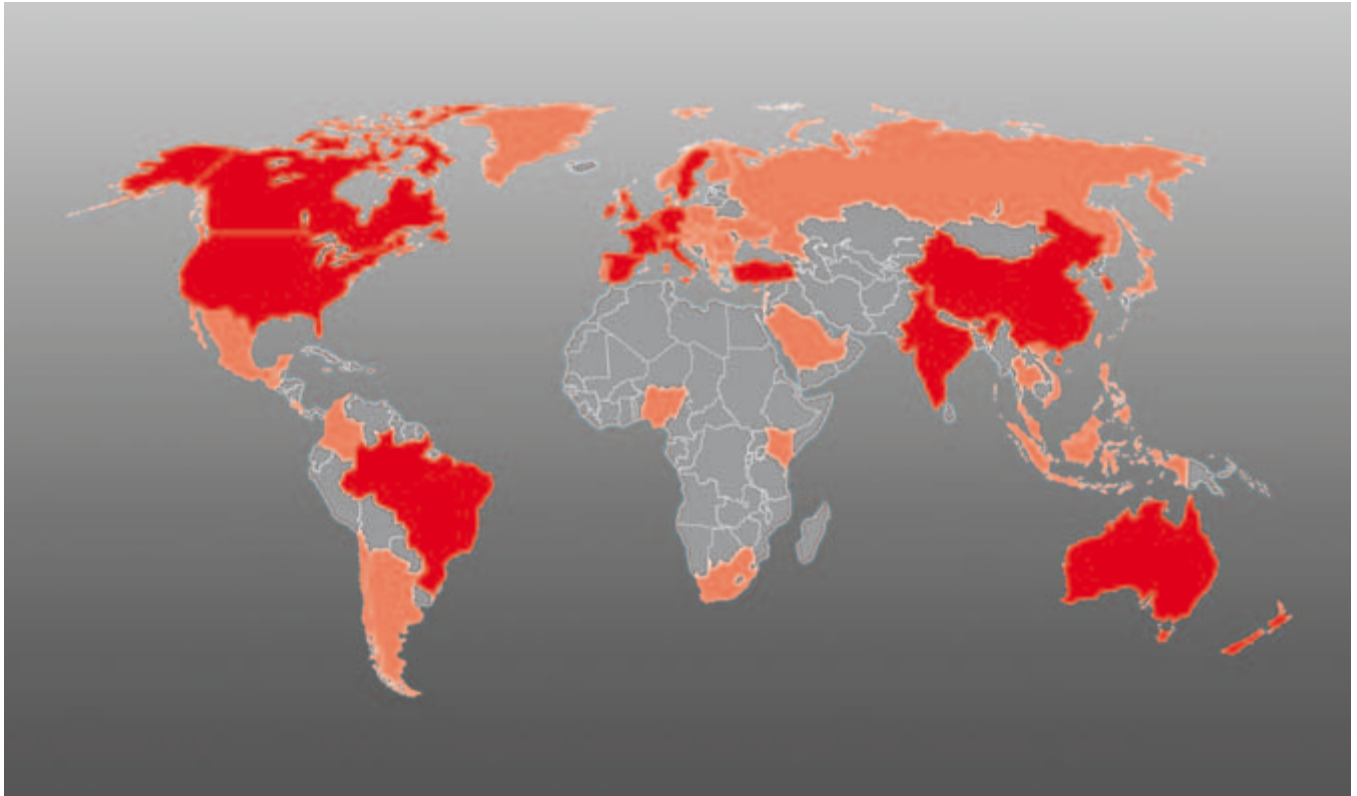
Sales Region North	Tel. +49 7021 / 573-306
Sales Region South	Tel. +49 7021 / 573-307
Sales Region East	Tel. +49 7021 / 573-308
	Tel. +49 35027 / 629-106

Technical Hot-line

Optical Sensors Division	Tel. +49 7021 / 573-217
Logistics Division	Tel. +49 7021 / 573-123
Safety Systems Division	Tel. +49 8141 / 5350-111

Protective
Sensors

GLOBAL SALES



Through our constantly growing number of subsidiaries and sales partners around the world, we can guarantee you a uniform level of qualified advice, fast delivery times and reliable support during mounting and commissioning of your systems at nearly every location on earth.

■ Subsidiaries		■ Sales Partners	
AUSTRALIA	Balluff-Leuze Pty. Ltd. BAYSWATER	ARGENTINA	MEXICO
BELGIUM	Leuze electronic nv/sa MACHELEN	AUSTRIA	NIGERIA
BRAZIL	Leuze electronic Ltda. SAO PAULO	BULGARIA	NORWAY
CHINA	Leuze electronic Trading Co. Ltd. SHENZHEN	CHILE	PHILIPPINES
DENMARK	Leuze electronic Scandinavia ApS ALLEROED	COLUMBIA	POLAND
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SWEDEN	Leuze electronic Scandinavia ApS ALLEROED	INDONESIA	SLOVENIA
SWITZERLAND	Leuze electronic AG HÜNENBERG	ISRAEL	SOUTH AFRICA
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SOUTH KOREA	Leuze electronic Co., Ltd. ANYANG-SHI, KYUNGGI-DO	KENYA	THAILAND
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USA, CANADA	Leuze electronic, Inc. NEW HUDSON, MI	MACEDONIA	UNITED ARAB EMIRATES
		MALAYSIA	VIETNAM

Product selector

Product selection using technical features with part comparison list

Downloads

Download of technical documentation, 3D-CAD drawings and software

Combination products

Display of combination products such as transmitter and receiver

Industry solutions

Concrete suggestions for solving industry-specific tasks

www.leuze.com

Contact and support

Quick access to application advice and commissioning support

Technical features

Product detail pages with all technical features

Machine Safety Services

Extensive information on Machine Safety Services

Matching accessories

Display of similar products and matching accessories

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains














Protective
Sensors

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SERIES SELECTION TABLE, CUBIC

 Series		Dimensions in mm (WxHxD)	Housing material		Operating principle	Typ. op. range limit	Light source		
			Plastic	Metal			Infrared light	Red light	Laser
	2	8 x 23 x 12	●		Throughbeam sensor	0 ... 2m		●	
					Retro-reflective sensor	0.05 ... 3.1 m		●	
					Diff. refl. scanner with backgr. suppr.	15 / 30 / 50mm		●	
	3B	11 x 32 x 17	●		Throughbeam sensor	0 ... 10m		●	
					Retro-reflective sensor	0 ... 6m		●	●
					Diffuse reflection scanners	0 ... 750mm		●	
					Diff. refl. scanner with backgr. suppr.	5 ... 400mm		●	
	5	14 x 33 x 20	●		Throughbeam sensor	0 ... 15m		●	
					Retro-reflective sensor	0.02 ... 6m		●	
	53	14 x 54 x 20		●	Throughbeam sensor	0 ... 10m		●	
					Retro-reflective sensor	0 ... 5m		●	●
					Diff. refl. scanner with backgr. suppr.	5 ... 400mm		●	
	55	14 x 36 x 25		●	Throughbeam sensor	0 ... 10m		●	
					Retro-reflective sensor	0.02 ... 6m		●	●
					Diff. refl. scanner with backgr. suppr.	5 ... 400mm		●	
	25B	15 x 39 x 29	●		Throughbeam sensor	0 ... 24m		●	
					Retro-reflective sensor	0.05 ... 15m		●	●
					Diffuse reflection scanners	5 ... 800mm		●	
					Diff. refl. scanner with backgr. suppr.	0 ... 1000mm	●	●	
	28	15 x 47 x 32	●		Throughbeam sensor	0 ... 15m		●	
					Retro-reflective sensor	0.02 ... 6m		●	
	18	15 x 50 x 33		●	Retro-reflective sensor	0 ... 5m		●	
	8	15 x 48 x 38		●	Throughbeam sensor	0 ... 100m		●	●
					Retro-reflective sensor	0 ... 22m		●	●
					Diffuse reflection scanners	5 ... 800mm		●	
					Diff. refl. scanner with backgr. suppr.	5 ... 400mm		●	●
	95	17 x 66 x 35		●	Throughbeam sensor	0 ... 20m	●	●	
					Retro-reflective sensor	0 ... 9m		●	
					Diffuse reflection scanners	10 ... 900mm	●	●	
					Diff. refl. scanner with backgr. suppr.	20 ... 500mm	●	●	
	46B	18 x 75 x 43	●		Throughbeam sensor	0 ... 60m		●	
					Retro-reflective sensor	0.05 ... 18m		●	
					Diffuse reflection scanners	30 ... 1100mm		●	
					Diff. refl. scanner with backgr. suppr.	0 ... 2500mm	●	●	●
	96	30 x 90 x 70	●	●	Throughbeam sensor	0 ... 150m	●	●	
					Retro-reflective sensor	0 ... 28m	●	●	
					Diffuse reflection scanners	20 ... 1200mm	●	●	
					Diff. refl. scanner with backgr. suppr.	10 ... 6500/25000mm	●	●	●

SWITCHING OPTICAL SENSORS

Photoel. sensors/
light scanners,
cubic housing

Max. switching frequency	Response time	Special object features			Resistance in industrial environment			Protection class	Page
		Shiny surface (metallic, foil coated object)	Transparent medium (glass, PET, foil)	Small part	High insensitivity towards soiling / performance reserve	Temperatures < -35 °C			
385Hz	1.3ms			●			IP 67	20	
700Hz	0.72ms			●			IP 67		
700Hz	0.72ms	●		●			IP 67		
1000Hz	0.5ms				●		IP 67	32	
1000Hz	0.5ms	●	●	●	●		IP 67		
1000Hz	0.5ms						IP 67		
1000Hz	0.5ms	●		●			IP 67		
500Hz	1ms				●	●	IP 67		
500Hz	1ms				●	●	IP 67		
1000Hz	0.5ms				●		IP 67, IP 69K	138	
2000Hz	0.25ms		●	●	●		IP 67, IP 69K		
1000Hz	0.5ms	●					IP 67, IP 69K		
1000Hz	0.5ms				●		IP 67, IP 69K	152	
2000Hz	0.25ms		●	●	●		IP 67, IP 69K		
1000Hz	0.5ms	●		●			IP 67, IP 69K		
500Hz	1ms				●		IP 67, IP 66	88	
2000Hz	0.25ms	●	●	●	●		IP 67, IP 66		
500Hz	1ms				●		IP 67, IP 66		
1000Hz	0.5ms	●		●	●		IP 67, IP 66		
500Hz	1ms				●	●	IP 67		
500Hz	1ms				●	●	IP 67		
1500Hz	0.33ms		●	●			IP 67, IP 69K	84	
2800Hz	0.18ms			●		● ¹⁾	IP 67, IP 69K	70	
2800Hz	0.18ms		●	●		● ¹⁾	IP 67, IP 69K		
1500Hz	0.33ms					● ¹⁾	IP 67, IP 69K		
2000Hz	0.25ms	●		●		● ¹⁾	IP 67, IP 69K		
1000Hz	0.5ms						IP 67, IP 69K	168	
1000Hz	0.5ms		●	●			IP 67, IP 69K		
1000Hz	0.5ms						IP 67, IP 69K		
1000Hz	0.5ms	●					IP 67, IP 69K		
500Hz	1ms				●	●	IP 67, IP 69K	120	
500Hz	1ms	●			●	●	IP 67, IP 69K		
500Hz	1ms				●	●	IP 67, IP 69K		
1000Hz	0.5ms	●		●	●	●	IP 67, IP 69K		
500Hz	1ms				●	●	IP 67, IP 69K ²⁾	176	
1000Hz	0.5ms		●		●	●	IP 67, IP 69K ²⁾		
1000Hz	0.5ms				●	●	IP 67, IP 69K ²⁾		
300Hz	1.67ms	●			●	●	IP 67, IP 69K ²⁾		

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors









Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

	Series	Dimensions in mm (WxHxD)	Housing material		Typ. op. range limit [m]					
			Plastic	Metal	10	25	50	100	150	
	2	8 x 23 x 12	●		0 2					
	3B	11 x 32 x 17	●		0 8.5					
	5	14 x 33 x 20	●		0 15					
	53	14 x 54 x 20		●	0 10					
	55	14 x 36 x 25		●	0 10					
	25B	15 x 39 x 29	●		0 24					
	28	15 x 47 x 32	●		0 15					

THROUGHBEAM SENSORS, CUBIC

Photoel. sensors/
light scanners,
cubic housing

	Light source			Switching output/ Operating voltage						Connection						Page
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector	
		●		●	●								●	●	●	20
		●		●						●			●	●		32
		●		●	●					●			●		●	64
		●				●				●						138
		●				●				●					●	152
		●		●		●				●	●		●	●	●	88
		●		●	●						●		●			114

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors







Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

 Series	Dimensions in mm (Ø x L)	Housing material		Typ. op. range limit [m]				
		Plastic	Metal	10	25	50	100	150
 18	15 x 50 x 33							
 8	15 x 48 x 38		●	0 — 100				
 95	17 x 66 x 35		●	0 — 20				
 46B	18 x 75 x 43	●		0 — 60				
 96	30 x 90 x 70	●	●	0 — 150				

We reserve the right to make changes • Auswah_Kub_LS2_EN.fm

THROUGHBEAM SENSORS, CUBIC

Photoel. sensors/
light scanners,
cubic housing

	Light source			Switching output/ Operating voltage						Connection						Page	
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector		
		●	●	●	●	●					●		●				70
	●	●		●							●						168
		●				●					●		●		●		120
	●	●		●	●				●		●	●					176

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors









Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

 Series	Dimensions in mm (WxHxD)	Housing material		Typ. op. range limit [m]				
		Plastic	Metal	2	5	16	20	30
 2	8 x 23 x 12	●		0.05	4			
 3B	11 x 32 x 17	●		0.02	6			
 5	14 x 33 x 20	●		0.02	6			
 53	14 x 54 x 20		●	0	5			
 55	14 x 36 x 25		●	0.02	6			
 25B	15 x 39 x 29	●		0	15			
 28	15 x 47 x 32	●		0.02	6			

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RETRO-REFLECTIVE SENSORS, CUBIC

Photoel. sensors/
light scanners,
cubic housing

	Light source			Switching output/ Operating voltage						Connection						Page
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector	
		●		●	●								●	●	●	20
	●	●	●	●	●	●				●			●	●	●	32
		●		●	●					●			●		●	64
		●	●			●				●				●		138
		●	●			●				●					●	152
		●	●	●		●				●	●		●	●	●	88
		●		●	●						●		●			114

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors






Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

Series	Dimensions in mm (Ø x L)	Housing material		Typ. op. range limit [m]					
		Plastic	Metal	2	5	16	21	30	
 18	15 x 50 x 33		●	0	5				
 8	15 x 48 x 38		●	0				22	
 95	17 x 66 x 35		●	0	9				
 46B	18 x 75 x 43	●		0.05				18	
 96	30 x 90 x 70	●	●	0					28

We reserve the right to make changes • Auswah_Kub_PRK2_EN.fm

RETRO-REFLECTIVE SENSORS, CUBIC

Photoel. sensors/
light scanners,
cubic housing

	Light source			Switching output/ Operating voltage						Connection						Page
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector	
		●		●	●					●	●		●			84
		●	●	●	●	●					●		●			70
		●		●	●						●					168
		●		●		●		●			●		●		●	120
	●	●		●	●				●		●	●				176

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors








Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

Series	Dimensions in mm (WxHxD)	Housing material		Typ. scan range limit [mm]			
		Plastic	Metal	500	1000	2500	5500
 2	8 x 23 x 12	●		15 30 50			
 3B	11 x 32 x 17	●		10	750		
 5	14 x 33 x 20						
 53	14 x 54 x 20		●	5	400		
 55	14 x 36 x 25		●	5	400		
 25B	15 x 39 x 29	●		0	1000		
 28	15 x 47 x 32						

We reserve the right to make changes • Auswah_Kub_HRT1_EN.fm

DIFFUSE REFLECTION SCANNERS, CUBIC

Photoel. sensors/
light scanners,
cubic housing

	Light source			Switching output/ Operating voltage						Connection						Page
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector	
		●		●	●								●	●	●	20
		●		●	●	●				●			●	●	●	32
		●				●				●				●		138
		●				●				●					●	152
	●	●		●	●	●				●	●		●	●	●	88

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors







Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

 Series	Dimensions in mm (Ø x L)	Housing material		Typ. scan range limit [mm]			
		Plastic	Metal	500	1000	2500	6500
 18	15 x 50 x 33						
 8	15 x 48 x 38		●	5	800		
 95	17 x 66 x 35		●	0	900		
 46B	18 x 75 x 43	●		10	2500		
 96	30 x 90 x 70	●	●	20	6500/25000		

We reserve the right to make changes • Auswah_Kub_HRT2_EN.fm

DIFFUSE REFLECTION SCANNERS, CUBIC



Photoel. sensors/
light scanners,
cubic housing

Page	Light source			Switching output/ Operating voltage						Connection						
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector	
70		●	●	●	●	●					●		●			
168	●	●		●	●						●					
120	●	●	●	●		●		●			●		●		●	
176	●	●	●	●	●	●			●		●	●				

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

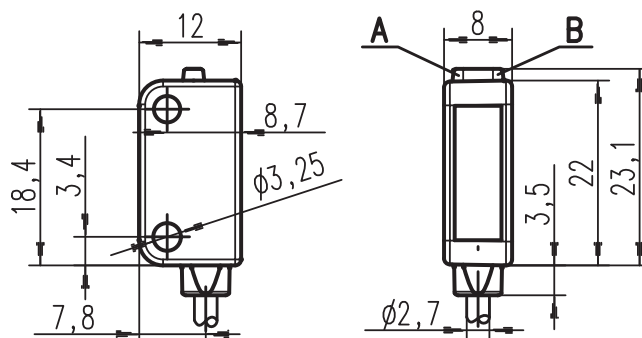
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW

Dimensioned drawing






- A** Yellow indicator diode
- B** Green indicator diode

We reserve the right to make changes • BR2_Overview_EN.fm

2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

2 SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 — 2 m	22
 Retro-reflective sensors	0.05 — 4 m	24
 Diffuse reflection scanners	15 / 30 / 50 mm permanent	26



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 20\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2V) / \leq 2V$
Indicators	Green LED	Ready to operate
	Flashing green LED	Overload - output
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Plastic (TPE)
	Optics cover	Plastic (PC)
	Weight (connector/cable)	20g/50g
Environmental data	Ambient temperature (operation)	$-20^\circ\text{C} \dots +55^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2

Mounting systems for this series can be found from page 634 onwards

Features

- Miniature sensors with visible red light
- Homogeneous, highly visible light spot by means of pin-point LED
- Universal connection options
- Temperature-stable plastic housing with inlaid metal attachment sleeves for secure mounting



Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690

THROUGHBEAM SENSORS

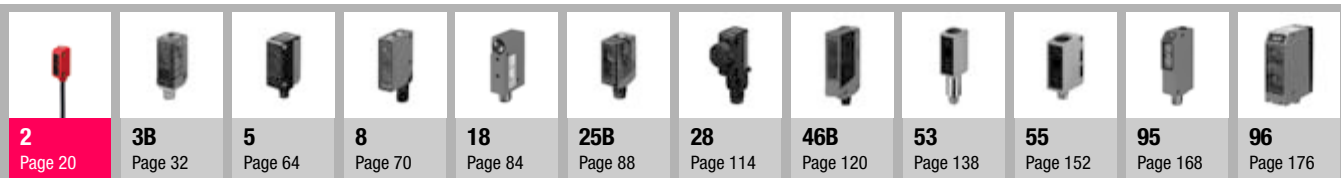
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors ▶ = Transmitter ◀ = Receiver						
▶ LSSR 2 ◀ LSER 2/42	50112127 50112130	<input type="text" value="0"/> <input type="text" value="1.6"/> <input type="text" value="0"/> <input type="text" value="2"/>	385Hz	Red light	1 x PNP 1 x NPN	Light
▶ LSSR 2.8, 150 - S8.3 ◀ LSER 2/4, 150 - S8.3	50116172 50116173	<input type="text" value="0"/> <input type="text" value="1.6"/> <input type="text" value="0"/> <input type="text" value="2"/>	385Hz	Red light	1 x PNP	Light
▶ LSSR 2, 150 - S8 ◀ LSER 2/42, 150 - S8	50112128 50112131	<input type="text" value="0"/> <input type="text" value="1.6"/> <input type="text" value="0"/> <input type="text" value="2"/>	385Hz	Red light	1 x PNP 1 x NPN	Light
▶ LSSR 2, 150 - S12 ◀ LSER 2/42, 150 - S12	50112129 50112132	<input type="text" value="0"/> <input type="text" value="1.6"/> <input type="text" value="0"/> <input type="text" value="2"/>	385Hz	Red light	1 x PNP 1 x NPN	Light
▶ LSSR 2 ◀ LSER 2/42D	50112127 50112133	<input type="text" value="0"/> <input type="text" value="1.6"/> <input type="text" value="0"/> <input type="text" value="2"/>	385Hz	Red light	1 x PNP 1 x NPN	Dark
▶ LSSR 2, 150 - S8 ◀ LSER 2/42D, 150 - S8	50112128 50112134	<input type="text" value="0"/> <input type="text" value="1.6"/> <input type="text" value="0"/> <input type="text" value="2"/>	385Hz	Red light	1 x PNP 1 x NPN	Dark
▶ LSSR 2, 150 - S12 ◀ LSER 2/42D, 150 - S12	50112129 50112135	<input type="text" value="0"/> <input type="text" value="1.6"/> <input type="text" value="0"/> <input type="text" value="2"/>	385Hz	Red light	1 x PNP 1 x NPN	Dark

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR2_LSR_EN.fm



2 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
Cable, 2 m	1		
Cable, 0.15 m, with M8 connector		a, b	
Cable, 0.15 m, with M8 connector	1	c, d	
Cable, 0.15 m, with M12 connector	1	e, f	
Cable, 2 m	1		
Cable, 0.15 m, with M8 connector	1	c, d	
Cable, 0.15 m, with M12 connector	1	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

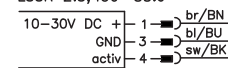
Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

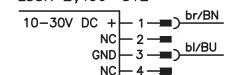
Inductive
Switches

Electrical connection

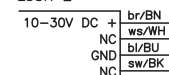
LSSR 2.8, 150-S8.3



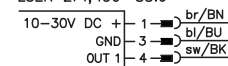
LSSR 2, 150-S8
LSSR 2, 150-S12



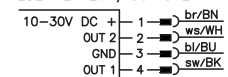
LSSR 2



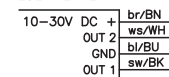
LSER 2/4, 150-S8.3



LSER 2/42..., 150-S8
LSER 2/42..., 150-S12



LSER 2/42...



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Options





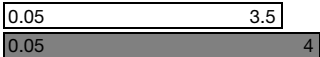

- 1 UL Recognized Component Mark

Light
Curtains

Protective
Sensors

www.leuze.com/en/2series/

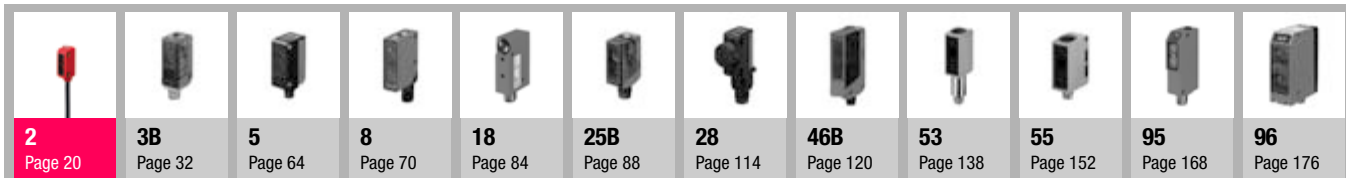
RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 2 / 42 50112136		<input type="checkbox"/>	700Hz	Red light	1 x PNP 1 x NPN	Light
PRK 2 / 42, 150 - S8 50112137		<input type="checkbox"/>	700Hz	Red light	1 x PNP 1 x NPN	Light
PRK 2 / 42, 150 - S12 50112138		<input type="checkbox"/>	700Hz	Red light	1 x PNP 1 x NPN	Light
PRK 2 / 42D 50112139		<input type="checkbox"/>	700Hz	Red light	1 x PNP 1 x NPN	Dark
PRK 2 / 42D, 150 - S8 50112140		<input type="checkbox"/>	700Hz	Red light	1 x PNP 1 x NPN	Dark
PRK 2 / 42D, 150 - S12 50112141		<input type="checkbox"/>	700Hz	Red light	1 x PNP 1 x NPN	Dark

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

We reserve the right to make changes • BR2_PPR1_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC	
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC	
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	



2 SERIES

Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
Cable, 2 m	1		
Cable, 0.15 m, with M8 connector	1	a, b, c, d	
Cable, 0.15 m, with M12 connector	1	e, f	
Cable, 2 m	1		
Cable, 0.15 m, with M8 connector	1	a, b, c, d	
Cable, 0.15 m, with M12 connector	1	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

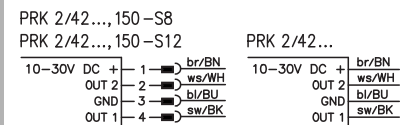
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains



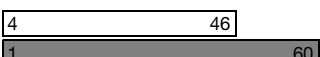

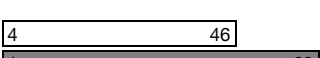

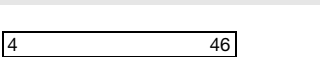
Protective
Sensors

Options

- | | |
|---|------------------------------|
| 1 | UL Recognized Component Mark |
|---|------------------------------|

www.leuze.com/en/2series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] <input type="checkbox"/> Typ. scan range limit [mm] <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression					
HRTR 2 / 42 - 50F 50112121		700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 2 - 50F, 150 - S8.3 50120855		700Hz	Red light	1 x NPN	Light
HRTR 2 / 42 - 50F, 150 - S8 50112122		700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42 - 50F, 150 - S12 50112123		700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42D - 50F 50112124		700Hz	Red light	1 x PNP 1 x NPN	Dark
HRTR 2 / 42D - 50F, 150 - S8 50112125		700Hz	Red light	1 x PNP 1 x NPN	Dark
HRTR 2 / 42D - 50F, 150 - S12 50112126		700Hz	Red light	1 x PNP 1 x NPN	Dark

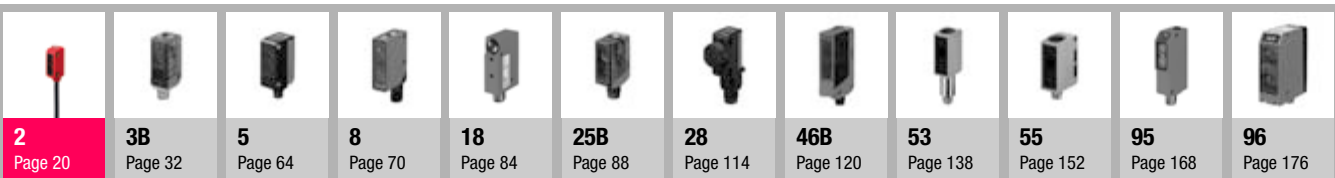
1) Measured against a white object with 90% diffuse reflection

We reserve the right to make changes • BR2_HRTR1_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



2 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 2 m	1, 2, 3		
Cable, 0.15 m, with M8 connector	1, 2, 3	a, b	
Cable, 0.15 m, with M8 connector	1, 2, 3	c, d	
Cable, 0.15 m, with M12 connector	1, 2, 3	e, f	
Cable, 2 m	1, 2, 3		
Cable, 0.15 m, with M8 connector	1, 2, 3	c, d	
Cable, 0.15 m, with M12 connector	1, 2, 3	e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

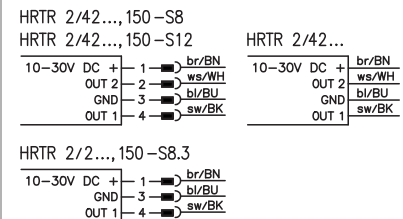
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range permanently set to 50mm
- 2 Laser-like, focused light spot: Ø 0.5mm @ 16mm, Ø 6.5mm @ 50mm
- 3 UL Recognized Component Mark

www.leuze.com/en/2series/

DIFFUSE REFLECTION SCANNERS

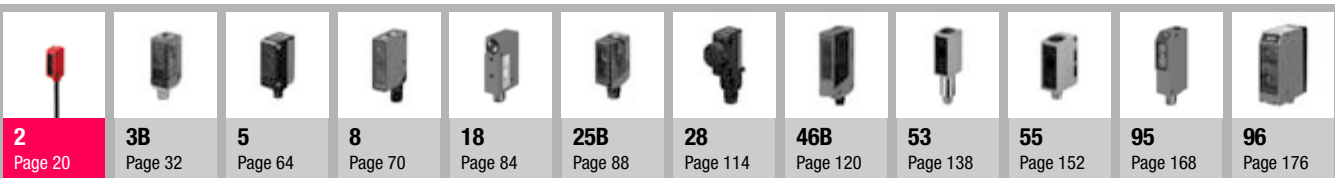
Part description Part No.:	Scanning range ¹⁾ [mm] <input type="checkbox"/> Typ. scan range limit [mm] <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression					
HRTR 2 / 42 - 30F 50112115		700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42 - 30F, 150 - S8 50112116		700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42 - 30F, 150 - S12 50112117		700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42D - 30F 50112118		700Hz	Red light	1 x PNP 1 x NPN	Dark
HRTR 2 / 42D - 30F, 150 - S8 50112119		700Hz	Red light	1 x PNP 1 x NPN	Dark
HRTR 2 / 42D - 30F, 150 - S12 50112120		700Hz	Red light	1 x PNP 1 x NPN	Dark

1) Measured against a white object with 90% diffuse reflection

We reserve the right to make changes • BR2_HRTR2_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



2 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 2 m	1, 2, 3		
Cable, 0.15 m, with M8 connector	1, 2, 3	a, b, c, d	
Cable, 0.15 m, with M12 connector	1, 2, 3	e, f	
Cable, 2 m	1, 2, 3		
Cable, 0.15 m, with M8 connector	1, 2, 3	a, b, c, d	
Cable, 0.15 m, with M12 connector	1, 2, 3	e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection

HRTR 2/42..., 150-S8

HRTR 2/42..., 150-S12

HRTR 2/42...

10-30V DC +	1	br/BN	10-30V DC +	br/BN
OUT 2	2	ws/WH	OUT 2	ws/WH
GND	3	bl/BU	GND	bl/BU
OUT 1	4	sw/BK	OUT 1	sw/BK

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range permanently set to 30mm
- 2 Laser-like, focused light spot: Ø 0.5mm @ 16mm, Ø 3mm @ 30mm
- 3 UL Recognized Component Mark

www.leuze.com/en/2series/

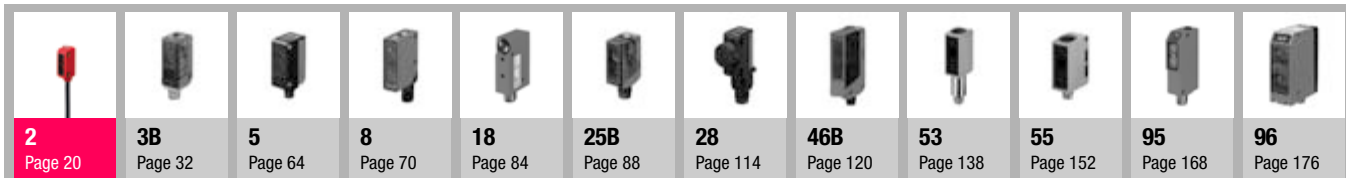
DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] <input type="checkbox"/> Typ. scan range limit [mm] <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression					
HRTR 2 / 42 - 15F 50112109	<input type="checkbox"/> 4 14 <input type="checkbox"/> 1 18	700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42 - 15F, 150 - S8 50112110	<input type="checkbox"/> 4 14 <input type="checkbox"/> 1 18	700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42 - 15F, 150 - S12 50112111	<input type="checkbox"/> 4 14 <input type="checkbox"/> 1 18	700Hz	Red light	1 x PNP 1 x NPN	Light
HRTR 2 / 42D - 15F 50112112	<input type="checkbox"/> 4 14 <input type="checkbox"/> 1 18	700Hz	Red light	1 x PNP 1 x NPN	Dark
HRTR 2 / 42D - 15F, 150 - S8 50112113	<input type="checkbox"/> 4 14 <input type="checkbox"/> 1 18	700Hz	Red light	1 x PNP 1 x NPN	Dark
HRTR 2 / 42D - 15F, 150 - S12 50112114	<input type="checkbox"/> 4 14 <input type="checkbox"/> 1 18	700Hz	Red light	1 x PNP 1 x NPN	Dark

1) Measured against a white object with 90% diffuse reflection

We reserve the right to make changes • BR2_HRTR3_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



2 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 2 m	1, 2, 3		
Cable, 0.15 m, with M8 connector	1, 2, 3	a, b, c, d	
Cable, 0.15 m, with M12 connector	1, 2, 3	e, f	
Cable, 2 m	1, 2, 3		
Cable, 0.15 m, with M8 connector	1, 2, 3	a, b, c, d	
Cable, 0.15 m, with M12 connector	1, 2, 3	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection

HRTR 2/42..., 150-S8		HRTR 2/42..., 150-S12		HRTR 2/42...	
10-30V DC +	1	br/BN	10-30V DC +	br/BN	br/BN
OUT 2	2	ws/WH	OUT 2	ws/WH	ws/WH
GND	3	bl/BU	GND	bl/BU	bl/BU
OUT 1	4	sw/BK	OUT 1	sw/BK	sw/BK

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range permanently set to 15mm
- 2 Laser-like, focused light spot: Ø 0.4mm @ 10mm, Ø 1.5mm @ 15mm
- 3 UL Recognized Component Mark

www.leuze.com/en/2series/

OVERVIEW



Product measurement

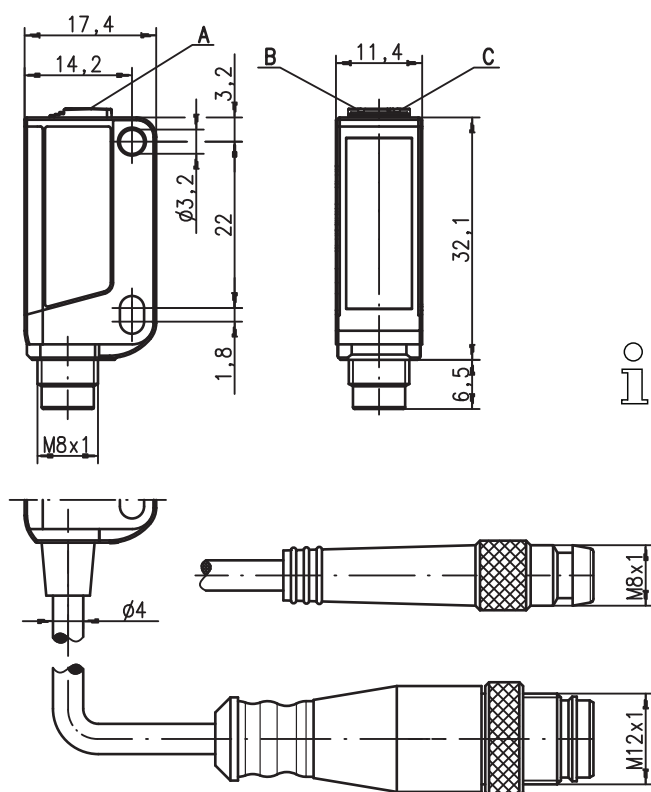


Circuit board detection



Container detection

Dimensioned drawing






Further details can be found in the respective data sheet.

- A** Green indicator diode
- B** Yellow indicator diode
- C** Operational control

We reserve the right to make changes • BR3_Overview_EN.fm

2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

3B SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 ... 10 m	34
 Retro-reflective sensors	0 ... 7 m	36
 Diffuse reflection scanners	0 ... 750 mm	48

Other 3B Series products:

 Contrast scanners	KRT... 3B	458
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Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 25\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Plastic
	Optics cover	Plastic (PMMA)
	Weight (connector/cable)	10g/40g
Environmental data	Ambient temperature (operation)	-25(-30)°C ... +55°C Laser: -10°C ... +55°C
	VDE safety class	II, all-insulated (cable) III (metal connector)
	Protection class	IP 67
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 629 onwards

Features

- Active ambient light suppression A²LS
- Application-specific, special solutions available: e.g. diffuse reflection scanner with elongated light spot
- Highest functional reliability
- Laser with autocollimation principle
- M8 metal connector



Optical Sensor

- | | |
|-------------------------------|----------|
| ● Throughbeam sensors | Page 689 |
| ● Retro-reflective sensors | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A ² LS | Page 697 |

THROUGHBEAM SENSORS

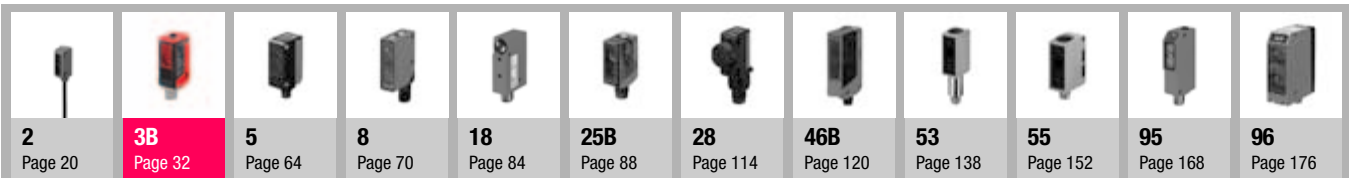
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors ▶ = Transmitter ◀ = Receiver						
▶ LSSR 3B.8 - S8 ◀ ILSER 3B/4 - S8	50108509 50108517		1000Hz	Red light	1xPNP/DC	Light
▶ LSSR 3B.8, 5000 ◀ LSER 3B/44.1, 5000	50108511 50111732		1000Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LSSR 3B.8, 200 - S8 ◀ ILSER 3B/4, 200 - S8	50108512 50108518		1000Hz	Red light	1xPNP/DC	Light
▶ LSSR 3B - S8 ◀ LSER 3B/66 - S8	50108508 50108514		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 3B.8 - S8 ◀ LSER 3B/66 - S8	50108509 50108514		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 3B - S8 ◀ LSER 3B/66.1 - S8	50108508 50108515		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 3B.8 ◀ LSER 3B/66	50108510 50108516		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 3B.8, 5000 ◀ LSER 3B/66, 5000	50108511 50108519		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 3B, 200 - S12 ◀ LSER 3B/66, 200 - S12	50111440 50111442		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 3B.8, 200 - S12 ◀ LSER 3B/66, 200 - S12	50111441 50111442		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR3_LSR_EN.fm



3B SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M8 connector	2, 3, 4	a, b, c, d	
Cable, 5 m	1, 2, 4		
Cable, 0.2m, with M8 connector	2, 3, 4	a, b, c, d	
M8 connector	4	a, b, c, d	
M8 connector	2, 4	a, b, c, d	
M8 connector	1, 4	a, b, c, d	
Cable, 2 m	2, 4		
Cable, 5 m	2, 4		
Cable, 0.2m, with M12 connector	4	e, f	
Cable, 0.2m, with M12 connector	2, 4	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

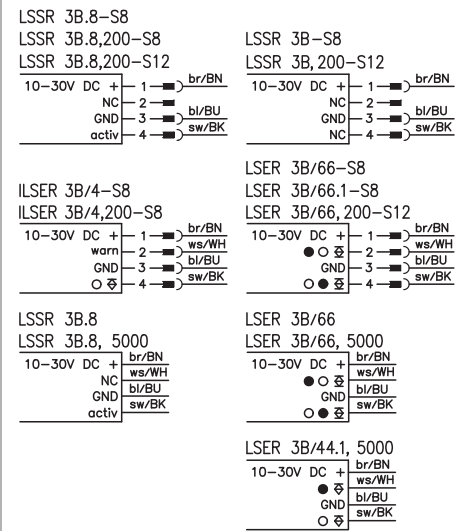
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Transmitter with activation input
- 3 Receiver with warning output
- 4 UL approval (class 2 acc. to NEC)

Light
Curtains

Protective
Sensors

www.leuze.com/en/3series/

RETRO-REFLECTIVE SENSORS

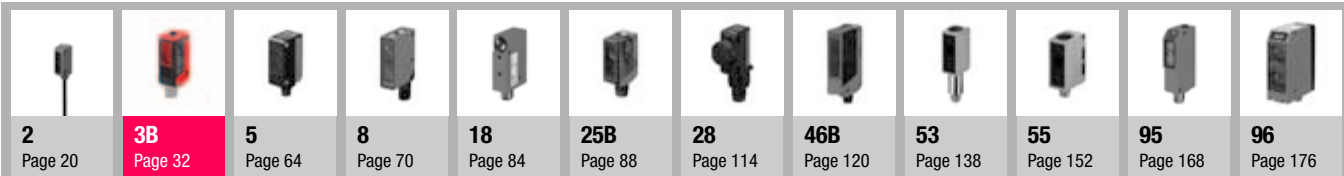
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors						
RKR 3B / 22D.01, 200 - S8 50113267	0.02 4 0.02 5		1500Hz	Red light	2xNPN/DC	Dark/light antivalent
RKR 3B / 66.11 50109023	0.02 6.5 0.02 7		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
RKR 3B / 6.42 - S8 50104703	0 1.5 0 1.8		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
RKR 3B / 6.42 50104702	0 1.5 0 1.8		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
RKR 3B / 6D.42 50107914	0 1.5 0 1.8		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
RKR 3B / 6.42, 200 - S8 50104704	0 1.5 0 1.8		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
RKR 3B / 6.42, 200 - S12 50105763	0 1.5 0 1.8		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
RK 3B / 66.1 50106852	0.02 4.5 0.02 5.5		1000Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR3_RKR_EN.fm



3B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
Cable, 0.2m, with M8 connector	3, 5	a, b, c, d	
Cable, 2m	3, 5		
M8 connector	1, 2, 4, 5	a, b, c, d	
Cable, 2m	1, 2, 4, 5		
Cable, 2m	1, 2, 4, 5		
Cable, 0.2m, with M8 connector	1, 2, 4, 5	a, b, c, d	
Cable, 0.2m, with M12 connector	1, 2, 4, 5	e, f	
Cable, 2m	3, 5		

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

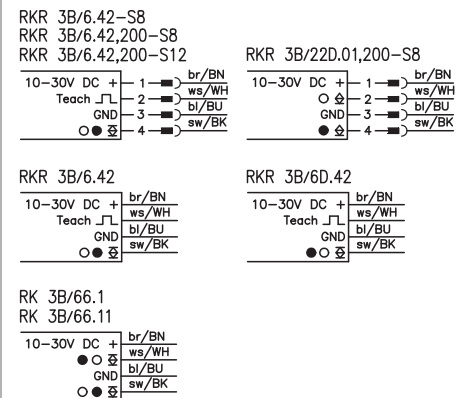
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Teach-in via teach button or teach input
- 2 Especially for transparent foils $\leq 20\mu\text{m}$
- 3 Shiny objects
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

www.leuze.com/en/3series/

RETRO-REFLECTIVE SENSORS

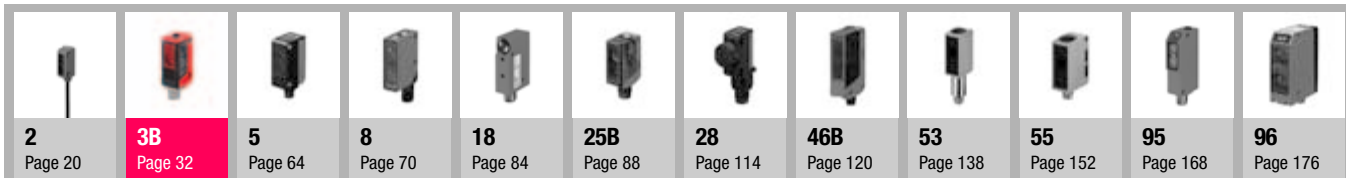
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 3B / 6.7 - S8 50104698	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
PRK 3B / 6D.7 - S8 50106865	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Dark
PRK 3B / 6.7 50104697	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
PRK 3B / 6 - S8.3 50109581	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
PRK 3B / 66 - S8 50104694	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 3B / 66 50104693	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 3B / 66, 200 - S8 50104695	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 3B / 66, 200 - S12 50104696	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 3B / 66.1 - S8 50106078	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 3B / 66.1 50118016	0.02 5 0.02 6	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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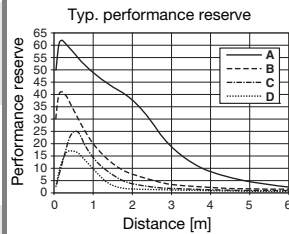


3B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	2, 3, 4	a, b	
M8 connector	2, 3, 4	a, b	
Cable, 2m	2, 4		
M8 connector	3, 4	a, b	
M8 connector	4	c, d	
Cable, 2m	4		
Cable, 0.2m, with M8 connector	4	c, d	
Cable, 0.2m, with M12 connector	4	e, f	
M8 connector	1, 4	c, d	
Cable, 2m	1, 4		



- A TK 100x100
- B TKS 40x60
- C TKS 20x40
- D Tape 4: 50x50

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

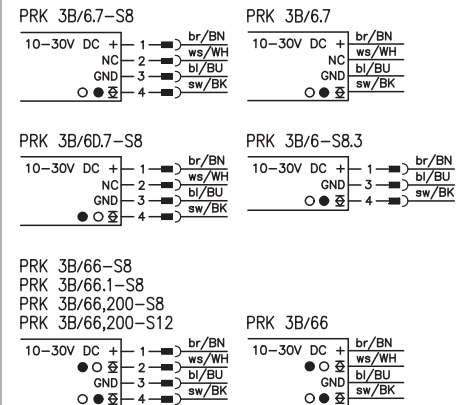
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input checked="" type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 3B / 4D.22, 200 - S8 50110775	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPNP/DC	Dark/light configurable
PRK 3B / 6.2 - S8.3 50109385	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.2, 200 - S8.3 50114099	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.22 - S8 50104700	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6D.22 - S8 50106418	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Dark/light configurable
PRK 3B / 6.22 50104699	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.22, 200 - S8 50104701	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.22, 200 - S12 50105762	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6D.46 50108026	<input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="5"/>		1000Hz	Red light	1xPush-pull/DC	Dark/light antivalent

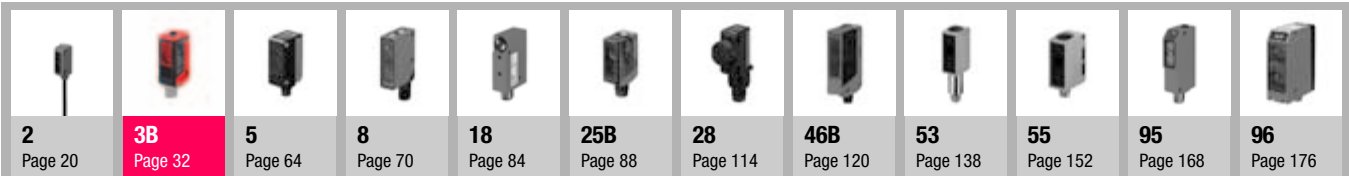
1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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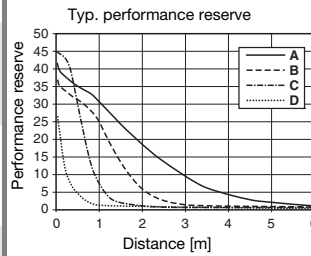


3B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
Cable, 0.2m, with M8 connector	2, 5, 6	c, d	
M8 connector	1, 5, 6	a, b	
Cable, 0.2m, with M8 connector	1, 5, 6	a, b	
M8 connector	2, 5, 6	c, d	
M8 connector	2, 5, 6	c, d	
Cable, 2m	2, 5, 6		
Cable, 0.2m, with M8 connector	2, 5, 6	c, d	
Cable, 0.2m, with M12 connector	2, 5, 6	e, f	
Cable, 2m	2, 3, 4, 5, 6,		



- A** TK 100x100
- B** TKS 40x60
- C** TKS 20x40
- D** Tape 4: 50x50



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

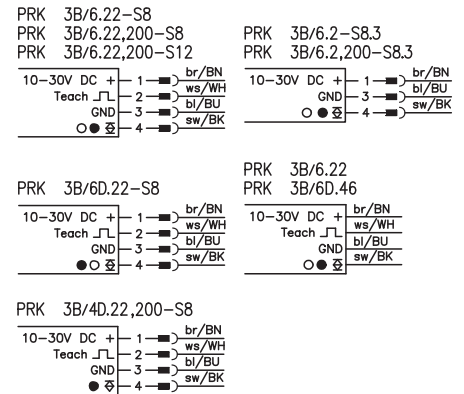
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Teach-in via teach button
- 2 Teach-in via teach button (lockable) or teach input
- 3 Transparent media (e.g. bottles)
- 4 AutoTeach - cyclical, automatic teach event
- 5 Autocollimation principle
- 6 UL approval (class 2 acc. to NEC)

www.leuze.com/en/3series/

RETRO-REFLECTIVE SENSORS

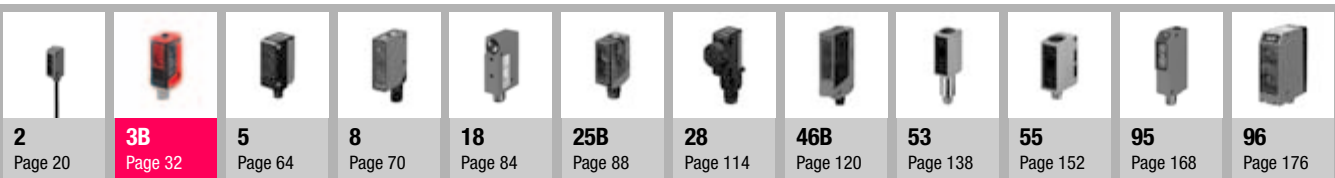
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input checked="" type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 3B / 6.42 - S8 50112473	<input type="text" value="0"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="3.6"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.42 50113327	<input type="text" value="0"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="3.6"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.42, 5000 50114873	<input type="text" value="0"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="3.6"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.42, 200 - S8 50113325	<input type="text" value="0"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="3.6"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6.42, 200 - S12 50113326	<input type="text" value="0"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="3.6"/>		1000Hz	Red light	1xPush-pull/DC	Light/dark configurable
PRK 3B / 6D.42 - S8 50112474	<input type="text" value="0"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="3.6"/>		1000Hz	Red light	1xPush-pull/DC	Dark/light configurable
PRK 3B / 6D.42, 200 - S12 50113324	<input type="text" value="0"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="3.6"/>		1000Hz	Red light	1xPush-pull/DC	Dark/light antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

We reserve the right to make changes • BR3_PRKB3_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

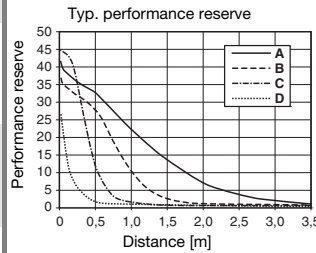


3B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	1, 2, 3, 4	a, b, c, d	
Cable, 2 m	1, 2, 3, 4		
Cable, 5 m	1, 2, 3, 4		
Cable, 0.2 m, with M8 connector	1, 2, 3, 4	a, b, c, d	
Cable, 0.2 m, with M12 connector	1, 2, 3, 4	e, f	
M8 connector	1, 2, 3, 4	a, b, c, d	
Cable, 0.2 m, with M12 connector	1, 2, 3, 4	e, f	



- A** TK 100x100
- B** TKS 40x60
- C** TKS 20x40
- D** Tape 4: 50x50



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

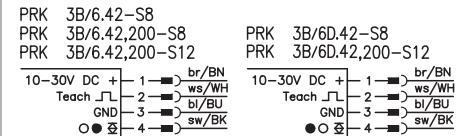
Ultrasonic
Sensors

Optical Sensor

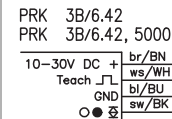
- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors



Special
Sensors

Options

- 1 Teach-in via teach button (lockable) or teach input
- 2 Highly transparent bottles (PET and glass)
- 3 Autocollimation principle
- 4 UL approval (class 2 acc. to NEC)

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

www.leuze.com/en/3series/

RETRO-REFLECTIVE SENSORS

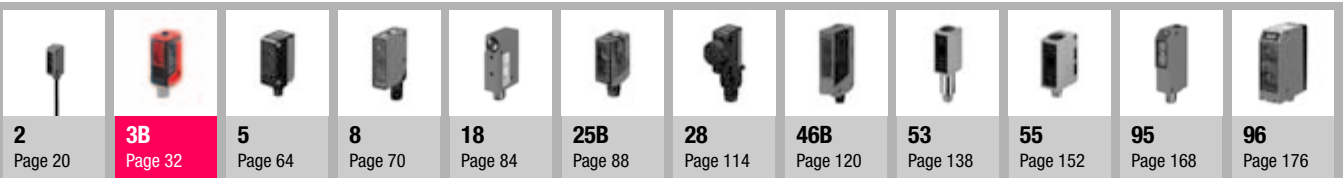
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective laser sensors with polarization filter						
PRKL 3B / 6.2 - S8.3 50109484	<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
PRKL 3B / 6D.22 - S8 50106475	<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Dark/light configurable
PRKL 3B / 6.22 - S8 50104706	<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
PRKL 3B / 6.22 50104705	<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
PRKL 3B / 6.2, 200 - S8.3 50114872	<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
PRKL 3B / 6.22, 200 - S8 50104707	<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
PRKL 3B / 6.22, 200 - S12 50105764	<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 676

We reserve the right to make changes • BR3_PRKB4_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



3B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	1, 3, 4	a, b	
M8 connector	2, 3, 4	c, d	
M8 connector	2, 3, 4	c, d	
Cable, 2 m	2, 3, 4		
Cable, 0.2 m, with M8 connector	2, 3, 4	a, b	
Cable, 0.2 m, with M8 connector	2, 3, 4	c, d	
Cable, 0.2 m, with M12 connector	2, 3, 4	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

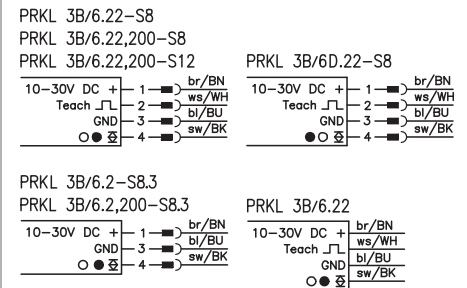
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Teach-in via teach button
- 2 Teach-in via teach button (lockable) or teach input
- 3 Autocollimation principle
- 4 UL approval (class 2 acc. to NEC)

www.leuze.com/en/3series/

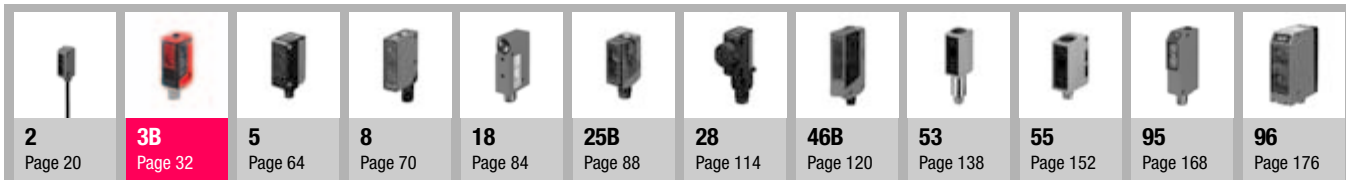
RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching		
Retro-reflective laser sensors with polarization filter								
PRKL 3B / 6.42 - S8 50115117	<table border="1"><tr><td>0 0.4</td></tr><tr><td>0 0.5</td></tr></table>	0 0.4	0 0.5	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
0 0.4								
0 0.5								
PRKL 3B / 6.42 50115116	<table border="1"><tr><td>0 0.4</td></tr><tr><td>0 0.5</td></tr></table>	0 0.4	0 0.5	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
0 0.4								
0 0.5								
PRKL 3B / 6.42, 200 - S8 50115118	<table border="1"><tr><td>0 0.4</td></tr><tr><td>0 0.5</td></tr></table>	0 0.4	0 0.5	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
0 0.4								
0 0.5								
PRKL 3B / 6.42, 200 - S12 50115119	<table border="1"><tr><td>0 0.4</td></tr><tr><td>0 0.5</td></tr></table>	0 0.4	0 0.5	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark configurable
0 0.4								
0 0.5								
PRKL 3B / 6.4 - S8.3 50120275	<table border="1"><tr><td>0 0.4</td></tr><tr><td>0 0.5</td></tr></table>	0 0.4	0 0.5	<input type="checkbox"/>	2000Hz	Red light laser class 1	PNP/DC	Light/dark configurable
0 0.4								
0 0.5								

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 676

We reserve the right to make changes • BR3_PPRKB5_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC	
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC	
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	



3B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	1, 2, 4, 5	c, d	
Cable, 2m	1, 2, 4, 5		
Cable, 0.2m, with M8 connector	1, 2, 4, 5	c, d	
Cable, 0.2m, with M12 connector	1, 2, 4, 5	e, f	
M8 connector	1, 3, 4, 5	a, b	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

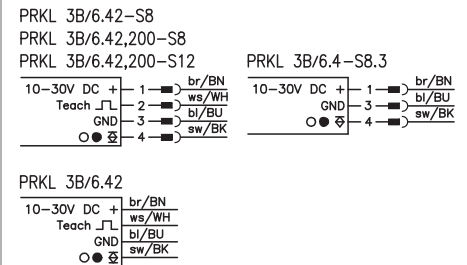
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Highly transparent bottles (PET and glass)
- 2 Teach-in via teach button (lockable) or teach input
- 3 Teach-in via teach button
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

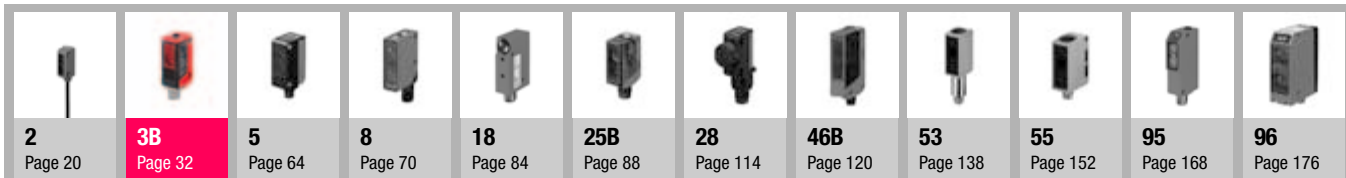
www.leuze.com/en/3series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners						
RTR 3B / 2.7 - S8 50109065			1000Hz	Red light	1xNPN/DC	Light
RTR 3B / 2.7 50109251			1000Hz	Red light	1xNPN/DC	Light
RTR 3B / 6.7 - S8 50109061			1000Hz	Red light	1xPush-pull/DC	Light
RTR 3B / 6.7 50109250			1000Hz	Red light	1xPush-pull/DC	Light
RTR 3B / 66 - S8 50108505			1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
RTR 3B / 66 50108506			1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR3_RTRB_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC	
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC	
c 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC	
d 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC	
e 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
f 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	



3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
M8 connector	1, 2, 3, 4	a, b	
Cable, 2 m	1, 2, 4		
M8 connector	1, 2, 3, 4	a, b	
Cable, 2 m	1, 2, 4		
M8 connector	1, 4	c, d, e, f	
Cable, 2 m	1, 4		



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

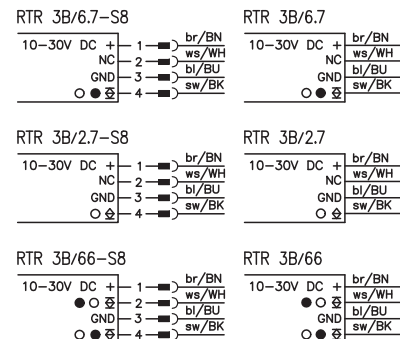
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Sensitivity adjustment
- 2 Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

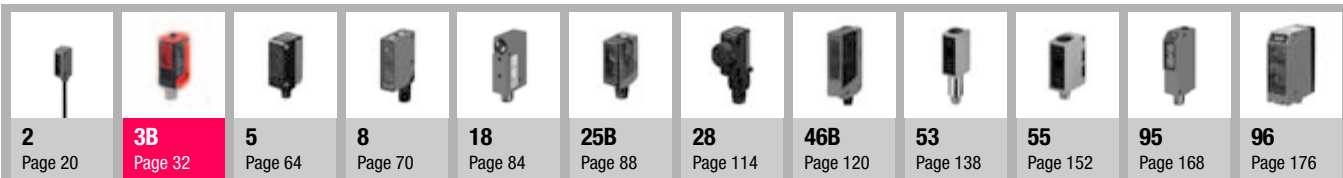
Part description Part No.:	Scanning range ¹⁾ [mm] <input type="checkbox"/> Typ. scan range limit [mm] <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression					
HRTR 3B / 4, 200 - S8.3 50107232	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	1xPNP/DC	Light
HRTR 3B / 44 - S8 50107233	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 44 50107235	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 44, 5000 50109753	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 44 - 95, 200 - S8 50112465	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 44 - 350, 200 - S8 50115262	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 44, 200 - S12 50107236	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 2.7 50107918	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	1xNPN/DC	Light
HRTR 3B / 22 - S8 50107239	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xNPN/DC	Light/dark antivalent
HRTR 3B / 22 50107238	<input type="checkbox"/> 5 200 <input type="checkbox"/> 5 400	1000Hz	Red light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR3_HRTRB1_EN.fm



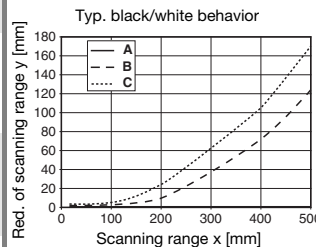
3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 6	a, b	
M8 connector	1, 6	c, d	
Cable, 2 m	1, 6		
Cable, 5 m	1, 6		
Cable, 0.2 m, with M8 connector	1, 4, 6	c, d	
Cable, 0.2 m, with M8 connector	1, 5, 6	c, d	
Cable, 0.2 m, with M12 connector	1, 6	e, f	
Cable, 2 m	1, 2, 3, 6		
M8 connector	1, 6	c, d	
Cable, 2 m	1, 6		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

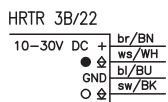
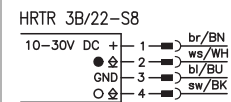
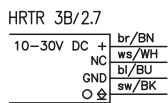
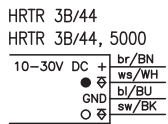
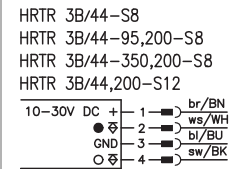
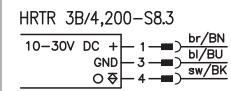
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

1) Typical scanning range with a black/white error < 10%

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Economy version (1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 Scanning range pre-set to 95 mm
- 5 Scanning range pre-set to 350 mm
- 6 UL approval (class 2 acc. to NEC)

www.leuze.com/en/3series/

DIFFUSE REFLECTION SCANNERS

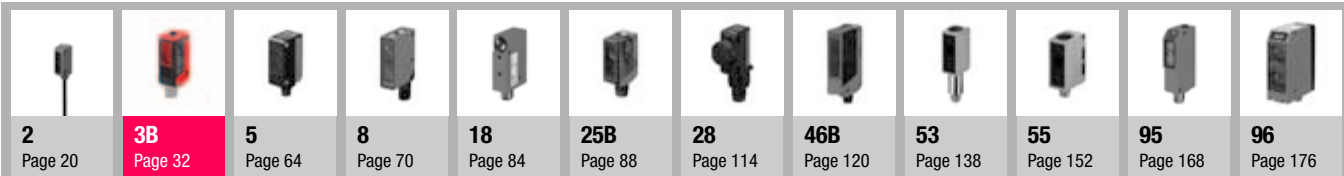
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection light scanners with fading						
RTFR 3B / 2.7 50108502	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	1xNPN/DC	Light
RTFR 3B / 6.7 - S8 50108497	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
RTFR 3B / 6D.7 - S8 50108500	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Dark
RTFR 3B / 6.7 50108501	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
RTFR 3B / 6 - S8.3 50108498	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
RTFR 3B / 6D - S8.3 50108499	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Dark
RTFR 3B / 66 - S8 50108495	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
RTFR 3B / 66 50108496	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
RTFR 3B / 66, 200 - S8 50108504	10 420 5 450	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR3_RTFRB_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
d 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
e 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
f 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC



3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
Cable, 2 m	1, 2, 4		< 50%
M8 connector	1, 2, 3, 4	c, d, e, f	< 50%
M8 connector	1, 2, 3, 4	c, d, e, f	< 50%
Cable, 2 m	1, 2, 4		< 50%
M8 connector	1, 4	a, b	< 50%
M8 connector	1, 4	a, b	< 50%
M8 connector	1, 4	c, d, e, f	< 50%
Cable, 2 m	1, 4		< 50%
Cable, 0.2 m, with M8 connector	1, 4	c, d, e, f	< 50%



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

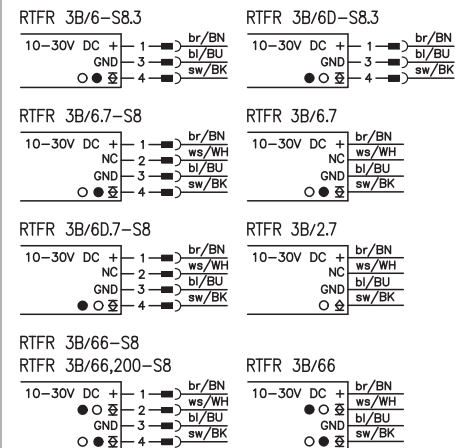
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Options

- 1 Sensitivity adjustment
- 2 Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)

Light
Curtains

Protective
Sensors

www.leuze.com/en/3series/

DIFFUSE REFLECTION SCANNERS

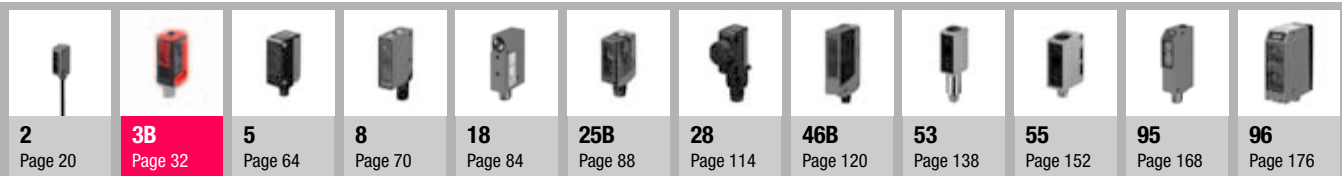
Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression					
HRTR 3B / 6.7 - S8 50107241		1000Hz	Red light	1xPush-pull/DC	Light
HRTR 3B / 6.7 50107240		1000Hz	Red light	1xPush-pull/DC	Light
HRTR 3B / 6D.7 50107922		1000Hz	Red light	1xPush-pull/DC	Dark
HRTR 3B / 6 - S8.3 50108408		1000Hz	Red light	1xPush-pull/DC	Light
HRTR 3B / 66 - S8 50107229		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 66 50107228		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 66, 200 - S8 50107230		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 66, 200 - S12 50107298		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR3_HRTRB2_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



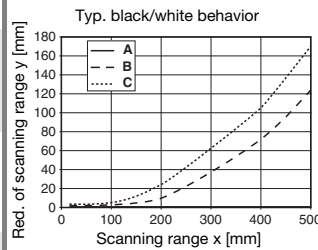
3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 3, 4	a, b	
Cable, 2m	1, 2, 3, 4		
Cable, 2m	1, 2, 3, 4		
M8 connector	1, 4	a, b	
M8 connector	1, 4	c, d	
Cable, 2m	1, 4		
Cable, 0.2m, with M8 connector	1, 4	c, d	
Cable, 0.2m, with M12 connector	1, 4	e, f	



1) Typical scanning range with a black/white error < 10%



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

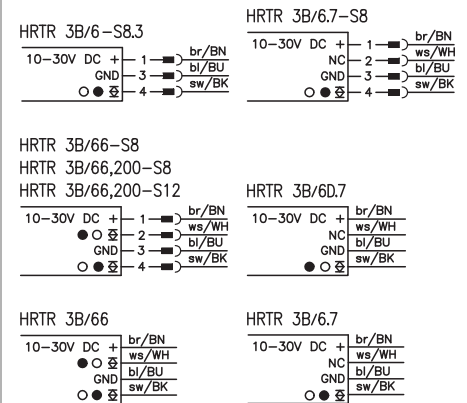
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

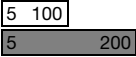
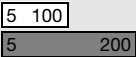
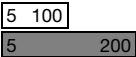
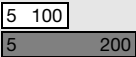
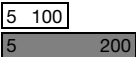
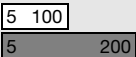
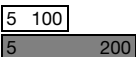
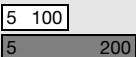


Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

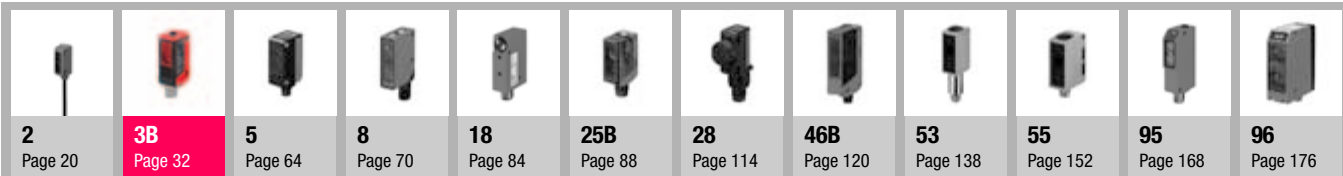
Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 3B / 44 - S 50109504		<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 6 - S - S8.3 50108407		<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
HRTR 3B / 6 - S, 200 - S8.3 50109051		<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
HRTR 3B / 66 - S - S8 50107243		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 66 - S 50107242		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 66 - S, 5000 50110809		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 66 - S, 200 - S8 50107244		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 66 - S, 200 - S12 50107245		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 3B / 44 - L - S8 50111443		<input type="checkbox"/>	150Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 3B / 44 - L, 200 - S8 50113317		<input type="checkbox"/>	150Hz	Red light	2xPNP/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR3_HRTRB3_EN.fm



3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 2m	1, 2, 4		
M8 connector	1, 2, 4	a, b	
Cable, 0.2m, with M8 connector	1, 2, 4	a, b	
M8 connector	1, 2, 4	c, d	
Cable, 2m	1, 2, 4		
Cable, 5m	1, 2, 4		
Cable, 0.2m, with M8 connector	1, 2, 4	c, d	
Cable, 0.2m, with M12 connector	1, 2, 4	e, f	
M8 connector	1, 3, 4	c, d	
Cable, 0.2m, with M8 connector	1, 3, 4	c, d	

1) Typical scanning range with a black/white error < 10%

Options

- Scanning range adjustment via multiturn potentiometer
- Small, homogeneous light spot for detecting small parts
- Broad rectangular light spot 3 x 33mm² (at a distance of 50mm) guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- UL approval (class 2 acc. to NEC)



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

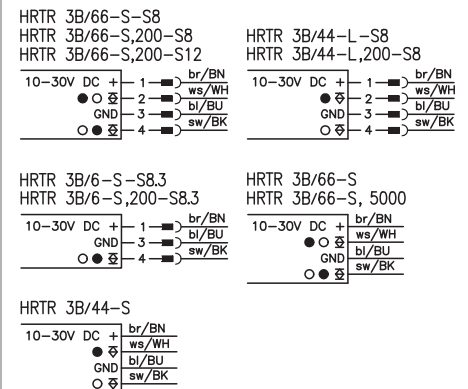
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Diffuse reflection scanners with background suppression										
HRTR 3B / 4 - XL - S8 50107299	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	1xPNP/DC	Light
5	60									
5	100									
HRTR 3B / 44 - XL - S8 50107250	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
5	60									
5	100									
HRTR 3B / 44 - XL, 200 - S12 50107251	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
5	60									
5	100									
HRTR 3B / 6 - XL - S8.3 50109485	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
5	60									
5	100									
HRTR 3B / 6D - XL - S8.3 50111444	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Dark
5	60									
5	100									
HRTR 3B / 66 - XL - S8 50107247	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
5	60									
5	100									
HRTR 3B / 66 - XL 50107246	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
5	60									
5	100									
HRTR 3B / 66 - XL, 200 - S8 50107248	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
5	60									
5	100									
HRTR 3B / 66 - XL, 200 - S12 50107249	<table border="1"><tr><td>5</td><td>60</td></tr><tr><td>5</td><td>100</td></tr></table>	5	60	5	100	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
5	60									
5	100									

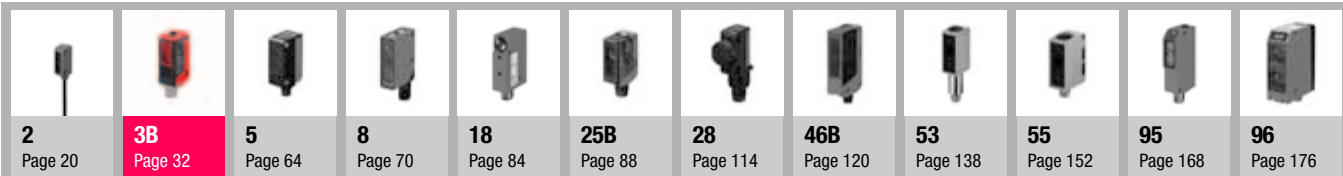
1) Typical scanning range with a black/white error < 10%

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR3_HRTRB4_EN.fm



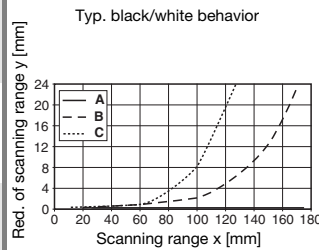
3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 3, 4	c, d	
M8 connector	1, 3, 4	c, d	
Cable, 0.2m, with M12 connector	1, 3, 4	e, f	
M8 connector	1, 3, 4	a, b	
M8 connector	1, 3, 4	a, b	
M8 connector	1, 3, 4	c, d	
Cable, 2 m	1, 3, 4		
Cable, 0.2m, with M8 connector	1, 3, 4	c, d	
Cable, 0.2m, with M12 connector	1, 3, 4	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

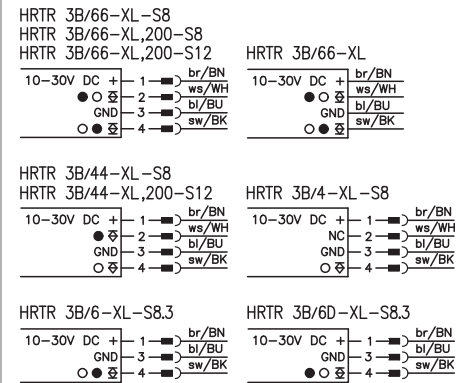
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Broad rectangular light spot 3 x 40mm² (at a distance of 50mm) guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 4 UL approval (class 2 acc. to NEC)

www.leuze.com/en/3series/

DIFFUSE REFLECTION SCANNERS

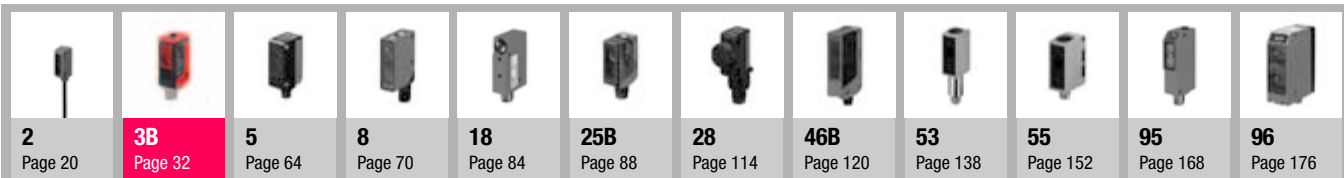
Part description Part No.:	Scanning range ¹⁾ [mm] <input type="checkbox"/> Typ. scan range limit [mm] <input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Diffuse reflection scanners with V-optics and background suppression									
HRTR 3B / 2.7 - V 50115641	<table border="1"><tr><td>15</td><td>200</td></tr><tr><td>15</td><td>200</td></tr></table>	15	200	15	200	1000Hz	Red light	1xNPN/DC	Light
15	200								
15	200								
HRTR 3B / 66 - V - S8 50114769	<table border="1"><tr><td>15</td><td>200</td></tr><tr><td>15</td><td>200</td></tr></table>	15	200	15	200	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
15	200								
15	200								
HRTR 3B / 66 - V 50114766	<table border="1"><tr><td>15</td><td>200</td></tr><tr><td>15</td><td>200</td></tr></table>	15	200	15	200	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
15	200								
15	200								
HRTR 3B / 66 - V, 200 - S8 50114767	<table border="1"><tr><td>15</td><td>200</td></tr><tr><td>15</td><td>200</td></tr></table>	15	200	15	200	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
15	200								
15	200								
HRTR 3B / 66 - V, 200 - S12 50114768	<table border="1"><tr><td>15</td><td>200</td></tr><tr><td>15</td><td>200</td></tr></table>	15	200	15	200	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
15	200								
15	200								
Diffuse reflection scanners with background suppression									
HRT 3B / 44 50110659	<table border="1"><tr><td>5</td><td>250</td></tr><tr><td>5</td><td>600</td></tr></table>	5	250	5	600	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
5	250								
5	600								

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104524	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR3_HRTRB5_EN.fm



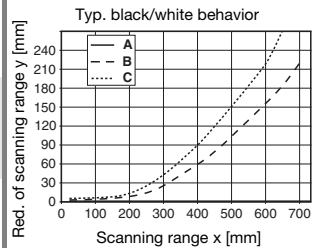
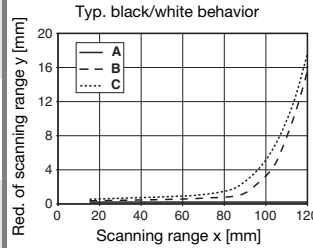
3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 2 m	1, 2, 3, 4, 5		
M8 connector	1, 2, 5	a, b, c, d	
Cable, 2 m	1, 2, 5		
Cable, 0.2 m, with M8 connector	1, 2, 5	a, b, c, d	
Cable, 0.2 m, with M12 connector	1, 2, 5	e, f	
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 2 m	1, %		



1) Typical scanning range with a black/white error < 10%

Options

- Scanning range adjustment via multiturn potentiometer
- V-optics for detection of very shiny, polished surfaces and transparent objects in a range of 30 ... 70
- Economy version (1 LED, without metal sleeve in housing)
- Direct connection to AS-interface I/O coupling modules
- UL approval (class 2 acc. to NEC)



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection

HRTR 3B/66-V-S8
HRTR 3B/66-V,200-S8
HRTR 3B/66-V,200-S12

10-30V DC +	1	br/BN	10-30V DC +	1	br/BN
● O	2	ws/WH	● O	2	ws/WH
○	3	bl/BU	○	3	bl/BU
○	4	sw/BK	○	4	sw/BK

HRTR 3B/2.7-V

10-30V DC +	br/BN
NC	ws/WH
● O	bl/BU
○	sw/BK

HRT 3B/44

10-30V DC +	br/BN
● O	ws/WH
○	bl/BU
○	sw/BK

Forked
Sensors

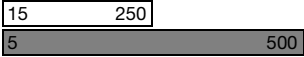
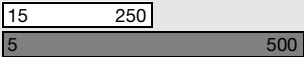
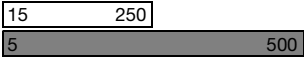
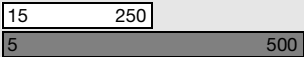
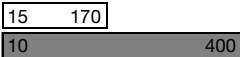
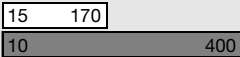
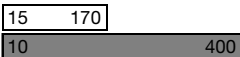
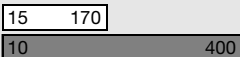
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

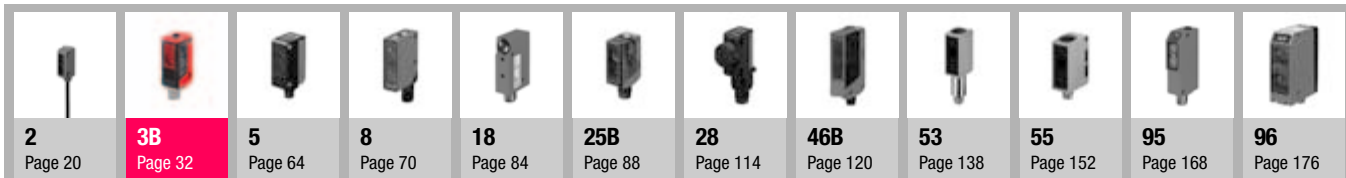
Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] <input type="checkbox"/> Typ. scan range limit [mm] <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection laser scanners with background suppression					
HRTL 3B / 66 - C2 - S8 50114582		2000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
HRTL 3B / 66 - C2 50114763		2000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
HRTL 3B / 66 - C2, 200 - S8 50114764		2000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
HRTL 3B / 66 - C2, 200 - S12 50114765		2000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
HRTL 3B / 66 - S8 50114581		2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent
HRTL 3B / 66 50114760		2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent
HRTL 3B / 66, 200 - S8 50114761		2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent
HRTL 3B / 66, 200 - S12 50114762		2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR3_HRTL3B_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



3B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 3	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2, 3		
Cable, 0.2m, with M8 connector	1, 2, 3	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 0.2m, with M12 connector	1, 2, 3	e, f	
M8 connector	1, 2, 3	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2, 3		
Cable, 0.2m, with M8 connector	1, 2, 3	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 0.2m, with M12 connector	1, 2, 3	e, f	

1) Typical scanning range with a black/white error < 10%



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection

HRTL 3B/66...-S8		HRTL 3B/66...,200-S8		HRTR 3B/66...	
HRTL 3B/66...,200-S12					
10-30V DC +	1	br/BN		10-30V DC +	br/BN
○ ⊗	2	ws/WH		○ ⊗	ws/WH
GND	3	bl/BU		GND	bl/BU
○ ⊗	4	sw/BK		○ ⊗	sw/BK

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

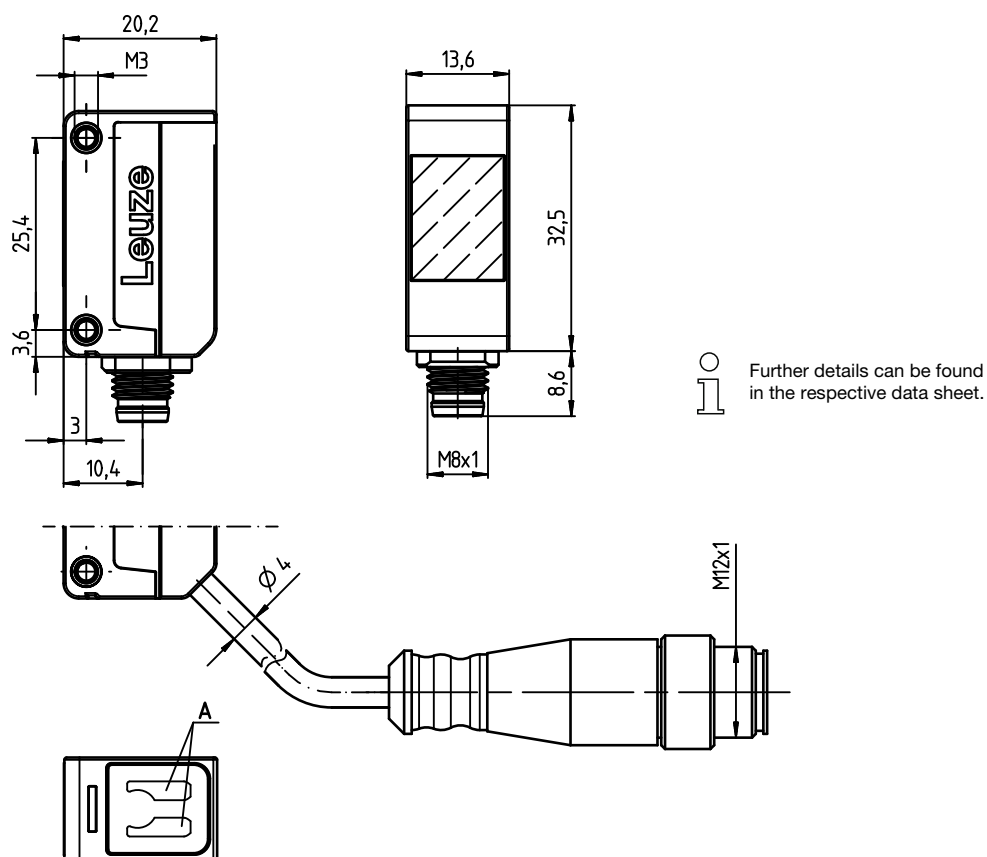
Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Collimated light beam propagation with small beam diameter of 1 mm
- 3 UL approval (class 2 acc. to NEC)

www.leuze.com/en/3series/













OVERVIEW

Dimensioned drawing





A Yellow/green indicator diodes

We reserve the right to make changes • BR5_Overview_EN.fm

											
2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

5 SERIES

Photoel. sensors/
light scanners,
cubic housing

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 ... 15 m	66
 Retro-reflective sensors	0.02 ... 6 m	68



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Common technical data		
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 20\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2.5\text{V}) / \leq 2.5\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Plastic
	Optics cover	Plastic
	Weight (connector/cable)	20g/70g
Environmental data	Ambient temperature (operation)	$-40^\circ\text{C} \dots +60^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2
	Certifications	for the North American market in preparation
Mounting systems for this series can be found from page 629 onwards		

Features

- Sensors with visible red light
- Fast alignment through *brightVision*[®]
- Complementary switching outputs for light/dark switching
- Temperature stable, sturdy plastic housing with inserted metal threaded sleeves for easy mounting



Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

THROUGHBEAM SENSORS

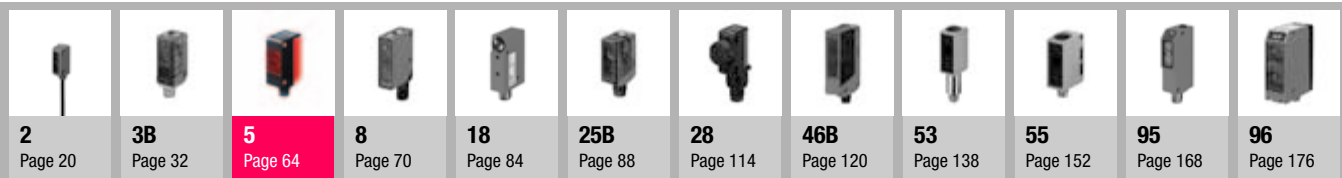
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors						
▶ = Transmitter ◀ = Receiver						
▶ LS 5/9D - M8 ◀ LE 5/4P - M8	50117695 50117692	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 5/9D ◀ LE 5/4P	50117694 50117691	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 5/9D - 200 - M12 ◀ LE 5/4P - 200 - M12	50117693 50117690	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 5/9D - M8 ◀ LE 5/2N - M8	50117695 50117689	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2 x NPN/DC	Light/dark antivalent
▶ LS 5/9D ◀ LE 5/2N	50117694 50117688	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2 x NPN/DC	Light/dark antivalent
▶ LS 5/9D - 200 - M12 ◀ LE 5/2N - 200 - M12	50117693 50117683	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2 x NPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR5_L_EN.fm



5 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M8 connector	1, 2, 3	a, b, c, d	
Cable, 2 m	1, 2, 3		
Cable, 0.2 m, with M12 connector	1, 2, 3	e, f	
M8 connector	1, 2, 3	a, b, c, d	
Cable, 2 m	1, 2, 3		
Cable, 0.2 m, with M12 connector	1, 2, 3	e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

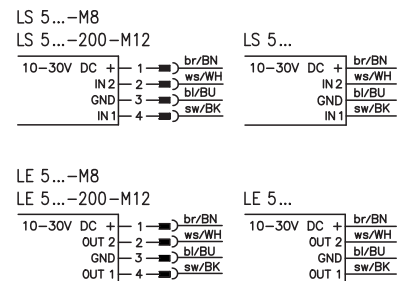
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Transmitter with two deactivation inputs (deact. with HIGH/LOW signal)
- 2 Fast alignment through *brightVision*
- 3 Certification for the North American market in preparation

www.leuze.com/en/5series/

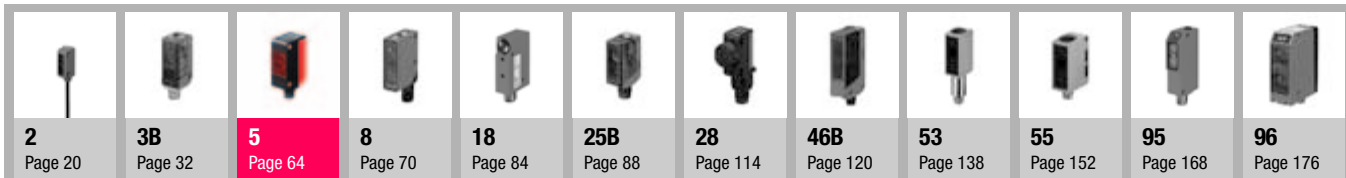
RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 5/4P - M8 50117706	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 5/4P 50117705	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 5/4P - 200 - M12 50117704	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 5/2N - M8 50117703	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2 x NPN/DC	Light/dark antivalent
PRK 5/2N 50117707	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2 x NPN/DC	Light/dark antivalent
PRK 5/2N - 200 - M12 50117702	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2 x NPN/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 677

We reserve the right to make changes • BR5_PRK_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC	
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC	
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	



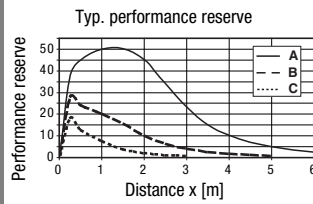
5 SERIES

Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	1, 2	a, b, c, d	
Cable, 2 m	1, 2		
Cable, 0.2 m, with M12 connector	1, 2	e, f	
M8 connector	1, 2	a, b, c, d	
Cable, 2 m	1, 2		
Cable, 0.2 m, with M12 connector	1, 2	e, f	



- A TKS 100x100
- B TKS 40x60
- C TKS 20x40



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

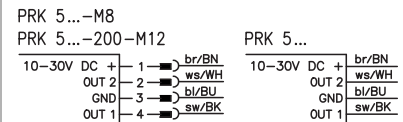
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Options

- 1 Fast alignment through *brightVision*
- 2 Certification for the North American market in preparation

Forked
Sensors

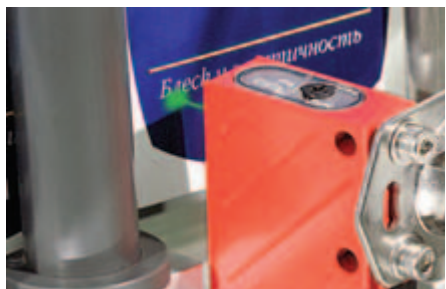
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

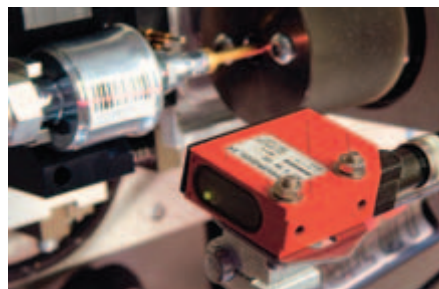
OVERVIEW



Mark detection

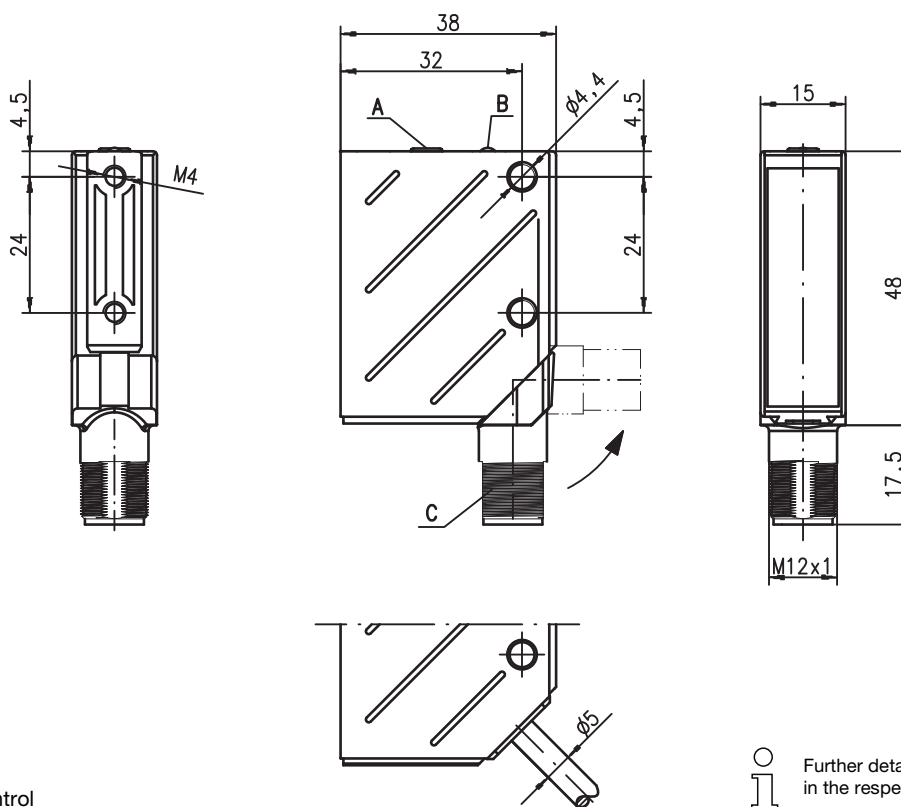


Extension control




Bar code reading













Dimensioned drawing






- A** Operational control
- B** Indicator diode
- C** 90° turning connector

 Further details can be found in the respective data sheet.

We reserve the right to make changes • BR8_Overview_EN.fm

											
2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

8 SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 <input type="text" value="100"/> m	72
 Retro-reflective sensors	0 <input type="text" value="20"/> m	74
 Diffuse reflection scanners	<input type="text" value="5"/> ... 800 mm	78

Other 8 Series products:

 Optical distance sensors	ODSL 8	268
 Luminescence scanners	LRT 8	496



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Metal
	Optics cover	Glass
	Weight (connector/cable)	70g/140g
Environmental data	Ambient temperature (operation)	-40°C ... +60°C Laser: -10°C ... +40°C
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 69K
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 629 onwards

Features

- Metal housing
- IP 67 and IP 69K
- Active ambient light suppression A²LS
- Interference-immune push-pull outputs
- Laser devices
- Expanded temperature range: -40°C to +60°C
- M12 turning connector



Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A²LS Page 697

THROUGHBEAM SENSORS

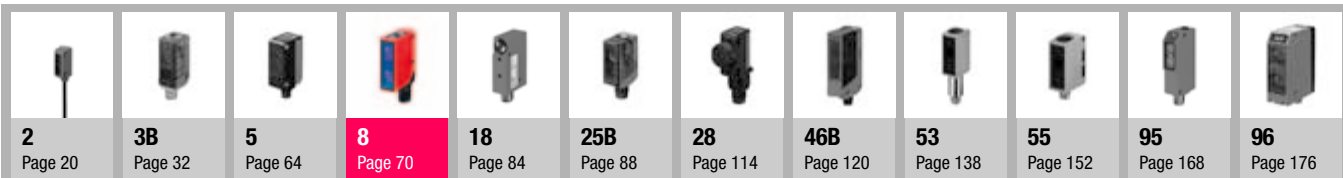
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors						
▶ = Transmitter ◀ = Receiver						
▶ LSSR 8 - S12 ◀ LSER 8 / 44 - S12	50036354 50036356	<input type="text" value="0"/> <input type="text" value="12"/> <input type="text" value="0"/> <input type="text" value="20"/>	1500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LSSR 8 ◀ LSER 8 / 44	50036355 50036357	<input type="text" value="0"/> <input type="text" value="12"/> <input type="text" value="0"/> <input type="text" value="20"/>	1500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LSSR 8 - S12 ◀ LSER 8 / 66 - S12	50036354 50036569	<input type="text" value="0"/> <input type="text" value="12"/> <input type="text" value="0"/> <input type="text" value="20"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 8 ◀ LSER 8 / 66	50036355 50036570	<input type="text" value="0"/> <input type="text" value="12"/> <input type="text" value="0"/> <input type="text" value="20"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
Throughbeam laser sensors						
▶ LSSRL 8.9 - S12 ◀ LSERL 8 / 24.01 - S12	50036358 50036359	<input type="text" value="0"/> <input type="text" value="60"/> <input type="text" value="0"/> <input type="text" value="100"/>	2800Hz	Laser class 2	PNP/DC NPN/DC	Light
▶ LSSRL 8.9 ◀ LSERL 8 / 24.01	50037083 50037084	<input type="text" value="0"/> <input type="text" value="60"/> <input type="text" value="0"/> <input type="text" value="100"/>	2800Hz	Laser class 2	PNP/DC NPN/DC	Light

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR8_LSR_EN.fm



8 SERIES

Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	3	a, b, c, d, e, f	
Cable, 2 m	3		
M12 connector	3	a, b, c, d, e, f	
Cable, 2 m	3		
M12 connector	1, 2, 3	a, b, c, d, e, f	<p>A Focus at 0.125m B Focus at 2m C Focus at 16m</p>
Cable, 2 m	1, 2, 3		

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

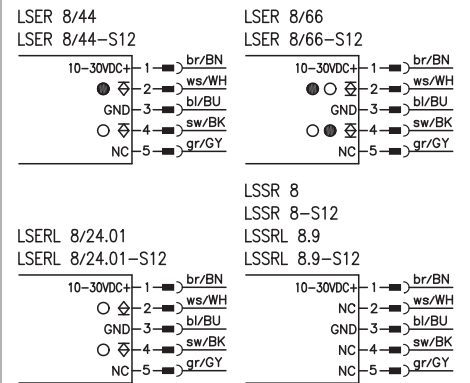
Inductive
Switches



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694
- Sensors w. laser transmitter Page 695

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options	
1	Adjustable focus
2	Sensitivity adjustment via potentiometer
3	UL approval

www.leuze.com/en/8series/

RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input checked="" type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Retro-reflective sensors with polarization filter										
PRK 8 / 44 - S12 50036360	<table border="1"><tr><td>0.1</td><td>6.4</td></tr><tr><td>0.05</td><td>8</td></tr></table>	0.1	6.4	0.05	8	<input type="checkbox"/>	1500Hz	Red light	2xPNP/DC	Light/dark antivalent
0.1	6.4									
0.05	8									
PRK 8 / 44 50036361	<table border="1"><tr><td>0.1</td><td>6.4</td></tr><tr><td>0.05</td><td>8</td></tr></table>	0.1	6.4	0.05	8	<input type="checkbox"/>	1500Hz	Red light	2xPNP/DC	Light/dark antivalent
0.1	6.4									
0.05	8									
PRK 8 / 66 - S12 50036362	<table border="1"><tr><td>0.1</td><td>6.4</td></tr><tr><td>0.05</td><td>8</td></tr></table>	0.1	6.4	0.05	8	<input type="checkbox"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
0.1	6.4									
0.05	8									
PRK 8 / 66 50036363	<table border="1"><tr><td>0.1</td><td>6.4</td></tr><tr><td>0.05</td><td>8</td></tr></table>	0.1	6.4	0.05	8	<input type="checkbox"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
0.1	6.4									
0.05	8									
PRK 8 / 66.11 - S12 50037133	<table border="1"><tr><td>0</td><td>5</td></tr><tr><td>0</td><td>7</td></tr></table>	0	5	0	7	<input type="checkbox"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
0	5									
0	7									
PRK 8 / 66.41 - S12 50037134	<table border="1"><tr><td>0</td><td>2</td></tr><tr><td>0</td><td>2.4</td></tr></table>	0	2	0	2.4	<input type="checkbox"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
0	2									
0	2.4									
PRK 8 / 66.42 - S12 50037135	<table border="1"><tr><td>0</td><td>2</td></tr><tr><td>0</td><td>2.4</td></tr></table>	0	2	0	2.4	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
0	2									
0	2.4									

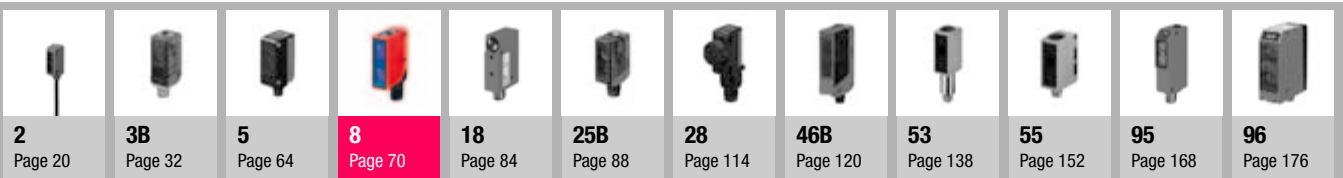
1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 677

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC



8 SERIES

Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	6	a, b, c, d	
Cable, 2 m	6		
M12 connector	6	a, b, c, d	
Cable, 2 m	6		
M12 connector	1, 3, 6	a, b, c, d	
M12 connector	1, 3, 4, 6	e, f	
M12 connector	2, 3, 4, 5, 6	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

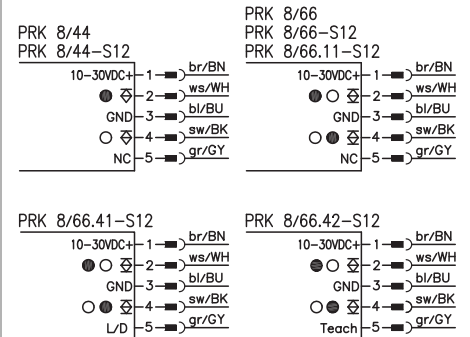
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Sensitivity adjustment via teach-in
- 3 Autocollimation principle
- 4 Transparent media (foil < 20µm and bottles)
- 5 Tracking function
- 6 UL approval

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

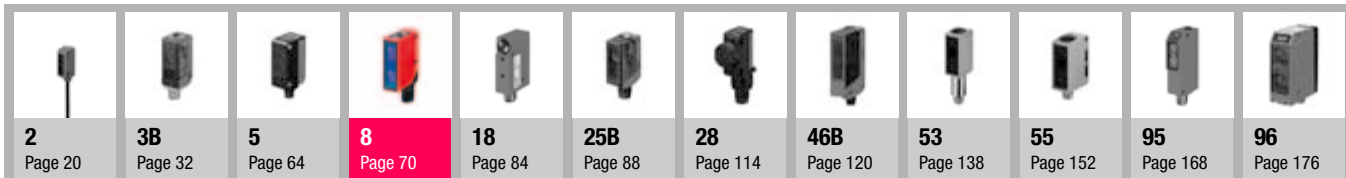
RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective laser sensors with polarization filter						
PRKL 8 / 24.91 - S12 50036364	0 19 0 22	<input type="checkbox"/>	2800Hz	Red light laser class 2	PNP/DC NPN/DC	Light Dark
PRKL 8 / 24.91 50036365	0 19 0 22	<input type="checkbox"/>	2800Hz	Red light laser class 2	PNP/DC NPN/DC	Light Dark
PRKL 8 / 24.99 - S12 50115689	0 12 0 14	<input type="checkbox"/>	2800Hz	Red light laser class 1	PNP/DC NPN/DC	Light Dark

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 677

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC	
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC	
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC	
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC	
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC	
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC	



8 SERIES

Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
			A Focus at 0.144m B Focus at 2m C Focus at 16m
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	
Cable, 2m	1, 2, 3, 4		
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

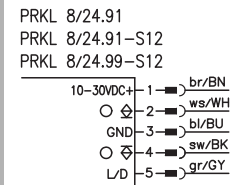
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains





Options

- 1 Sensitivity adjustment via potentiometer
- 2 Autocollimation principle
- 3 Adjustable focus
- 4 UL approval

Protective
Sensors

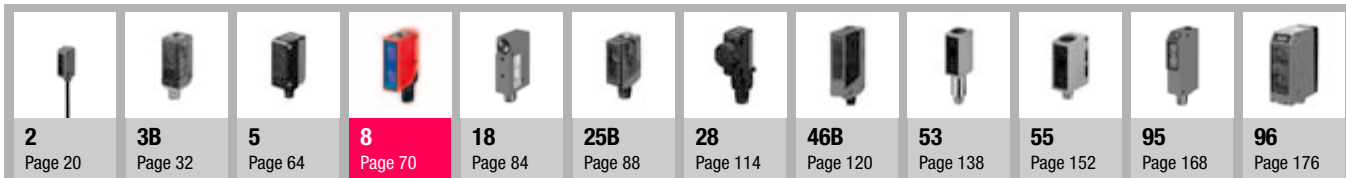
www.leuze.com/en/8series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners						
RTR 8 / 44 - 800 - S12 50036366		<input type="checkbox"/>	1500Hz	Red light	2xPNP/DC	Light/dark antivalent
RTR 8 / 44 - 800 50036367		<input type="checkbox"/>	1500Hz	Red light	2xPNP/DC	Light/dark antivalent
RTR 8 / 66 - 800 - S12 50036368		<input type="checkbox"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
RTR 8 / 66 - 800 50036369		<input type="checkbox"/>	1500Hz	Red light	2xPush-pull/DC	Light/dark antivalent

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



8 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2 m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2 m	1, 2		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

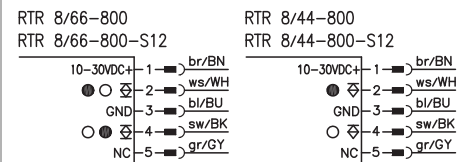
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Scanning range adjustment via potentiometer
- 2 UL approval

Protective
Sensors

www.leuze.com/en/8series/

DIFFUSE REFLECTION SCANNERS

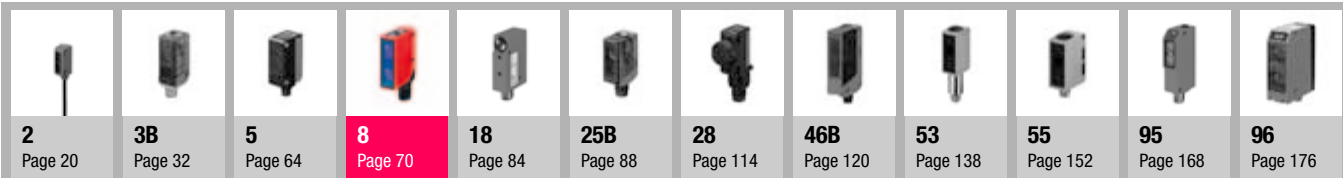
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Diffuse reflection scanners with background suppression										
HRTR 8 / 44 - 350 - S12 50036350	<table border="1"><tr><td>7</td><td>350</td></tr><tr><td>5</td><td>400</td></tr></table>	7	350	5	400	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
7	350									
5	400									
HRTR 8 / 44 - 350 50036351	<table border="1"><tr><td>7</td><td>350</td></tr><tr><td>5</td><td>400</td></tr></table>	7	350	5	400	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
7	350									
5	400									
HRTR 8 / 66 - 350 - S12 50036352	<table border="1"><tr><td>7</td><td>350</td></tr><tr><td>5</td><td>400</td></tr></table>	7	350	5	400	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
7	350									
5	400									
HRTR 8 / 66 - 350 50036353	<table border="1"><tr><td>7</td><td>350</td></tr><tr><td>5</td><td>400</td></tr></table>	7	350	5	400	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
7	350									
5	400									
HRTR 8 / 66 - 350, 5000 50108224	<table border="1"><tr><td>7</td><td>350</td></tr><tr><td>5</td><td>400</td></tr></table>	7	350	5	400	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
7	350									
5	400									
HRT 8 / 66.6 - 350 - S12 50039650	<table border="1"><tr><td>7</td><td>350</td></tr><tr><td>5</td><td>400</td></tr></table>	7	350	5	400	<input type="checkbox"/>	1000Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
7	350									
5	400									

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

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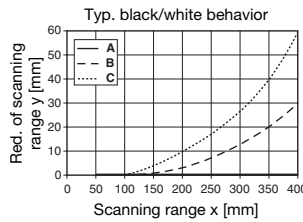
8 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2m	1, 2		
Cable, 5m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

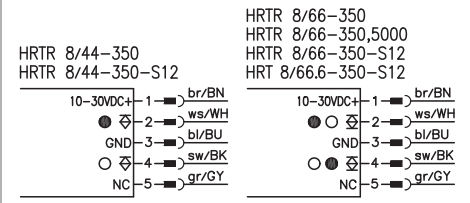
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 UL approval

www.leuze.com/en/8series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source Light spot ¹⁾	Output	Switching
Diffuse reflection laser scanners with background suppression						
HRTL 8 / 24 - 350 - S12 50036370		<input type="checkbox"/>	2000Hz	Red light laser class 2 Ø 1.0 mm	PNP/DC NPN/DC	Light
HRTL 8 / 24 - 350 50036371		<input type="checkbox"/>	2000Hz	Red light laser class 2 Ø 1.0 mm	PNP/DC NPN/DC	Light
HRTL 8 / 66 - 350 - S12 50102705		<input type="checkbox"/>	2000Hz	Red light laser class 2 Ø 1.0 mm	2xPush-pull/DC	Light/dark antivalent
HRTL 8 / 66 - 350, 5000 50103709		<input type="checkbox"/>	2000Hz	Red light laser class 2 Ø 1.0 mm	2xPush-pull/DC	Light/dark antivalent
HRTL 8 / 24 - 150 - S12 50038482		<input type="checkbox"/>	2000Hz	Red light laser class 2 Ø 0.75 mm	PNP/DC NPN/DC	Light
HRTL 8 / 24 - 150 50038483		<input type="checkbox"/>	2000Hz	Red light laser class 2 Ø 0.75 mm	PNP/DC NPN/DC	Light
HRTL 8 / 66 - 150 - S12 50102704		<input type="checkbox"/>	2000Hz	Red light laser class 2 Ø 0.75 mm	2xPush-pull/DC	Light/dark antivalent
HRTL 8 / 66.09 - 150 - S12 50115688		<input type="checkbox"/>	2000Hz	Red light laser class 1 Ø 0.75 mm	2xPush-pull/DC	Light/dark antivalent

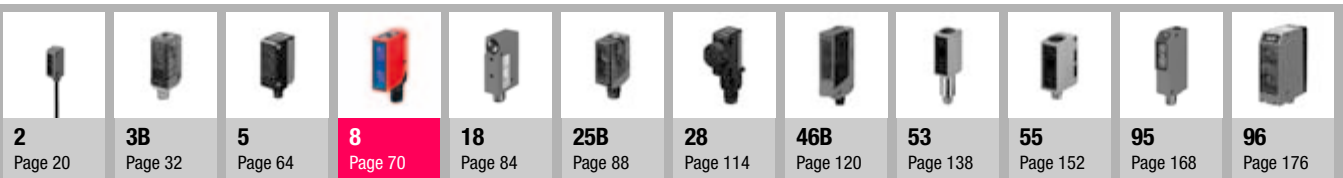
1) At the specified scanning range

We reserve the right to make changes • BR8_HRTL_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



8 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 5m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
M12 connector	1, 2	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection

HRTL 8/24-150	HRTL 8/66-150-S12
HRTL 8/24-150-S12	HRTL 8/66.09-150-S12
HRTL 8/24-350	HRTL 8/66-350, 5000
HRTL 8/24-350-S12	HRTL 8/66-350-S12

10-30VDC+ 1	br/BN	10-30VDC+ 1	br/BN
2	ws/WH	2	ws/WH
3	bl/BU	3	bl/BU
4	sw/BK	4	sw/BK
5	gr/GY	5	gr/GY

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 UL approval

www.leuze.com/en/8series/

OVERVIEW



Bottle cleaning

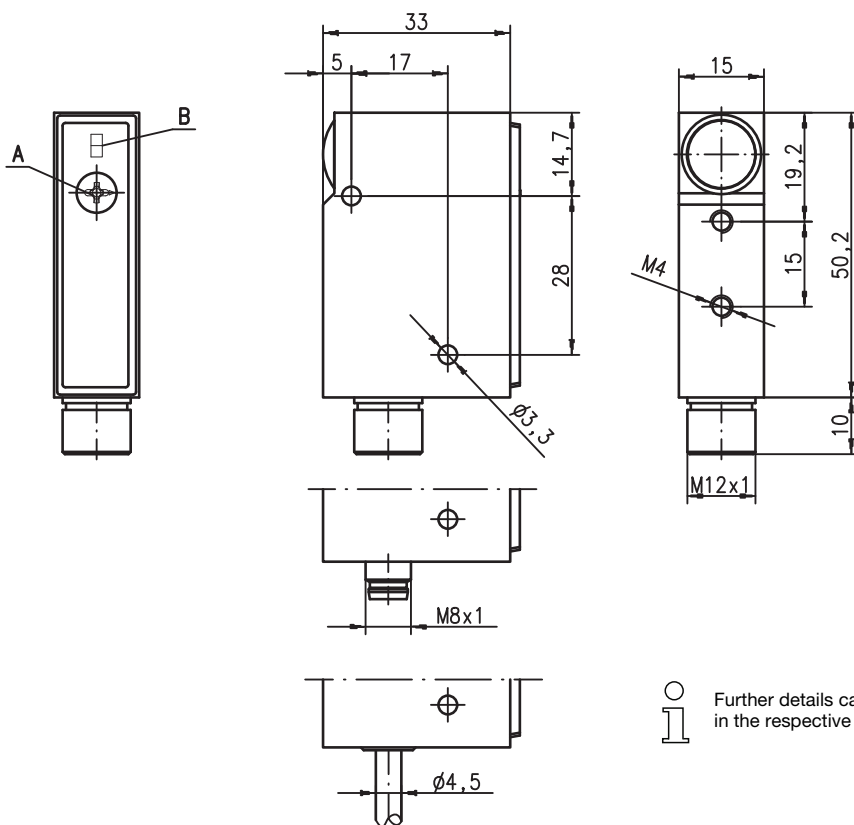


Suspended bottle transport



Bottle inspection

Dimensioned drawing




- A** Sensitivity adjustment
- B** Indicator diode

We reserve the right to make changes • BR18_Overview_EN.fm

2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

18 SERIES

Operating principle	Typ. operating range limits	Page
 Retro-reflective sensors	0 ... 5 m	86

Other 18 Series products:

 Ultrasonic sensors	LSU 18	336
 AS-interface sensors	IPRK 18	622



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Yellow LED	Switching output
Mechanical data	Housing	Diecast zinc
	Optics cover	Glass
	Weight (connector/cable)	90g/150g
Environmental data	Ambient temperature (operation)	$-25^\circ\text{C} \dots +55^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 67, IP 69K
	Standards applied	IEC 60947-5-2, UL 508

Features

- Stainless steel and metal housing
- Glass optics
- IP 67 and IP 69K
- Detection of PET, foil, and glass



Optical Sensor

- | | |
|--|----------|
| ● Retro-reflective sensors | Page 689 |
| ● Retro-reflective sensor with polarization filter | Page 689 |
| ● A ² LS | Page 697 |

Mounting systems for this series can be found from page 629 onwards

RETRO-REFLECTIVE SENSORS

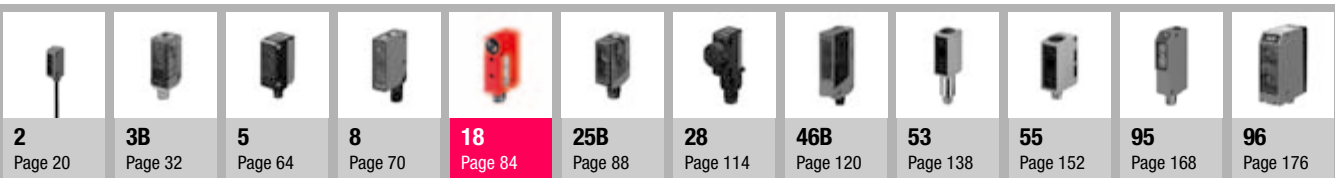
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 18 / 44 L.43 50115193	0 3 ¹⁾ 0 4 ¹⁾	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
IPRK 18 / 4 DL.41 50033552	0 3 ¹⁾ 0 4 ¹⁾	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light/dark reversible
PRK 18 / 24 DL.42 50033554	0 3 ¹⁾ 0 4 ¹⁾	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Red light	PNP/DC NPN/DC	Dark
PRK 18 / 24 DL.46 50032798	0 3 ¹⁾ 0 4 ¹⁾	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Red light	PNP/DC NPN/DC	Light/dark reversible
PRK 18 / 4 L.4 50104415	0 2.4 ¹⁾ 0 3 ¹⁾	<input type="checkbox"/> <input type="checkbox"/>	1500Hz	Red light	PNP/DC	Light/dark reversible
IPRK 18 / V L.03 50106974	0 1 ²⁾ 0 1.2 ²⁾	<input type="checkbox"/> <input type="checkbox"/>	–	Red light	Analog/mA, 1xPNP/DC	–

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 678
 2) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 678

We reserve the right to make changes • BR18_PRK2_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC



18 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2, 3, 4, 5	e, f	
M12 connector	1, 2, 3, 5, 6, 9	e, f	
M12 connector	1, 2, 3, 4, 5, 9	e, f	
M12 connector	1, 2, 3, 5, 9	e, f	
M12 connector	1, 2, 7, 8, 9	a, b, c, d	
M12 connector	2, 4, 6, 9	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

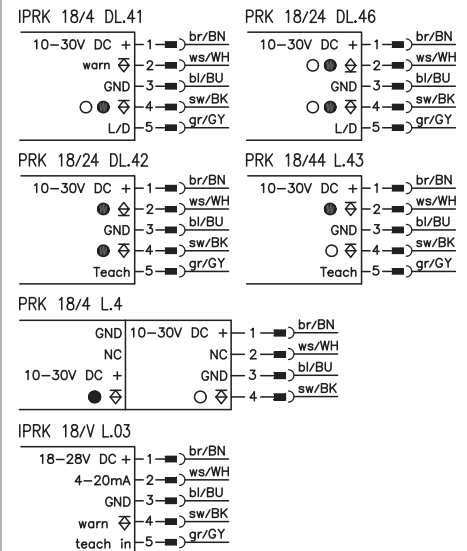
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Transparent media (foil < 20µm and bottles)
- 2 LEDs for the operating mode/setting the operating point
- 3 Teach-in via step switch
- 4 Teach-in via control cable
- 5 Dirt/cleaning compensation (step/peak tracking)
- 6 Warning output
- 7 Sensitivity adjustment via multiturn potentiometer
- 8 Autocollimation principle
- 9 UL approval

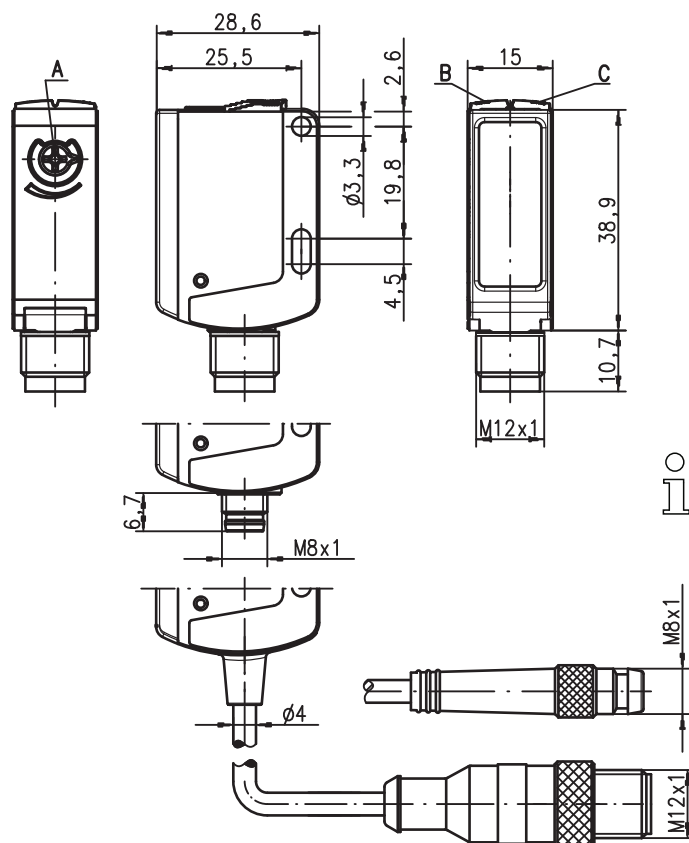
Protective
Sensors

OVERVIEW



Object detection in distribution systems

Dimensioned drawing






Further details can be found in the respective data sheet.

- A** Operational control
- B** Green indicator diode
- C** Yellow indicator diode

We reserve the right to make changes • BR25_Overview_EN.fm

2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

25B SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 — 24 m	90
 Retro-reflective sensors	0 — 15 m	92
 Diffuse reflection scanners	0 ... 1000 mm	100

Other 25B Series products:

 Protective sensors	SLSR 25B	600
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Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Plastic
	Optics cover	Plastic
	Weight (connector/cable)	15g/55g
Environmental data	Ambient temperature (operation)	$-30^\circ\text{C} \dots +60^\circ\text{C}$
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 66
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 629 onwards

Features

- IP 67 and IP 66
 - Active ambient light suppression A²LS
- New retro-reflective sensor PRK 25B:**
- Highest performance reserve
 - Reliable function with shrink-wrapped objects or containers
 - Very bright light spot, indicator diodes visible from all sides



Optical Sensor

- | | |
|-------------------------------|----------|
| ● Throughbeam sensors | Page 689 |
| ● Retro-reflective sensors | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A ² LS | Page 697 |

THROUGHBEAM SENSORS

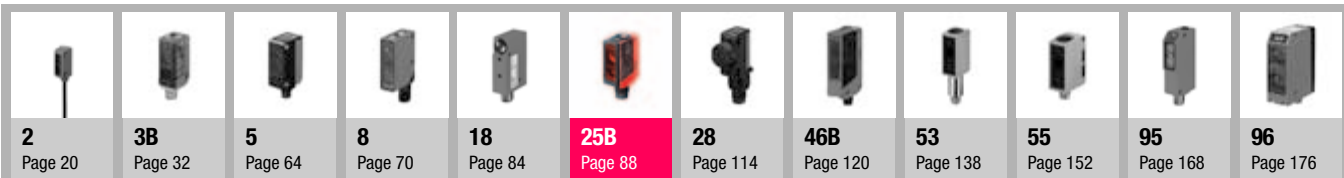
Part description		Operating range [m]	Switching frequency	Light source	Output	Switching	
Part No.:		Typ. op. range limit [m]					
Throughbeam sensors		▶ = Transmitter ◀ = Receiver					
▶ LSSR 25B.8 - S12	50108478		500Hz	Red light	1xPNP/DC	Light	
◀ ILSER 25B / 4 - S12	50108487						
▶ LSSR 25B - S12	50108477		500Hz	Red light	1xPNP/DC	Light	
◀ ILSER 25B / 4 - S12	50108487						
▶ LSSR 25B, 200 - S8.1	50110872		500Hz	Red light	1xPNP/DC	Light	
◀ LSER 25B / 4, 200 - S8.1	50110873						
▶ LSSR 25B, 200 - S12	50110922		500Hz	Red light	1xPNP/DC	Light	
◀ LSER 25B/4, 200 - S12	50110923						
▶ LSSR 25B.8	50108480		500Hz	Red light	2xPush-pull/DC	Light/dark antivalent	
◀ LSER 25B / 66	50108486						
▶ LSSR 25B.8 - S12	50108478		500Hz	Red light	2xPush-pull/DC	Light/dark antivalent	
◀ LSER 25B / 66 - S12	50108483						
▶ LSSR 25B - S12	50108477		500Hz	Red light	2xPush-pull/DC	Light/dark antivalent	
◀ LSER 25B / 66 - S12	50108483						
▶ LSSR 25B.8 - S8	50108479		500Hz	Red light	2xPush-pull/DC	Light/dark antivalent	
◀ LSER 25B / 66 - S8	50108485						
▶ LSSR 25B - S12	50108477		500Hz	Red light	2xPush-pull/DC	Light/dark antivalent	
◀ LSER 25B / 66.1 - S12	50108484						

We reserve the right to make changes • BR25_LSR_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



25B SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	2, 3, 5	c, d, e, f	
M12 connector	3, 5	c, d, e, f	
Cable, 0.2m, with M8 connector ¹⁾	4, 5	a, b	
Cable, 0.2m, with M12 connector	4, 5	c, d, e, f	
Cable, 2m	2, 5		
M12 connector	2, 5	c, d, e, f	
M12 connector	5	c, d, e, f	
M8 connector	2, 5	a, b	
M12 connector	1, 5	c, d, e, f	

1) Acc. to IEC 61076-2-101, NM construction with snap locking

Options

- Sensitivity adjustment via potentiometer
- Transmitter with activation input
- Receiver with warning output
- Direct connection to AS-interface I/O coupling modules
- UL approval (class 2 acc. to NEC)



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

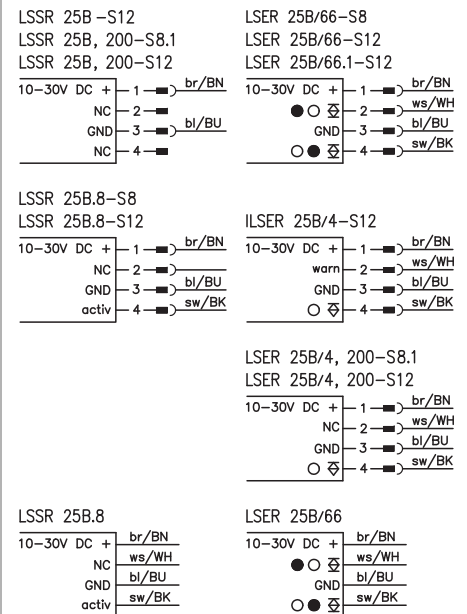
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors


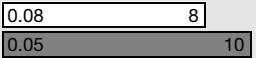


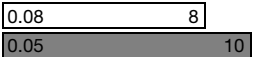





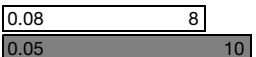
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

RETRO-REFLECTIVE SENSORS

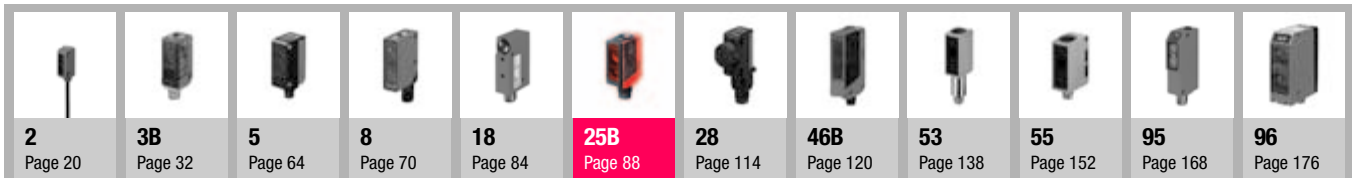
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 25B / 4.8 - S12 50104227		<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
IPRK 25B / 4 - S12 50104228		<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
PRK 25B / 4, 200 - S8.1 50113771		<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
IPRK 25B / 4, 200 - S12 50104229		<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
PRK 25B / 44 - S12 50109432		<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 25B / 66 - S8 50104224		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66 - S12 50104223		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.1 - S12 50104230		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66 50104225		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66, 100 - S8 50105739		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66, 200 - S12 50104226		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR25_PRKB1_EN.fm



25B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

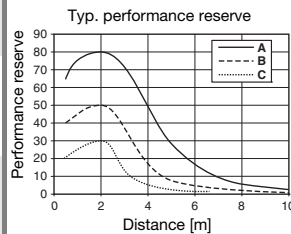
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Option	Accessories	Typ. performance reserve
M12 connector	2, 5	c, d	
M12 connector	3, 5	c, d	
Cable, 0.2m, with M8 connector ²⁾	4, 5	a, b	
Cable, 0.2m, with M12 connector	3, 5	c, d	
M12 connector	5	c, d	
M8 connector	5	a, b	
M12 connector	5	c, d	
M12 connector	1, 5	c, d	
Cable, 2m	5		
Cable, 0.1 m, with M8 connector	5	a, b	
Cable, 0.2m, with M12 connector	5	c, d	



- A TK(S) 100x100
- B TK(S) 40x60
- C TK(S) 20x40

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679

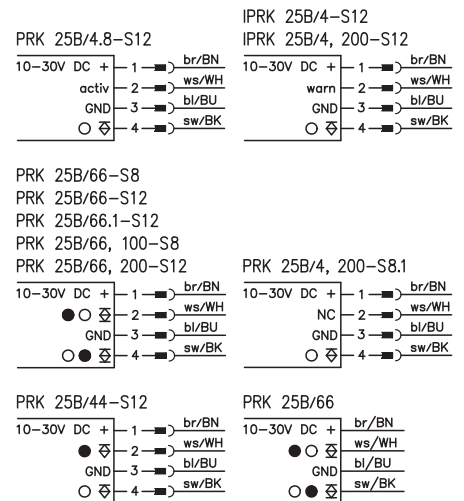
2) Acc. to IEC 61076-2-101, NM construction with snap locking



Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Activation input
- 3 Warning output
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval (class 2 acc. to NEC)

RETRO-REFLECTIVE SENSORS

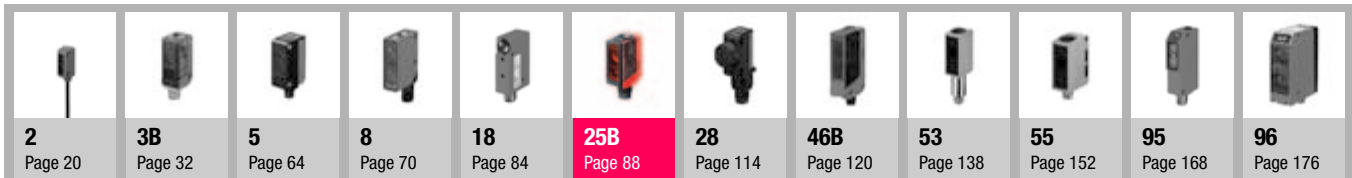
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input checked="" type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 25B / 44.3 - S12 50117202	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 25B / 44.3, 200 - S12 50120578	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 25B / 4.38 - S12 50104247	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
IPRK 25B / 4.3 - S12 50104246	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
PRK 25B / 4.3, 200 - S8.1 50110874	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
PRK 25B / 4.3, 200 - S12 50110924	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
IPRK 25B / 4.3, 200 - S12 50108111	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
PRK 25B / 4D.3 - S8 50104241	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark
PRK 25B / 4D.3 - S12 50104242	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark
PRK 25B / 4D.3, 200 - S12 50108549	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark
PRK 25B / 4D.3, 2000 - S12 50118424	0.12 6 0.07 8	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR25_PRKB2_EN.fm



25B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M12 connector	1, 5	c, d	
Cable, 0.2m, with M12 connector	1, 5	c, d	
M12 connector	1, 2, 5	c, d	
M12 connector	1, 3, 5	c, d	
Cable, 0.2m, with M8 connector ²⁾	1, 4, 5	a, b	<p>Typ. performance reserve</p> <p>A TK(S) 100x100 B TK(S) 40x60 C TK(S) 20x40</p> <p>1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679 2) Acc. to IEC 61076-2-101, NM construction with snap locking</p>
Cable, 0.2m, with M12 connector	1, 4, 5	c, d	
Cable, 0.2m, with M12 connector	1, 3, 5	c, d	
M8 connector	1, 4, 5	a, b	
M12 connector	1, 4, 5	c, d	
Cable, 0.2m, with M12 connector	1, 4, 5	c, d	
Cable, 2m, with M12 connector	1, 4, 5	c, d	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

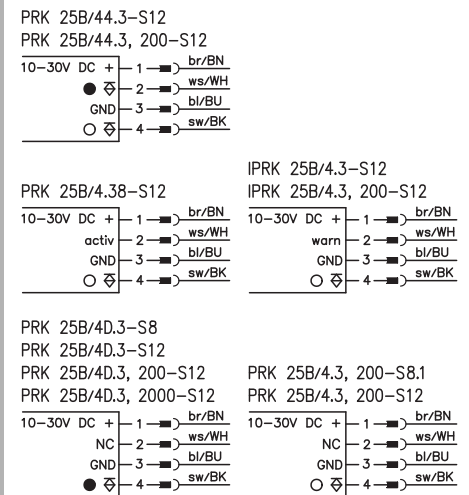
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Depolarizing media (e.g. foil packaging)
- 2 Activation input
- 3 Warning output
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval (class 2 acc. to NEC)

www.leuze.com/en/25series/

RETRO-REFLECTIVE SENSORS

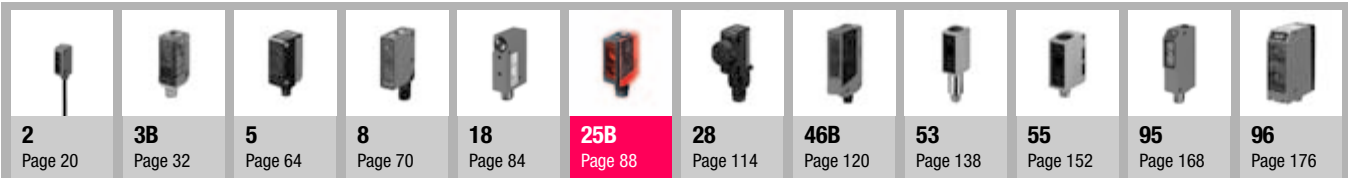
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input checked="" type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 25B / 66.3 - S8 50104237	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.31 - S8 50104244	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.3 - S12 50104236	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.31 - S12 50104243	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.3 50104238	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.31 50104245	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.3, 200 - S8 50104239	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.3, 200 - S12 50104240	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.31, 200 - S12 50115992	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 25B / 66.30, 200 - S12 50106203	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
IPRK 25B / 6.3, 200 - S12 50107687	0.12 6 0.07 8	<input type="checkbox"/> <input checked="" type="checkbox"/>	500Hz	Red light	1xPush-pull/DC	Light

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR25_PRKB3_EN.fm



25B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	2, 5	a, b	
M8 connector	1, 2, 5	a, b	
M12 connector	2, 5	c, d	
M12 connector	1, 2, 5	c, d	
Cable, 2 m	2, 5		<p>Typ. performance reserve</p> <p>Performance reserve</p> <p>Distance [m]</p> <p>A TK(S) 100x100 B TK(S) 40x60 C TK(S) 20x40</p> <p>1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679</p>
Cable, 2 m	1, 2, 5		
Cable, 0.2 m, with M8 connector	2, 5	a, b	
Cable, 0.2 m, with M12 connector	2, 5	c, d	
Cable, 0.2 m, with M12 connector	1, 2, 5	c, d	
Cable, 0.2 m, with M12 connector	2, 3, 5	c, d	
Cable, 0.2 m, with M12 connector	2, 4, 5	c, d	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

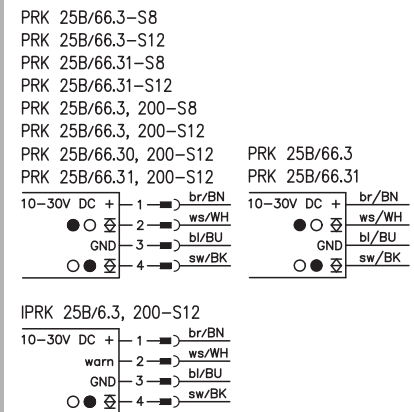
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Depolarizing media (e.g. foil packaging)
- 3 Connection plug, yellow, extruded
- 4 Warning output
- 5 UL approval (class 2 acc. to NEC)

Light
Curtains

Protective
Sensors

www.leuze.com/en/25series/

RETRO-REFLECTIVE SENSORS

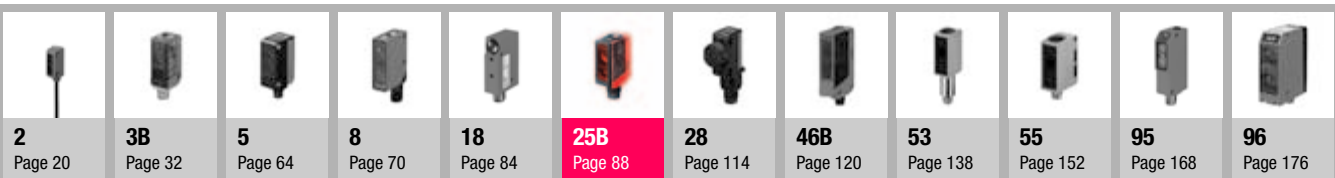
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective laser sensors with polarization filter						
PRKL 25B / 4D.1 - S12 50104232	0.30 12 0.05 15	<input type="checkbox"/>	2000Hz	Red light laser class 2	PNP/DC	Dark
PRKL 25B / 4.1, 200 - S12 50110921	0.30 12 0.05 15	<input type="checkbox"/>	2000Hz	Red light laser class 2	PNP/DC	Light
PRKL 25B / 6.81 - S12 50104233	0.30 12 0.05 15	<input type="checkbox"/>	2000Hz	Red light laser class 2	Push-pull/DC	PNP/light NPN/dark
PRKL 25B / 66.1 - S8 50104234	0.30 12 0.05 15	<input type="checkbox"/>	2000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
PRKL 25B / 66.1 - S12 50104231	0.30 12 0.05 15	<input type="checkbox"/>	2000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
PRKL 25B / 66.1 50104235	0.30 12 0.05 15	<input type="checkbox"/>	2000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679

We reserve the right to make changes • BR25_PRKLB_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

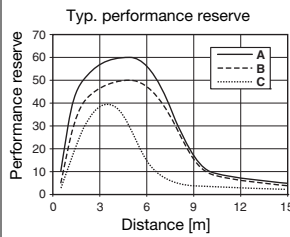


25B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M12 connector	1, 3, 4	c, d, e, f	
Cable, 0.2m, with M12 connector	1, 3, 4	c, d, e, f	
M12 connector	1, 2, 4	c, d, e, f	
M8 connector	1, 4	a, b	
M12 connector	1, 4	c, d, e, f	
Cable, 2m	1, 4		



- A TK(S) 100x100
- B MTKS 50x50
- C MTKS 20x20



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

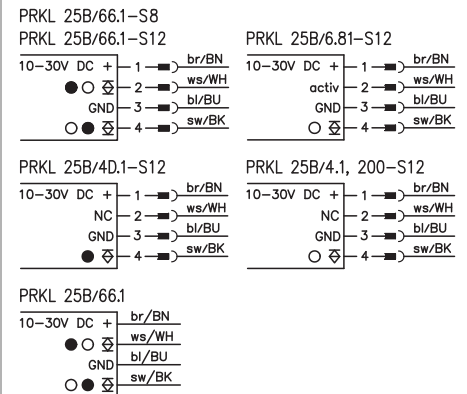
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

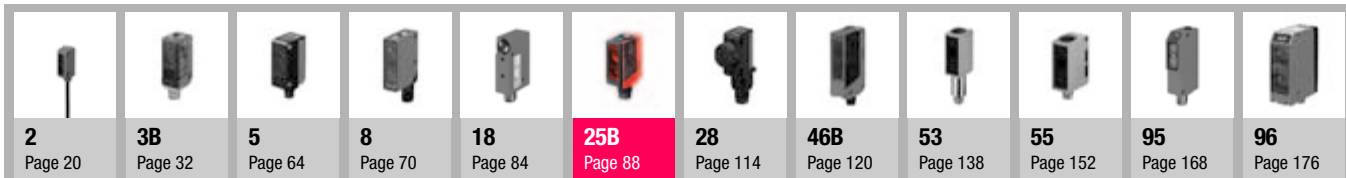
- 1 Sensitivity adjustment via potentiometer
- 2 Activation input
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Energetic diffuse reflection scanners										
RTR 25B / 66 - S12 50108476	<table border="1"> <tr><td>20</td><td>500</td></tr> <tr><td>10</td><td>500</td></tr> </table>	20	500	10	500	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
20	500									
10	500									
Diffuse reflection light scanners with fading										
RTFR 25B / 66 - S8 50108474	<table border="1"> <tr><td>20</td><td>500</td></tr> <tr><td>10</td><td>550</td></tr> </table>	20	500	10	550	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
20	500									
10	550									
RTFR 25B / 66 - S12 50108472	<table border="1"> <tr><td>20</td><td>500</td></tr> <tr><td>10</td><td>550</td></tr> </table>	20	500	10	550	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
20	500									
10	550									
RTFR 25B / 66 50108475	<table border="1"> <tr><td>20</td><td>500</td></tr> <tr><td>10</td><td>550</td></tr> </table>	20	500	10	550	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
20	500									
10	550									
RTFR 25B / 66, 200 - S12 50108473	<table border="1"> <tr><td>20</td><td>500</td></tr> <tr><td>10</td><td>550</td></tr> </table>	20	500	10	550	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
20	500									
10	550									

We reserve the right to make changes • BR25_RTFRB_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	



25B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
M12 connector	1, 2	c, d, e, f	
M8 connector	1, 2	a, b	< 50%
M12 connector	1, 2	c, d, e, f	< 50%
Cable, 2m	1, 2		< 50%
Cable, 0.2m, with M12 connector	1, 2	c, d, e, f	< 50%



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

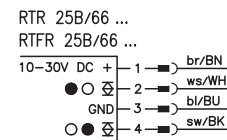
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with fading Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Scanning range adjustment via potentiometer
- 2 UL approval (class 2 acc. to NEC)

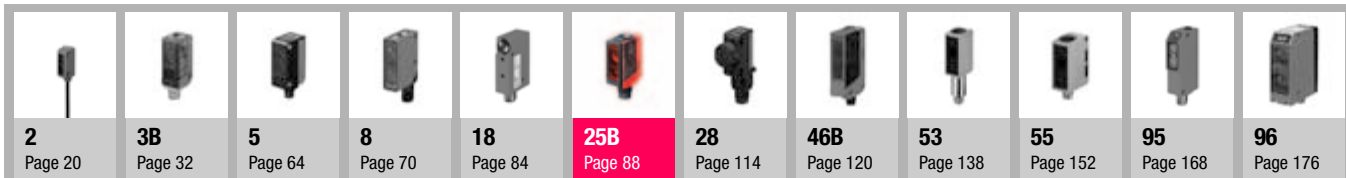
Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 25B / 4D - S12 50115138	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	1xPNP/DC	Dark
HRTR 25B / 4D, 200 - S8 50115136	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	1xPNP/DC	Dark
HRTR 25B / 4D, 200 - S8.1 50115135	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	1xPNP/DC	Dark
HRTR 25B / 4D, 200 - S12 50115137	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	1xPNP/DC	Dark
HRTR 25B / 44 - S8 50115146	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 25B / 44 - S12 50115147	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2xPNP/DC	Light/dark antivalent

We reserve the right to make changes • BR25_HRTRB1_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	



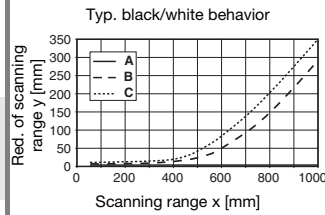
25B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 3	c, d, e, f	
Cable, 0.2m, with M8 connector	1, 2, 3	a, b	
Cable, 0.2m, with M8 connector ¹⁾	1, 2, 3	a, b	
Cable, 0.2m, with M12 connector	1, 2, 3	c, d, e, f	
M8 connector	1, 3	a, b	
M12 connector	1, 3	c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

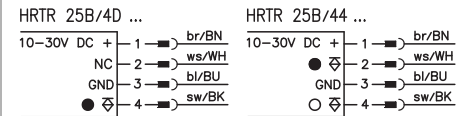
Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

1) Acc. to IEC 61076-2-101, NM construction with snap locking

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 UL approval

DIFFUSE REFLECTION SCANNERS

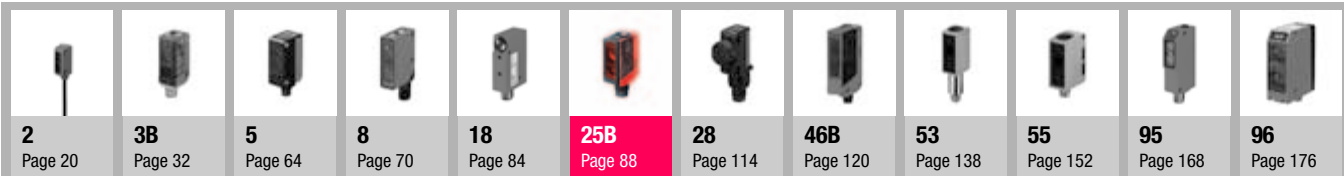
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input checked="" type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 25B / 6 - S12 50115144	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	1 x Push-pull/DC	Light
HRTR 25B / 6.8 - S12 50115141	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	1 x Push-pull/DC	Light
HRTR 25B / 6 50115140	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	1 x Push-pull/DC	Light
HRTR 25B / 66 - S8 50115153	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2 x Push-pull/DC	Light/dark antivalent
HRTR 25B / 66 - S12 50114491	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2 x Push-pull/DC	Light/dark antivalent
HRTR 25B / 66 50115150	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2 x Push-pull/DC	Light/dark antivalent
HRTR 25B / 66, 5000 50116721	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2 x Push-pull/DC	Light/dark antivalent
HRTR 25B / 66, 200 - S8 50115151	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2 x Push-pull/DC	Light/dark antivalent
HRTR 25B / 66, 200 - S12 50115152	0 350 0 1000	<input type="checkbox"/>	250Hz	Red light	2 x Push-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR25_HRTRB2_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



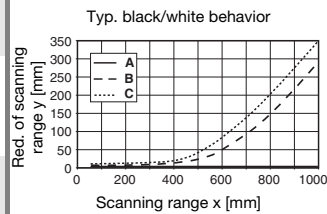
25B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 3, 4	c, d, e, f	
M12 connector	1, 2, 4	c, d, e, f	
Cable, 2m	1, 4		
M8 connector	1, 4	a, b	
M12 connector	1, 4	c, d, e, f	
Cable, 2m	1, 4		
Cable, 5m	1, 4		
Cable, 0.2m, with M8 connector	1, 4	a, b	
Cable, 0.2m, with M12 connector	1, 4	c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

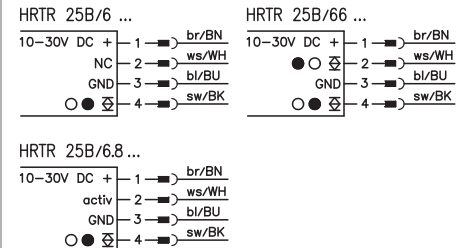
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

- ### Options
- 1 Scanning range adjustment via multiturn potentiometer
 - 2 Activation input
 - 3 Direct connection to AS-interface I/O coupling modules
 - 4 UL approval

www.leuze.com/en/25series/

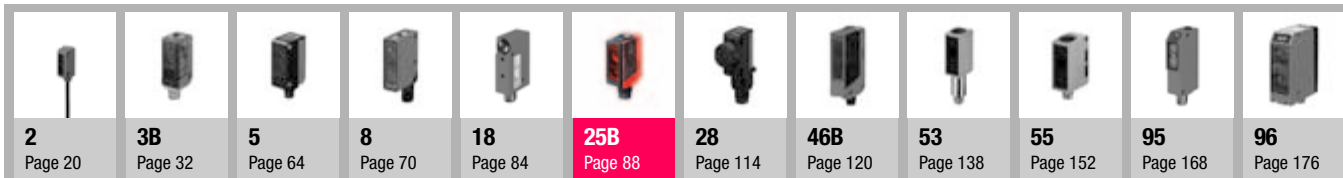
Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 25B / 44 - S - S12 50115149	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 25B / 44 - S 50115148	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 25B / 6 - S - S12 50115145	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
HRTR 25B / 6.8 - S - S12 50115142	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	1xPush-pull/DC	Light
HRTR 25B / 66 - S - S8 50115156	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 25B / 66 - S - S12 50114875	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 25B / 66 - S 50115154	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 25B / 66 - S, 200 - S12 50115155	<input type="text" value="0"/> <input type="text" value="300"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR25_HRTRB3_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



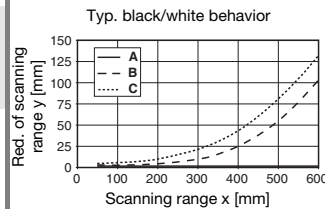
25B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 5	c, d, e, f	
Cable, 2m	1, 2, 5		
M12 connector	1, 2, 4, 5	c, d, e, f	
M12 connector	1, 2, 3, 5	c, d, e, f	
M8 connector	1, 2, 5	a, b	
M12 connector	1, 2, 5	c, d, e, f	
Cable, 2m	1, 2, 5		
Cable, 0.2m, with M12 connector	1, 2, 5	c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

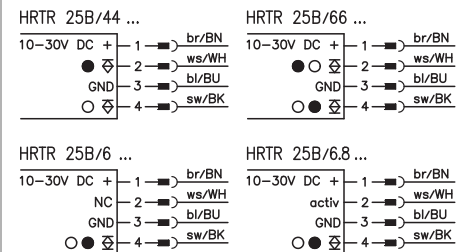
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Focused light spot for the reliable detection of objects with glossy and inconsistently structured surfaces
- 3 Activation input
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval

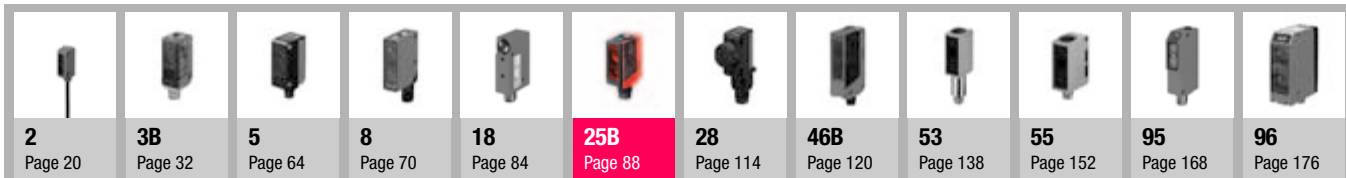
www.leuze.com/en/25series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/> Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression					
HRTR 25B / 4D - XL - S12 50115139	<input type="text" value="0"/> <input type="text" value="350"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/> <input type="checkbox"/> 250Hz	Red light	1xPNP/DC	Dark
HRTR 25B / 4D - XL, 200 - S12 50116808	<input type="text" value="0"/> <input type="text" value="350"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/> <input type="checkbox"/> 250Hz	Red light	1xPNP/DC	Dark
HRTR 25B / 6.8 - XL - S12 50115143	<input type="text" value="0"/> <input type="text" value="350"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/> <input type="checkbox"/> 250Hz	Red light	1xPush-pull/DC	Light
HRTR 25B / 66 - XL - S12 50114876	<input type="text" value="0"/> <input type="text" value="350"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/> <input type="checkbox"/> 250Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 25B / 66 - XL 50116532	<input type="text" value="0"/> <input type="text" value="350"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/> <input type="checkbox"/> 250Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 25B / 66 - XL, 200 - S8 50115157	<input type="text" value="0"/> <input type="text" value="350"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/> <input type="checkbox"/> 250Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 25B / 66 - XL, 200 - S12 50115158	<input type="text" value="0"/> <input type="text" value="350"/> <input type="text" value="0"/> <input type="text" value="600"/>	<input type="checkbox"/> <input type="checkbox"/> 250Hz	Red light	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR25_HRTRB4_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



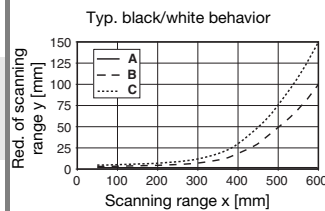
25B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 4, 5	c, d, e, f	
Cable, 0.2m, with M12 connector	1, 2, 4, 5	c, d, e, f	
M12 connector	1, 2, 3, 5	c, d, e, f	
M12 connector	1, 2, 5	c, d, e, f	
Cable, 2m	1, 2, 5		
Cable, 0.2m, with M8 connector	1, 2, 5	a, b	
Cable, 0.2m, with M12 connector	1, 2, 5	c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

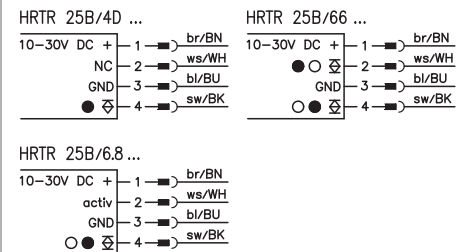
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Large light spot for exact, reliable edge detection – positioning on glossy, broken (perforated) metallic surfaces e.g. slide bolts
- 3 Activation input
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval

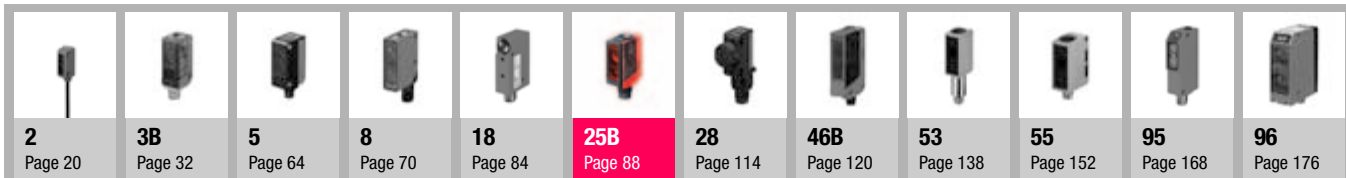
Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRT 25B / 4D - S8 50115121	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPNP/DC	Dark
HRT 25B / 4D - S12 50115122	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPNP/DC	Dark
HRT 25B / 4D, 200 - S12 50120272	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPNP/DC	Dark
HRT 25B / 44 - S8 50115129	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 25B / 44 - S12 50115130	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	2xPNP/DC	Light/dark antivalent

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	



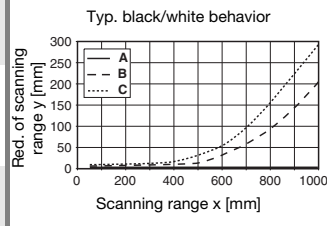
25B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 3	a, b	
M12 connector	1, 2, 3	c, d, e, f	
Cable, 0.2m, with M12 connector	1, 2, 3	c, d, e, f	
M8 connector	1, 3	a, b	
M12 connector	1, 3	c, d, e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

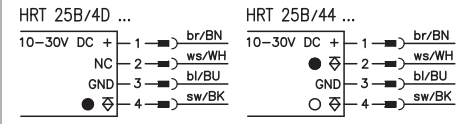
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Options
1 Scanning range adjustment via multiturn potentiometer
2 Direct connection to AS-interface I/O coupling modules
3 UL approval

Light
Curtains

Protective
Sensors

www.leuze.com/en/25series/

DIFFUSE REFLECTION SCANNERS

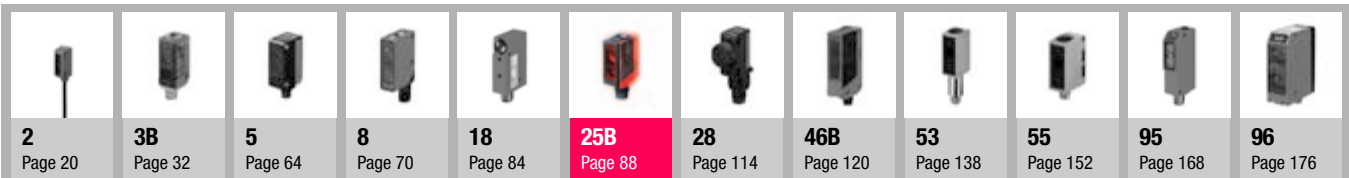
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRT 25B / 6 - S8 50115127	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPush-pull/DC	Light
HRT 25B / 6 - S12 50115128	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPush-pull/DC	Light
HRT 25B / 6, 200 - S12 50115126	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPush-pull/DC	Light
HRT 25B / 6.8 - S12 50115124	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPush-pull/DC	Light
HRT 25B / 6.8, 200 - S12 50115123	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	1xPush-pull/DC	Light
HRT 25B / 66 - S8 50115134	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
HRT 25B / 66 - S12 50114874	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
HRT 25B / 66 50115131	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
HRT 25B / 66, 200 - S8 50115132	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
HRT 25B / 66, 200 - S12 50115133	<input type="text" value="0"/> <input type="text" value="500"/> <input type="text" value="0"/> <input type="text" value="1000"/>	<input type="checkbox"/>	250Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
d 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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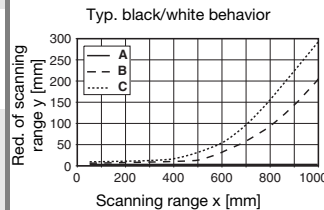
25B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 3, 4	a, b	
M12 connector	1, 3, 4	c, d, e, f	
Cable, 0.2m, with M12 connector	1, 3, 4	c, d, e, f	
M12 connector	1, 2, 4	c, d, e, f	
Cable, 0.2m, with M12 connector	1, 2, 4	c, d, e, f	
M8 connector	1, 4	a, b	
M12 connector	1, 4	c, d, e, f	
Cable, 2m	1, 4		
Cable, 0.2m, with M8 connector	1, 4	a, b	
Cable, 0.2m, with M12 connector	1, 4	c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

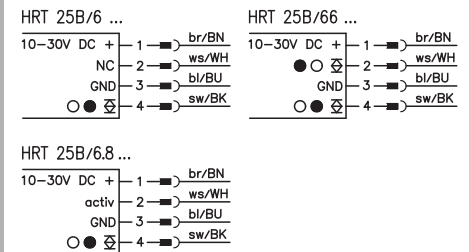
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

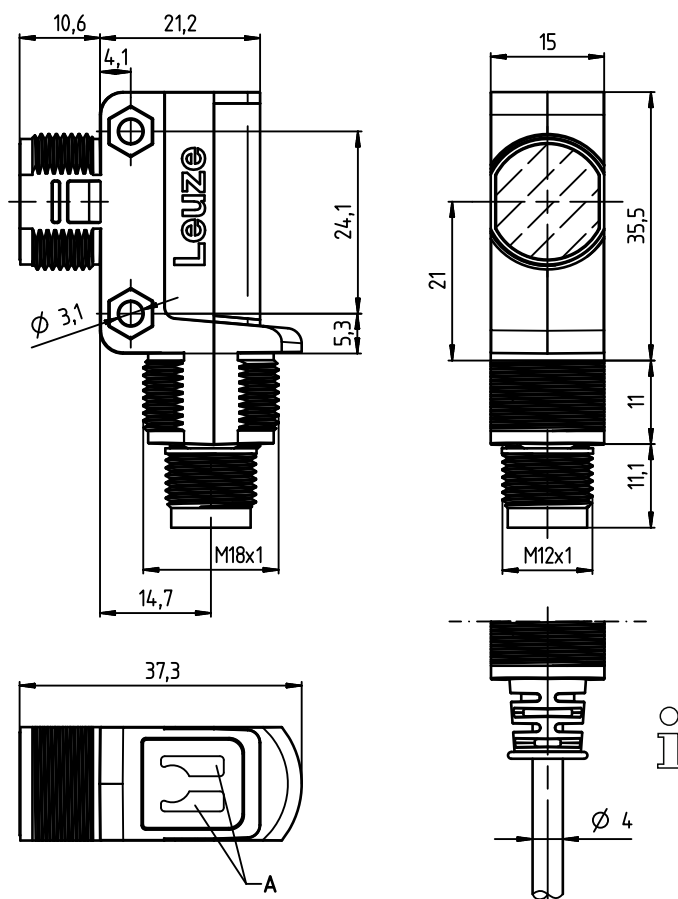
Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Activation input
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval

OVERVIEW

Dimensioned drawing



Further details can be found in the respective data sheet.



A Yellow/green indicator diodes

We reserve the right to make changes • BR28_Overview_EN.fm

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28 SERIES

Photoel. sensors/
light scanners,
cubic housing

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 ... 15 m	116
 Retro-reflective sensors	0.02 ... 6 m	118



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Common technical data		
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 20\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2.5\text{V}) / \leq 2.5\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Plastic (with GRP)
	Optics cover	Plastic
	Weight (connector/cable)	25g/75g
Environmental data	Ambient temperature (operation)	$-40^\circ\text{C} \dots +60^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2
	Certifications	in preparation for the North American market
Mounting systems for this series can be found from page 629 onwards		

Features

- Sensors with visible red light
- Universal front- and plug-side M18-hole mounting option
- Simple through hole mounting with anti-rotation protection for nuts on the housing
- Sturdy, glass fiber reinforced plastic housing for industrial application



Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

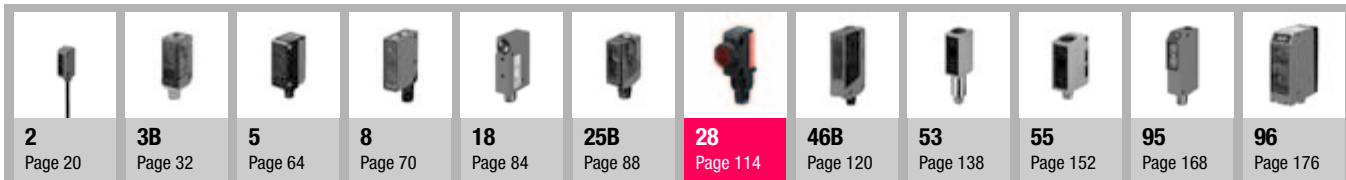
Protective
Sensors

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m]	<input type="checkbox"/> Typ. op. range limit [m]	Switching frequency	Light source	Output	Switching
Throughbeam sensors ▶ = Transmitter ◀ = Receiver						
▶ LS 28/9D - M12 ◀ LE 28/4P - M12	50117928 50117930	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="15"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 28/9D ◀ LE 28/4P	50117929 50117931	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="15"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 28/9D - M12 ◀ LE 28/2N - M12	50117928 50117932	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="15"/>	500Hz	Red light	2 x NPN/DC	Light/dark antivalent
▶ LS 28/9D ◀ LE 28/2N	50117929 50117933	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="15"/>	500Hz	Red light	2 x NPN/DC	Light/dark antivalent

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



28 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2 m	1, 2, 3		
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2 m	1, 2, 3		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

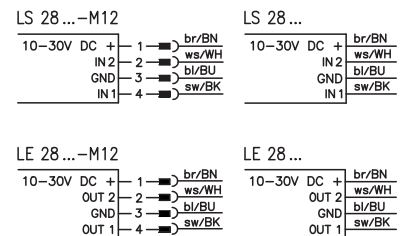
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Transmitter with two deactivation inputs (deact. with HIGH/LOW signal)
- 2 Fast alignment through *brightVision*
- 3 Certification in preparation for the North American market

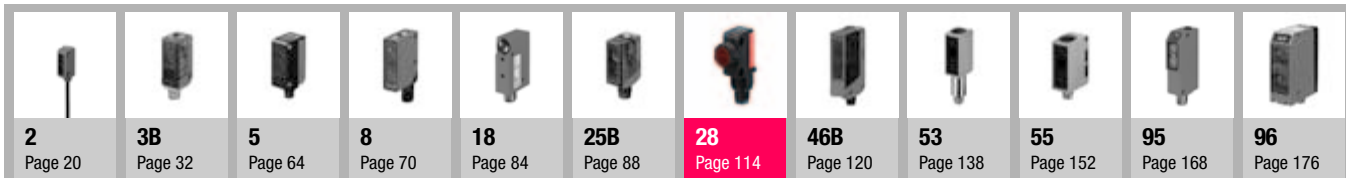
RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 28/4P - M12 50117924	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 28/4P 50117925	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 28/2N - M12 50117926	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2 x NPN/DC	Light/dark antivalent
PRK 28/2N 50117927	0.02 4.5 0.02 6	<input type="checkbox"/>	500Hz	Red light	2 x NPN/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



28 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M12 connector	1, 2	a, b, c, d, e, f	<p>Typ. performance reserve</p> <p>Performance reserve</p> <p>Distance x [m]</p> <p>A TKS 100x100 B TKS 40x60 C TKS 20x40</p>
Cable, 2 m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2 m	1, 2		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection

PRK 28 ...-M12		PRK 28 ...	
10-30V DC +	1	br/BN	10-30V DC +
OUT 2	2	ws/WH	OUT 2
GND	3	bl/BU	GND
OUT 1	4	sw/BK	OUT 1

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Fast alignment through *brightVision*
- 2 Certification in preparation for the North American market

OVERVIEW



Material flow tracking

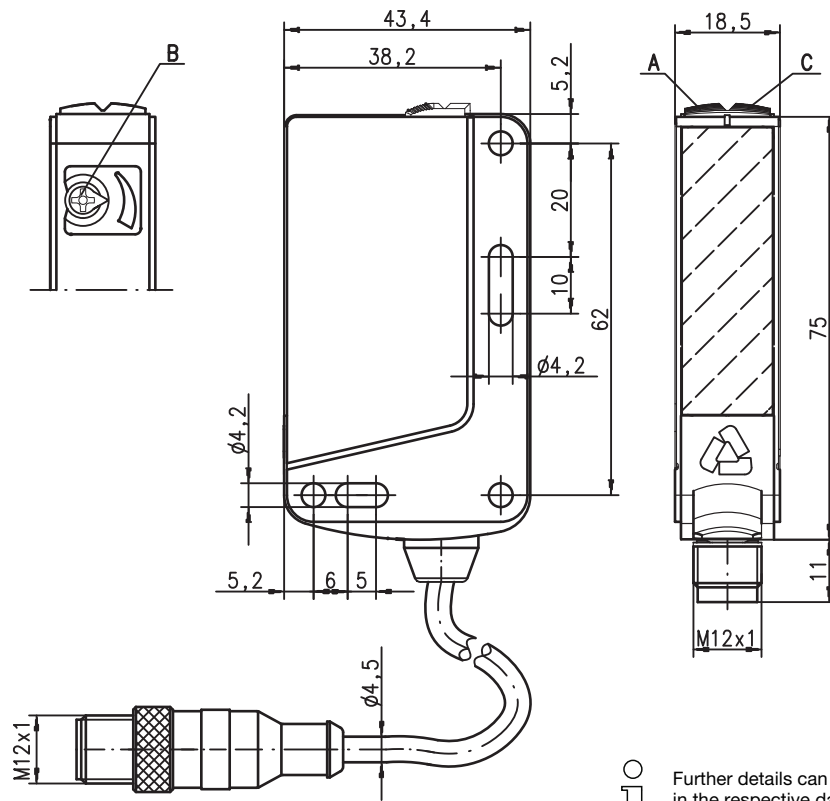


Container detection



Pallet detection

Dimensioned drawing






- A** Green indicator diode
- B** Scanning range adjustment
- C** Yellow indicator diode

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46B SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 <input type="text" value="60"/> m	122
 Retro-reflective sensors	0.05 <input type="text" value="18"/> m	124
 Diffuse reflection scanners	<input type="text" value="10"/> ... 2500 mm	128

Other 46B Series products:

 Protective sensors	SLS 46B	600
 Ex Sensors	PRK 46B ... Ex n, HRT 46B ... Ex n	614



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 30\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Plastic
	Optics cover	Plastic
	Weight (connector/cable)	50g/130g
Environmental data	Ambient temperature (operation)	-40°C ... +60°C Laser: -30°C ... +55°C
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 69K
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 629 onwards

Features

- Active ambient light suppression A²LS
- Good operability from the optics side
- IP 67 and IP 69K
- Highest performance reserve
- Reliable function with shrink-wrapped pallets
- Very bright light spot, indicator diodes visible from all sides



Optical Sensor

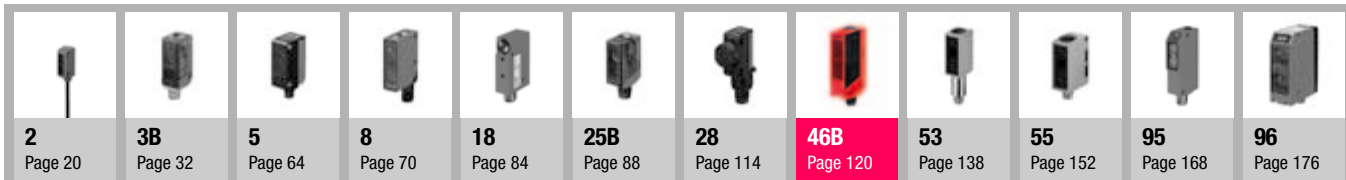
- | | |
|-------------------------------|----------|
| ● Throughbeam sensors | Page 689 |
| ● Retro-reflective sensors | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A ² LS | Page 697 |

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors ▶ = Transmitter ◀ = Receiver						
▶ LSSR 46B - S12 50108526		<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
◀ ILSER 46B/4 - S12 50108536		<input type="checkbox"/>				
▶ LSSR 46B.8 - S12 50108527		<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
◀ ILSER 46B/4 - S12 50108536		<input type="checkbox"/>				
▶ LSSR 46B, 200 - S12 50108528		<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark
◀ LSER 46B/4D, 200 - S12 50119367		<input type="checkbox"/>				
▶ LSSR 46B - S12 50108526		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
◀ LSER 46B/66 - S12 50108532		<input type="checkbox"/>				
▶ LSSR 46B.8 - S12 50108527		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
◀ LSER 46B/66 - S12 50108532		<input type="checkbox"/>				
▶ LSSR 46B - S12 50108526		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
◀ LSER 46B/66.1 - S12 50108533		<input type="checkbox"/>				
▶ LSSR 46B 50108529		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
◀ LSER 46B/66 50108535		<input type="checkbox"/>				
▶ LSSR 46B, 200 - S12 50108528		<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
◀ LSER 46B/66, 200 - S12 50108534		<input type="checkbox"/>				
▶ LSSR 46B - S - S12 50110929		<input type="checkbox"/>	100Hz	Red light	2xPush-pull/DC	Light/dark antivalent
◀ LSER 46B/66 - S - S12 50110930		<input type="checkbox"/>				

We reserve the right to make changes • BR46_LS_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



46B SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	3, 4, 6	a, b, c, d, e, f	
M12 connector	2, 3, 4, 6	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	4, 6	a, b, c, d, e, f	
M12 connector	4, 6	a, b, c, d, e, f	
M12 connector	2, 4, 6	a, b, c, d, e, f	
M12 connector	1, 4, 6	a, b, c, d, e, f	
Cable, 2m	4, 6		
Cable, 0.2m, with M12 connector	4, 6	a, b, c, d, e, f	
M12 connector	4, 5, 6	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical
housing

Measuring
Sensors

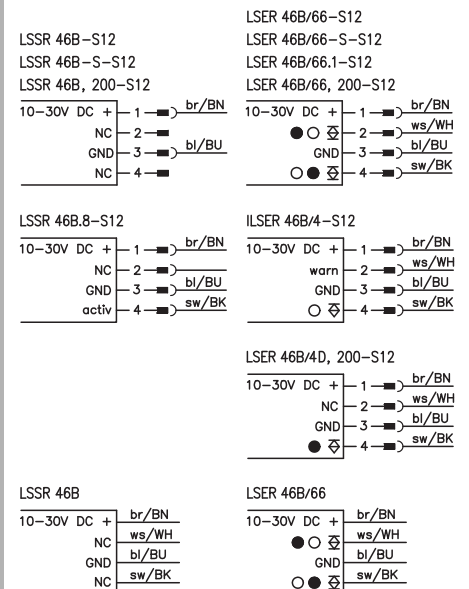
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transmitter with activation input
- 3 Receiver with warning output
- 4 Highly visible, additional LED assists with alignment
- 5 Narrow light beam for preventing reflections caused by shiny objects
- 6 UL approval (class 2 acc. to NEC)

Protective
Sensors

RETRO-REFLECTIVE SENSORS

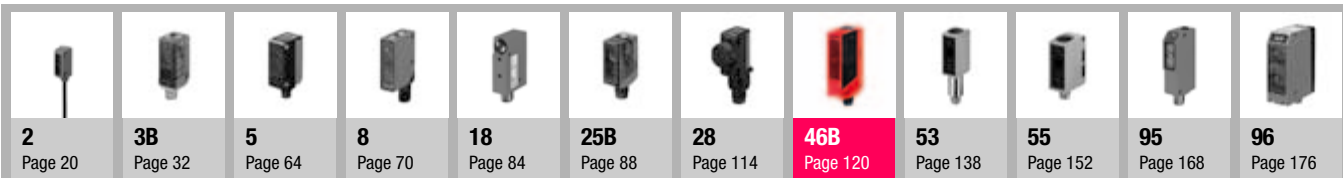
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
IPRK 46B / 4 - S12 50103074	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
PRK 46B / 4D, 200 - S12 50119366	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark
PRK 46B / 44 - S12 50105986	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark
PRK 46B / 66 - S12 50103070	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 46B / 66.01 - S12 50103082	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 46B / 66 50107068	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 46B / 66, 200 - S12 50103071	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 46B / 66D - S12 50113009	0.05 15 0.05 18	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Dark/light antivalent
PRK 46B / 7D - S12 50103080	0.05 15 0.05 18	<input type="checkbox"/>	20Hz	Red light	Relay/make- contact/DC	Dark
PRK 46B / 7D, 5000 50119714	0.05 15 0.05 18	<input type="checkbox"/>	20Hz	Red light	Relay/make- contact/DC	Dark

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR46_PRKB1_EN.fm

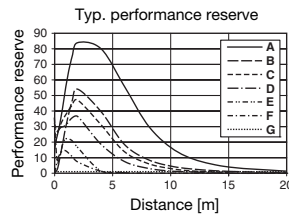


46B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M12 connector	2, 4, 7	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	2, 5, 7	a, b, c, d, e, f	
M12 connector	2, 7	a, b, c, d, e, f	
M12 connector	2, 7	a, b, c, d, e, f	
M12 connector	1, 2, 7	a, b, c, d, e, f	
Cable, 2m	2, 7		
Cable, 0.2m, with M12 connector	2, 7	a, b, c, d, e, f	
M12 connector	2, 7	a, b, c, d, e, f	
M12 connector	2, 7	a, b, c, d, e, f	
Cable, 5m	2, 7		



- A TK 100x100
- B TK 82.2
- C TKS 50x50
- D TKS 40x60
- E TKS 20x40
- F Tape 4 50x50
- G Switching point

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

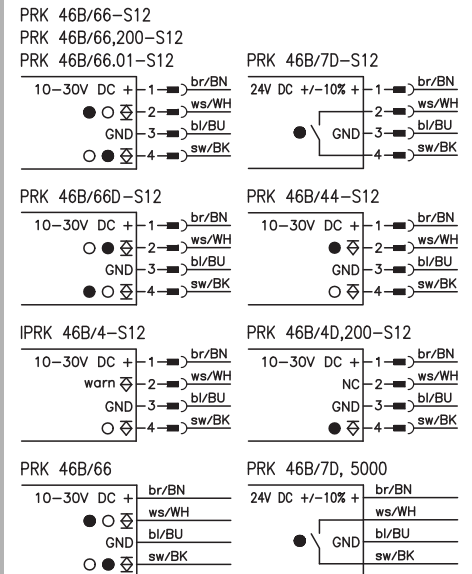
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Fast alignment through *brightVision*
- 3 Activation input
- 4 Warning output
- 5 Direct connection to AS-interface I/O coupling modules
- 6 Highest functional reliability for depolarizing media
- 7 UL approval (class 2 acc. to NEC)

RETRO-REFLECTIVE SENSORS

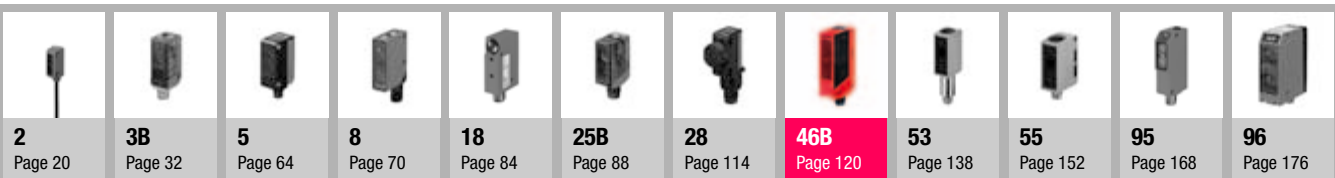
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 46B / 4.82 - S12 50103084	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
IPRK 46B / 4.2 - S12 50103076	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
PRK 46B / 4D.2 - S12 50105987	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark
IPRK 46B / 4D.2 - S12 50111655	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Dark
PRK 46B / 44.2 - S12 50105106	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 46B / 6.2 - S12 50105156	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	Push-pull/DC	PNP/light NPN/dark
PRK 46B / 66.2 - S12 50103072	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 46B / 66.2, 200 - S12 50103073	<input type="text" value="0.1"/> <input type="text" value="8"/> <input type="text" value="0.1"/> <input type="text" value="10"/>	<input type="checkbox"/>	500Hz	Red light	2xPush-pull/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680

We reserve the right to make changes • BR46_PRKB2_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



46B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M12 connector	2, 3, 6, 7	a, b, c, d, e, f	<p>Typ. performance reserve</p> <p>Performance reserve</p> <p>Distance [m]</p> <p>A TK 100x100 B TK 82.2 C TKS 50x50 D TKS 40x60 E Tape 4 50x50 F Switching point</p>
M12 connector	2, 4, 6, 7	a, b, c, d, e, f	
M12 connector	2, 5, 6, 7	a, b, c, d, e, f	
M12 connector	2, 4, 6, 7	a, b, c, d, e, f	
M12 connector	2, 6, 7	a, b, c, d, e, f	
M12 connector	2, 5, 6, 7	a, b, c, d, e, f	
M12 connector	2, 6, 7	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	2, 6, 7	a, b, c, d, e, f	

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

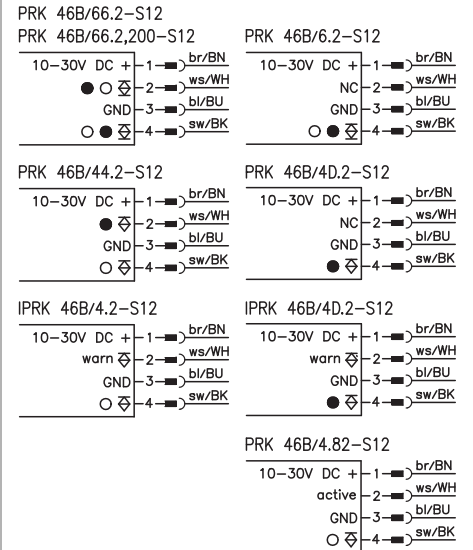


Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Fast alignment through *brightVision*
- 3 Activation input
- 4 Warning output
- 5 Direct connection to AS-interface I/O coupling modules
- 6 Highest functional reliability for depolarizing media, e.g. with pallets that have been stretch-wrapped with foil
- 7 UL approval (class 2 acc. to NEC)

Protective
Sensors

DIFFUSE REFLECTION SCANNERS

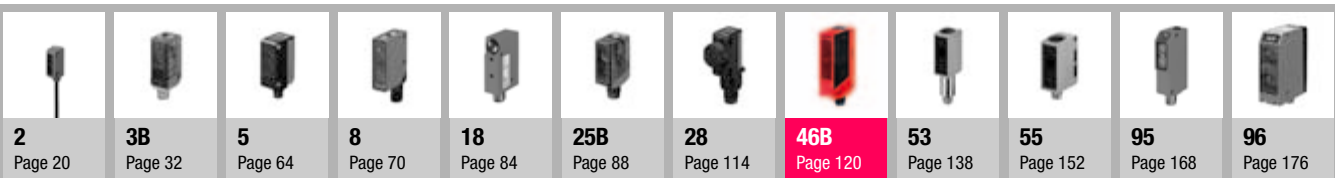
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 46B / 6.22 - S12 50114032		<input type="checkbox"/>	200Hz	Red light	1 x Push-pull/DC	Light/dark reversible
HRTR 46B / 6.22, 200 - S12 50114034		<input type="checkbox"/>	200Hz	Red light	1 x Push-pull/DC	Light/dark reversible
HRTR 46B / L4.23 - S12 50114037		<input type="checkbox"/>	100Hz	Red light	1 x PNP/DC, 1 x push-pull/DC	Light/dark reversible
HRTR 46B / L6.23 - S12 50118554		<input type="checkbox"/>	100Hz	Red light	2 x Push-pull/DC	Light/dark reversible

1) Typical scanning range with a black/white error < 10%

We reserve the right to make changes • BR46_HRTRB1_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



46B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	2, 7, 8	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	2, 7, 8	a, b, c, d, e, f	
M12 connector	3, 4, 7, 8	a, b, c, d, e, f	
M12 connector	3, 4, 7, 8	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

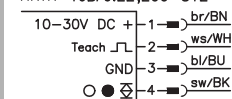
- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

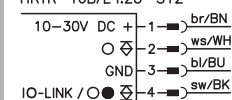
Electrical connection

HRTR 46B/6.22-S12

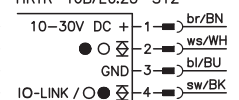
HRTR 46B/6.22,200-S12



HRTR 46B/L4.23-S12



HRTR 46B/L6.23-S12



Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Teach-in via teach button (lockable) or teach input
- 3 2 individually teachable switching outputs
- 4 IO-Link interface with comprehensive configuration and diagnostic options
- 5 Optimized, small light spot for reliable detection of objects with colored structure (focus at approx. 200mm)
- 6 Direct connection to AS-interface I/O coupling modules
- 7 Fast alignment through *brightVision*
- 8 UL approval (class 2 acc. to NEC)

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

DIFFUSE REFLECTION SCANNERS

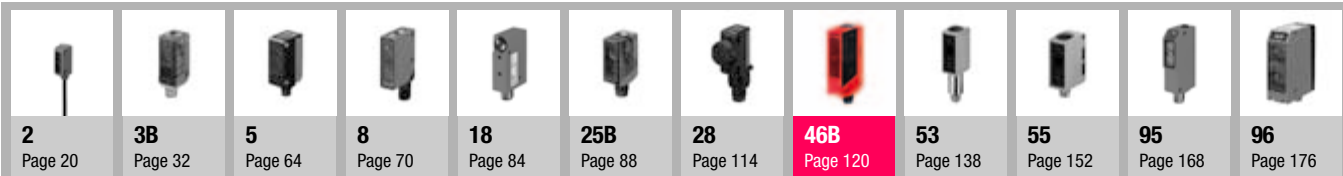
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 46B / 4 - S12 50106557	<input type="text" value="5"/> <input type="text" value="800"/> ¹⁾ <input type="text" value="5"/> <input type="text" value="1800"/>	<input type="checkbox"/>	200Hz	Red light	1xPNP/DC	Light
HRTR 46B / 4D - S12 50106558	<input type="text" value="5"/> <input type="text" value="800"/> ¹⁾ <input type="text" value="5"/> <input type="text" value="1800"/>	<input type="checkbox"/>	200Hz	Red light	1xPNP/DC	Dark
HRTR 46B / 4D, 200 - S12 50113432	<input type="text" value="5"/> <input type="text" value="800"/> ¹⁾ <input type="text" value="5"/> <input type="text" value="1800"/>	<input type="checkbox"/>	200Hz	Red light	1xPNP/DC	Dark
HRTR 46B / 66 - S12 50106555	<input type="text" value="5"/> <input type="text" value="800"/> ¹⁾ <input type="text" value="5"/> <input type="text" value="1800"/>	<input type="checkbox"/>	200Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 46B / 66, 200 - S12 50106556	<input type="text" value="5"/> <input type="text" value="800"/> ¹⁾ <input type="text" value="5"/> <input type="text" value="1800"/>	<input type="checkbox"/>	200Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 46B / 66 - S - S12 50106559	<input type="text" value="5"/> <input type="text" value="500"/> ¹⁾ <input type="text" value="5"/> <input type="text" value="700"/>	<input type="checkbox"/>	200Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 46B / L.221 - S12 50114036	<input type="text" value="200"/> <input type="text" value="500"/> ²⁾	<input type="checkbox"/>	200Hz	Red light	2xPush-pull/DC	Light/dark antivalent

1) Typical scanning range with a black/white error < 10%
2) Distance on fixed background (reference)

We reserve the right to make changes • BR46_HRTRB2_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



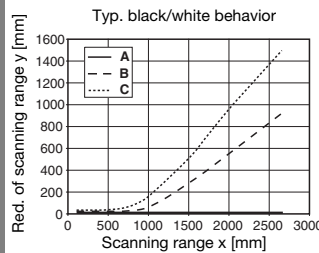
46B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 6, 7, 9	a, b, c, d, e, f	
M12 connector	1, 6, 7, 9	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	1, 6, 7, 9	a, b, c, d, e, f	
M12 connector	1, 7, 9	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	1, 7, 9	a, b, c, d, e, f	
M12 connector	1, 5, 7, 9	a, b, c, d, e, f	
M12 connector	2, 4, 7, 8, 9	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

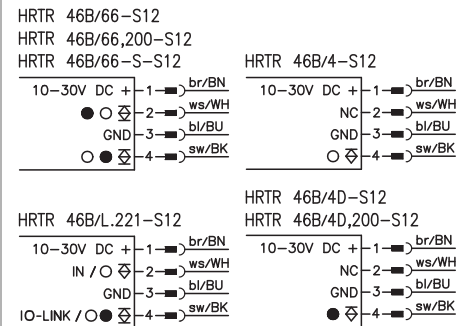
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

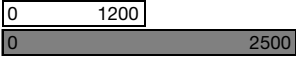
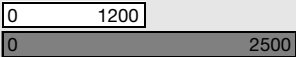
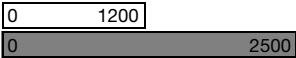
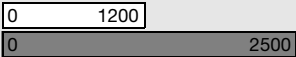
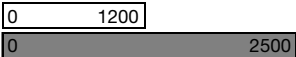
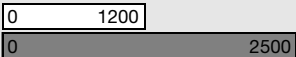
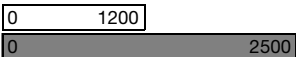
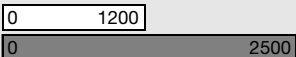
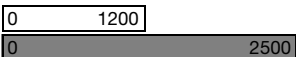
Light
Curtains

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Teach-in via teach button (lockable) or teach input
- 3 2 individually teachable switching outputs
- 4 IO-Link interface with comprehensive configuration and diagnostic options
- 5 Optimized, small light spot for reliable detection of objects with colored structure (focus at approx. 200mm)
- 6 Direct connection to AS-interface I/O coupling modules
- 7 Fast alignment through *brightVision*
- 8 Reference scanner (background is used as fixed reference)
- 9 UL approval (class 2 acc. to NEC)

Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRT 46B / 4 - S12 50106549		<input type="checkbox"/>	200Hz	Infrared light	PNP/DC	Light
IHRT 46B / 4 - S12 50106551		<input type="checkbox"/>	200Hz	Infrared light	PNP/DC	Light
IHRT 46B / 4, 200 - S12 50106553		<input type="checkbox"/>	200Hz	Infrared light	PNP/DC	Light
HRT 46B / 4D - S12 50106550		<input type="checkbox"/>	200Hz	Infrared light	PNP/DC	Dark
IHRT 46B / 4D - S12 50106552		<input type="checkbox"/>	200Hz	Infrared light	PNP/DC	Dark
HRT 46B / 4D, 200 - S12 50109551		<input type="checkbox"/>	200Hz	Infrared light	PNP/DC	Dark
IHRT 46B / 4D, 200 - S12 50106554		<input type="checkbox"/>	200Hz	Infrared light	PNP/DC	Dark
HRT 46B / 44 - S12 50106546		<input type="checkbox"/>	200Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 46B / 44 50114869		<input type="checkbox"/>	200Hz	Infrared light	2xPNP/DC	Light/dark antivalent

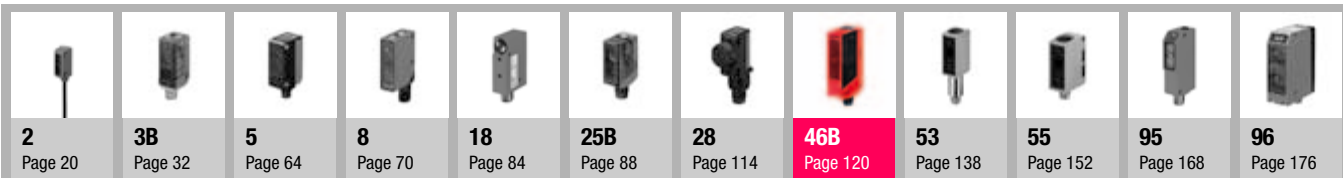
1) Typical scanning range with a black/white error < 10%

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR46_HRTB1_EN.fm



46B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 3, 4, 5	a, b, c, d, e, f	
M12 connector	1, 2, 4, 5	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	1, 2, 4, 5	a, b, c, d, e, f	
M12 connector	1, 3, 4, 5	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
M12 connector	1, 2, 4, 5	a, b, c, d, e, f	
M12 connector	1, 3, 4, 5	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	1, 2, 4, 5	a, b, c, d, e, f	
M12 connector	1, 4, 5	a, b, c, d, e, f	
Cable, 2m	1, 4, 5		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

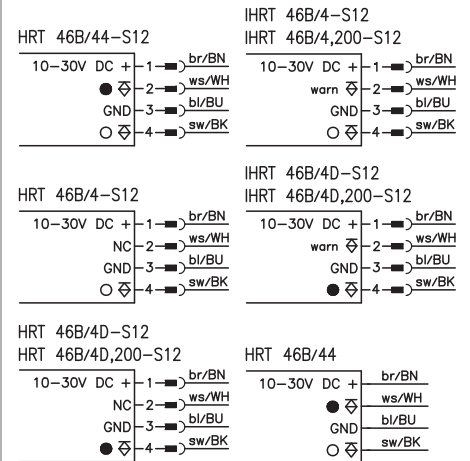
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Warning output
- 3 Direct connection to AS-interface I/O coupling modules
- 4 Reliable detection of light, dark, inclined/sloped surfaces
- 5 UL approval (class 2 acc. to NEC)

Light
Curtains

Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRT 46B / 66 - S12 50106547	0 1200 0 2500		200Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
HRT 46B / 66 50112805	0 1200 0 2500		200Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
HRT 46B / 66, 200 - S12 50106548	0 1200 0 2500		200Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
HRT 46B / 7 - S12 50106562	0 1200 0 2500		20Hz	Infrared light	Relay/make-contact/ DC	Light

1) Typical scanning range with a black/white error < 10%

We reserve the right to make changes • BR46_HRTB2_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	

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46B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 3	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2, 3		
Cable, 0.2m, with M12 connector	1, 2, 3	a, b, c, d, e, f	
M12 connector	1, 2, 3	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

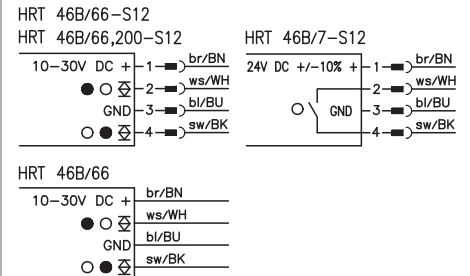
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable detection of light, dark, inclined/sloped surfaces
- 3 UL approval (class 2 acc. to NEC)

www.leuze.com/en/46series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Diffuse reflection scanners with background suppression										
HRT 46B / 66.1 - S12 50111640	<table border="1"><tr><td>20</td><td>800</td></tr><tr><td>10</td><td>1200</td></tr></table>	20	800	10	1200	<input type="checkbox"/>	200Hz	Infrared light	2xPush-pull/DC	Light/dark antivalent
20	800									
10	1200									
Diffuse reflection laser scanners with background suppression										
HRTL 46B / 6.8 - S12 50110806	<table border="1"><tr><td>50</td><td>800</td></tr><tr><td>50</td><td>1200</td></tr></table>	50	800	50	1200	<input type="checkbox"/>	1000Hz	Red light laser class 2	1xPush-pull/DC	Light
50	800									
50	1200									
HRTL 46B / 66 - S12 50106560	<table border="1"><tr><td>50</td><td>800</td></tr><tr><td>50</td><td>1200</td></tr></table>	50	800	50	1200	<input type="checkbox"/>	1000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
50	800									
50	1200									
HRTL 46B / 66, 200 - S12 50106561	<table border="1"><tr><td>50</td><td>800</td></tr><tr><td>50</td><td>1200</td></tr></table>	50	800	50	1200	<input type="checkbox"/>	1000Hz	Red light laser class 2	2xPush-pull/DC	Light/dark antivalent
50	800									
50	1200									
HRTL 46B / 66.1 - S12 50113308	<table border="1"><tr><td>50</td><td>500</td></tr><tr><td>50</td><td>800</td></tr></table>	50	500	50	800	<input type="checkbox"/>	1000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent
50	500									
50	800									

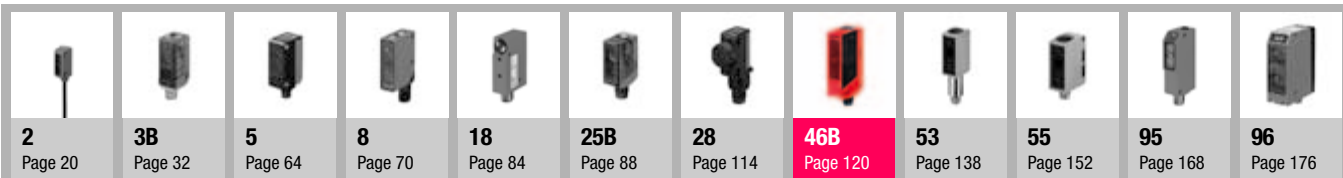
1) Typical scanning range with a black/white error < 10%

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR46_HRTB3_EN.fm



46B SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 3, 7	a, b, c, d, e, f	
M12 connector	1, 4, 6, 7	a, b, c, d, e, f	
M12 connector	1, 4, 7	a, b, c, d, e, f	
Cable, 0.2m, with M12 connector	1, 4, 7	a, b, c, d, e, f	
M12 connector	1, 4, 7	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical
housing

Measuring
Sensors

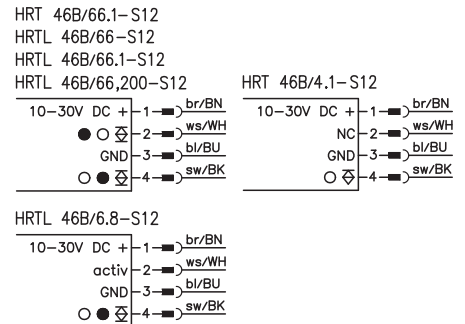
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable detection of objects between the rollers of a roller conveyor (smallest-possible gap: 6mm)
- 3 Reliable detection of light, dark, inclined/sloped surfaces
- 4 Precise positioning and detection of small parts
- 5 Direct connection to AS-interface I/O coupling modules
- 6 Activation input
- 7 UL approval (class 2 acc. to NEC)

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW



Meat processing

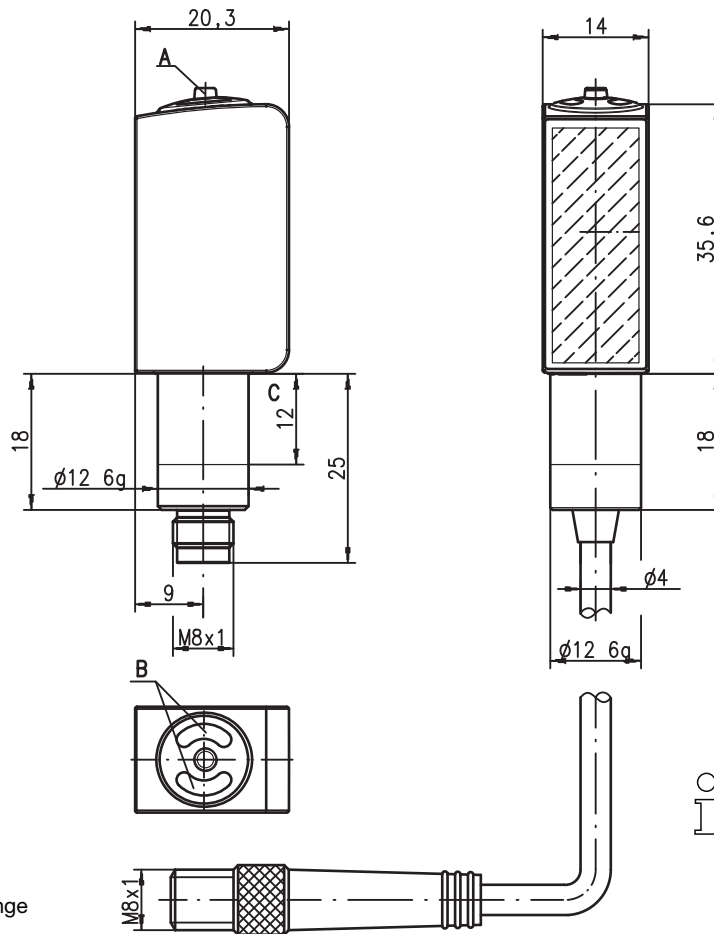


Filling of dairy products



Medical technology

Dimensioned drawing



- A** Operational control
- B** Indicator diodes
- C** Permissible clamping range






Further details can be found in the respective data sheet.

We reserve the right to make changes • BR53_Overview_EN.fm

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53 SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 <input type="text" value="10"/> m	140
 Retro-reflective sensors	0 <input type="text" value="5"/> m	142
 Diffuse reflection scanners	<input type="text" value="5"/> ... 400 mm	148



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 18\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	AISI 316L stainless steel, DIN X2CrNiMo17132, 1.4404, Ra ≤ 2.5
	Housing design	Hygiene design
	Optics cover	Plastic (PMMA)
	Weight (connector/cable)	50g/60g
Environmental data	Ambient temperature ¹⁾ (operation and storage)	-30°C ... +70°C <small>Operating temperatures of +70°C permissible only briefly ($\leq 15\text{min}$).</small>
	VDE safety class	III
	Protection class	IP 67, IP 69K
	Environmental test	ECOLAB, CleanProof+
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 639 onwards

Features

- 316L stainless steel housing in hygiene design
- Scratch resistant and non-diffusive plastic front cover
- Enclosed optics design prevents bacterial carry-overs
- Paperless device identification
- ECOLAB and CleanProof+ tested
- Active ambient light suppression A²LS



Optical Sensor













- | | |
|-------------------------------|----------|
| ● Throughbeam sensors | Page 689 |
| ● Retro-reflective sensors | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A ² LS | Page 697 |

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors ▶ = Transmitter ◀ = Receiver						
▶ LSSR 53.8 - S8 ◀ LSER 53/66 - S8	50108736 50108742	<input type="text" value="0"/> <input type="text" value="8.5"/> <input type="text" value="0"/> <input type="text" value="10"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR53_LSR_EN.fm

Accessories / connection cables			More accessories can be found from page 634 onwards
Part no.	Designation	Features	
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.	
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.	
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.	
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.	

											
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53 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M8 connector	1, 2	a, b, c, d	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

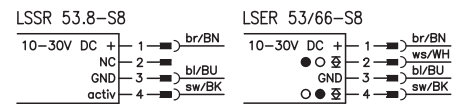
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Transmitter with activation input
- 2 UL approval (class 2 acc. to NEC)













RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Retro-reflective sensors										
RKR 53 / 6.42 - S8 50107607	<table border="1"> <tr> <td>0</td> <td>1.5</td> </tr> <tr> <td>0</td> <td>1.8</td> </tr> </table>	0	1.5	0	1.8	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
0	1.5									
0	1.8									

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680

We reserve the right to make changes • BR53_RKR_EN.fm

Accessories / connection cables			More accessories can be found from page 634 onwards
Part no.	Designation	Features	
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.	
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.	
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.	
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.	
e 50110273	K - D M8W - 4P - 10m - FAB	Connection cable 10000mm, M8 angular, 4-pin, Food+Bev.	
f 50110274	K - D M8A - 4P - 10m - FAB	Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.	

											
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53 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	1, 3, 4, 5	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

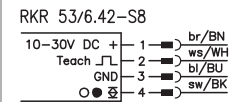
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Transparent media, especially for foils $\leq 20\mu\text{m}$
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

Protective
Sensors

www.leuze.com/en/53series/

RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching						
Retro-reflective sensors with polarization filter												
PRK 53 / 6.22 - S8 50107603	<table border="1"> <tr><td>0</td><td>4</td><td>¹⁾</td></tr> <tr><td>0</td><td>5</td><td>¹⁾</td></tr> </table>	0	4	¹⁾	0	5	¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
0	4	¹⁾										
0	5	¹⁾										
PRK 53 / 6.42 - S8 50112475	<table border="1"> <tr><td>0</td><td>3</td><td>¹⁾</td></tr> <tr><td>0</td><td>3.6</td><td>¹⁾</td></tr> </table>	0	3	¹⁾	0	3.6	¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
0	3	¹⁾										
0	3.6	¹⁾										
PRK 53 / 6D.42 - S8 50112476	<table border="1"> <tr><td>0</td><td>3</td><td>¹⁾</td></tr> <tr><td>0</td><td>3.6</td><td>¹⁾</td></tr> </table>	0	3	¹⁾	0	3.6	¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Dark/light antivalent
0	3	¹⁾										
0	3.6	¹⁾										

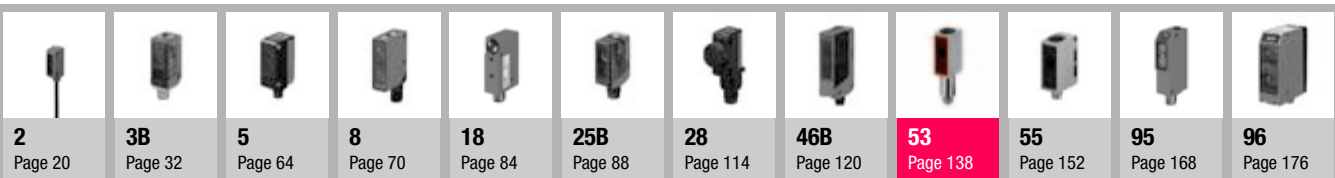
1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680

We reserve the right to make changes • BR53_PRK_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.
e 50110273	K - D M8W - 4P - 10m - FAB	Connection cable 10000mm, M8 angular, 4-pin, Food+Bev.
f 50110274	K - D M8A - 4P - 10m - FAB	Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.



53 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	1, 2, 4, 5	a, b, c, d, e, f	<p>Typ. performance reserve</p> <p>A TK 100x100 B TKS 40x60 C TKS 20x40 D Tape 4: 50x50</p>
M8 connector	1, 3, 4, 5	a, b, c, d, e, f	<p>Typ. performance reserve</p> <p>A TK 100x100 B TKS 40x60 C TKS 20x40 D Tape 4: 50x50</p>
M8 connector	1, 3, 4, 5	a, b, c, d, e, f	<p>Typ. performance reserve</p> <p>A TK 100x100 B TKS 40x60 C TKS 20x40 D Tape 4: 50x50</p>



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

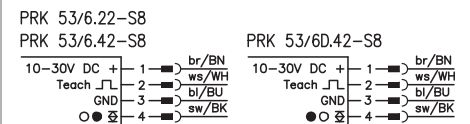
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Teach-in via teach input or lockable teach button
- 2 Precise positioning of objects and reflector markers
- 3 Highly transparent bottles (PET and glass)
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

Protective
Sensors

www.leuze.com/en/53series/













RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching						
Retro-reflective laser sensors with polarization filter												
PRKL 53 / 6.22 - S8 50107605	<table border="1"> <tr> <td>0</td> <td>2</td> <td>¹⁾</td> </tr> <tr> <td>0</td> <td>3</td> <td>¹⁾</td> </tr> </table>	0	2	¹⁾	0	3	¹⁾		2000Hz	Red light laser class 1	Push-pull/DC	Light/dark antivalent
0	2	¹⁾										
0	3	¹⁾										

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 680

We reserve the right to make changes • BR53_PRKL_EN.fm

Accessories / connection cables			More accessories can be found from page 634 onwards
Part no.	Designation	Features	
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.	
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.	
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.	
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.	
e 50110273	K - D M8W - 4P - 10m - FAB	Connection cable 10000mm, M8 angular, 4-pin, Food+Bev.	
f 50110274	K - D M8A - 4P - 10m - FAB	Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.	

											
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53 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	1, 2, 3, 4	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

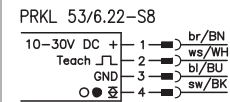
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Teach-in via teach input or lockable teach button
- 2 Detection of small parts and very fast events
- 3 Autocollimation principle
- 4 UL approval (class 2 acc. to NEC)

www.leuze.com/en/53series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression					
HRTR 53 / 6 - S8.3 50107500		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
HRTR 53 / 66 - S8 50107499		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 53 / 6 - S - S8.3 50107504		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
HRTR 53 / 66 - S - S8 50107503		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 53 / 6 - XL - S8.3 50107508		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
HRTR 53 / 66 - XL - S8 50107507		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

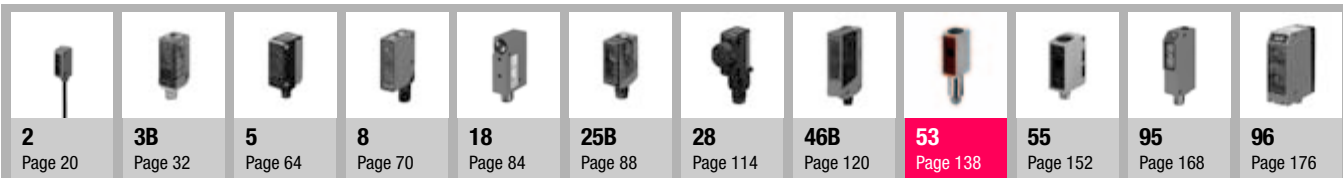
1) Typical scanning range with a black/white error < 10%

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.
d 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.
e 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.
f 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.

We reserve the right to make changes • BR53_HRTR1_EN.fm



53 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 6	a, b	<p>Typ. black/white behavior</p>
M8 connector	1, 2, 6	c, d, e, f	
M8 connector	1, 3, 4, 6	a, b	<p>Typ. black/white behavior</p>
M8 connector	1, 3, 4, 6	c, d, e, f	
M8 connector	1, 5, 6	a, b	<p>Typ. black/white behavior</p>
M8 connector	1, 5, 6	c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection

HRTR 53/66-S8	HRTR 53/6-S8.3
HRTR 53/66-S-S8	HRTR 53/6-S-S8.3
HRTR 53/66-XL-S8	HRTR 53/6-XL-S8.3
10-30V DC + 1 — br/BN ● ⊗ 2 — ws/WH GND — 3 — bi/BU ○ ⊗ 4 — sw/BK	10-30V DC + 1 — br/BN GND — 3 — bi/BU ○ ⊗ 4 — sw/BK

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 Reliable switching even on glossy objects and objects with colored structure
- 4 Small, homogeneous light spot for detecting small parts
- 5 Broad rectangular light spot guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 6 UL approval (class 2 acc. to NEC)

www.leuze.com/en/53series/

DIFFUSE REFLECTION SCANNERS













Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with V-optics and background suppression					
HRTR 53 / 66 - V - S8 50120622		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
Diffuse reflection laser scanners with background suppression					
HRTL 53 / 66 - S8 50115203		2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent
HRTL 53 / 66, 5000 50115202		2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent

1) Typical scanning range with a black/white error < 10%

We reserve the right to make changes • BR53_HRTL_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.
e 50110273	K - D M8W - 4P - 10m - FAB	Connection cable 10000mm, M8 angular, 4-pin, Food+Bev.
f 50110274	K - D M8A - 4P - 10m - FAB	Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.

											
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53 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 3, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 5 m	1, 2, 4		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

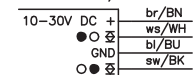
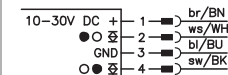
Inductive
Switches

Electrical connection

HRTR 53/66-V-S8

HRTL 53/66-S8

HRTL 53/66, 5000



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Small, homogeneous light spot for detecting small parts
- 3 V-optics, detection of very shiny, polished surfaces and of transparent objects in a range of 30 ... 70mm
- 4 UL approval (class 2 acc. to NEC)

www.leuze.com/en/53series/

OVERVIEW



Filling of food containers

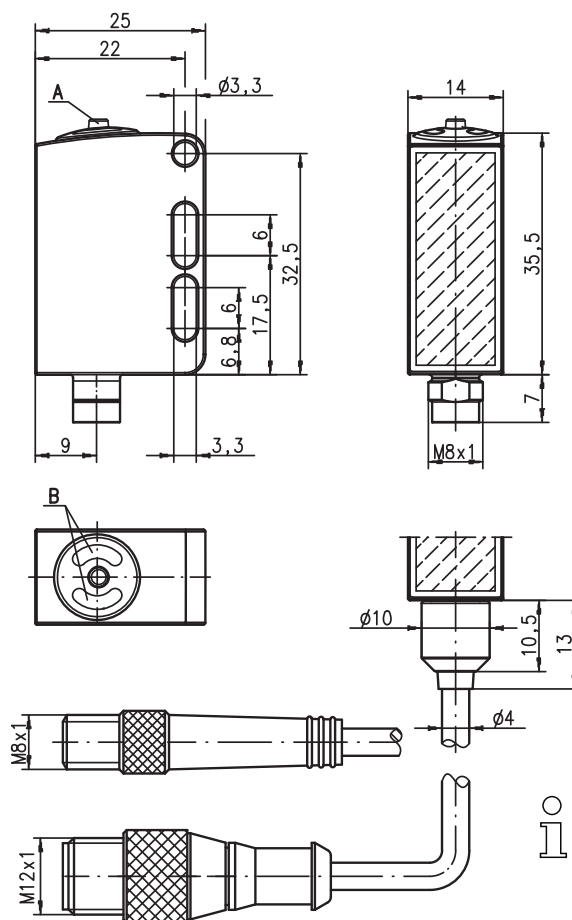


Detection of baked goods




Filling of beverage containers













Dimensioned drawing






- A** Operational control
- B** Indicator diodes

 Further details can be found in the respective data sheet.

We reserve the right to make changes • BR55_Overview_EN.fm

											
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55 SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 <input type="text" value="10"/> m	154
 Retro-reflective sensors	0 <input type="text" value="6"/> m	156
 Diffuse reflection scanners	<input type="text" value="5"/> ... 400 mm	162



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 18\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2V) / \leq 2V$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	AISI 316L stainless steel, DIN X2CrNiMo17132, 1.4404, Ra ≤ 2.5
	Housing design	WASH-DOWN-Design
	Optics cover	Plastic (PMMA)
	Weight (connector/cable)	40g/60g
Environmental data	Ambient temp. (operation and storage)	-30°C ... +70°C <small>Operating temperatures of +70°C permissible only briefly ($\leq 15\text{min}$).</small>
	VDE safety class	III
	Protection class	IP 67, IP 69K
	Environmental test	ECOLAB, CleanProof+
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 629 onwards

Features

- 316L stainless steel housing in Wash-Down-Design
- Scratch resistant and non-diffusive plastic front cover
- Enclosed optics design prevents bacterial carry-overs
- Paperless device identification
- ECOLAB and CleanProof+ tested
- Active ambient light suppression A²LS



Optical Sensor

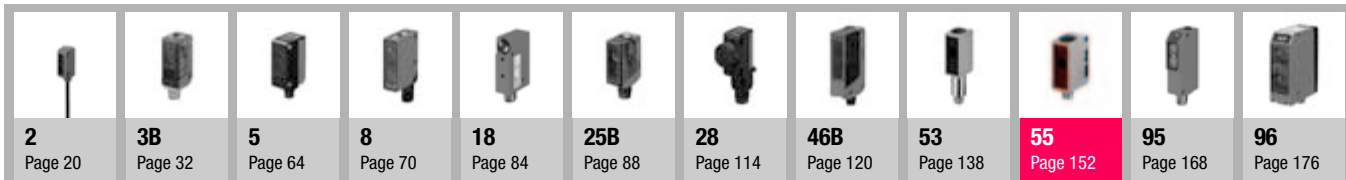
- | | |
|-------------------------------|----------|
| ● Throughbeam sensors | Page 689 |
| ● Retro-reflective sensors | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A ² LS | Page 697 |

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors ▶ = Transmitter ◀ = Receiver						
▶ LSSR 55.8 - S8 ◀ LSER 55/66 - S8	50108715 50108721	 	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 55.8, 200 - S12 ◀ LSER 55/66, 200 - S12	50108717 50108723	 	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
▶ LSSR 55.8, 5000 ◀ LSER 55/66, 5000	50111969 50111970	 	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

We reserve the right to make changes • BR55_LSR_EN.fm

Accessories / connection cables			More accessories can be found from page 634 onwards
Part no.	Designation	Features	
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.	
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.	
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.	
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.	
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.	
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.	



55 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M8 connector	1, 2	a, b, c, d	
Cable 0.2m, with M12 connector	1, 2	e, f	
Cable 5m	1, 2		



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

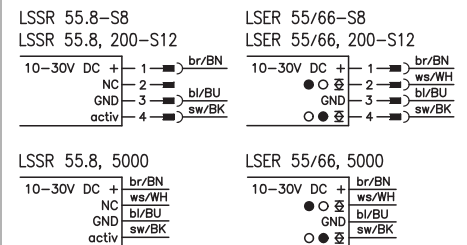
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Transmitter with activation input
- 2 UL approval (class 2 acc. to NEC)

www.leuze.com/en/55series/

RETRO-REFLECTIVE SENSORS

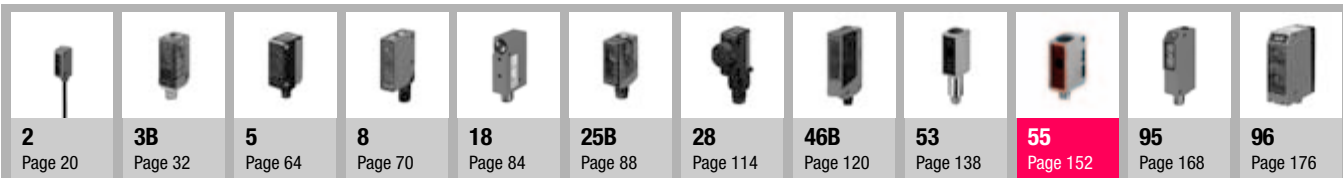
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors						
RKR 55 / 6.42 - S8.3 50107601	<input type="text" value="0"/> <input type="text" value="1.5"/> <input type="text" value="0"/> <input type="text" value="1.8"/>		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
RKR 55 / 6.42 - S8 50105794	<input type="text" value="0"/> <input type="text" value="1.5"/> <input type="text" value="0"/> <input type="text" value="1.8"/>		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
RKR 55 / 6.42, 5000 50114073	<input type="text" value="0"/> <input type="text" value="1.5"/> <input type="text" value="0"/> <input type="text" value="1.8"/>		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
RKR 55 / 6.42, 200 - S12 50105795	<input type="text" value="0"/> <input type="text" value="1.5"/> <input type="text" value="0"/> <input type="text" value="1.8"/>		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
Retro-reflective sensors with polarization filter						
PRK 55 / 6 - S8.3 50107600	<input type="text" value="0.02"/> <input type="text" value="5"/> <input type="text" value="0.02"/> <input type="text" value="6"/>		1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 66 - S8 50105804	<input type="text" value="0.02"/> <input type="text" value="5"/> <input type="text" value="0.02"/> <input type="text" value="6"/>		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 55 / 66, 200 - S12 50105805	<input type="text" value="0.02"/> <input type="text" value="5"/> <input type="text" value="0.02"/> <input type="text" value="6"/>		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
PRK 55 / 66, 5000 50111966	<input type="text" value="0.02"/> <input type="text" value="5"/> <input type="text" value="0.02"/> <input type="text" value="6"/>		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 681

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.

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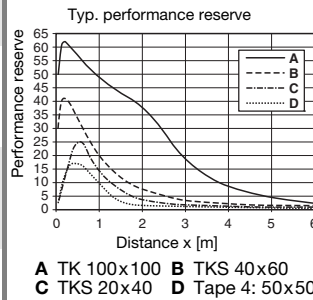


55 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	2, 3, 4, 5	a, b	
M8 connector	1, 3, 4, 5	c, d	
Cable 5m	1, 3, 4, 5		
Cable 0.2m, with M12 connector	1, 3, 4, 5	e, f	
M8 connector	5	a, b	
M8 connector	5	c, d	
Cable 0.2m, with M12 connector	5	e, f	
Cable 5m	5		



A TK 100x100 **B** TKS 40x60
C TKS 20x40 **D** Tape 4: 50x50



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

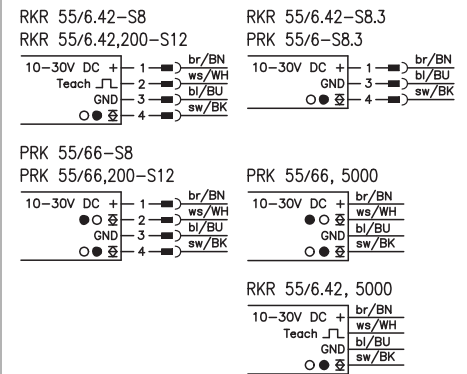
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Transparent media, especially for foils $\leq 20\mu\text{m}$
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

www.leuze.com/en/55series/

RETRO-REFLECTIVE SENSORS

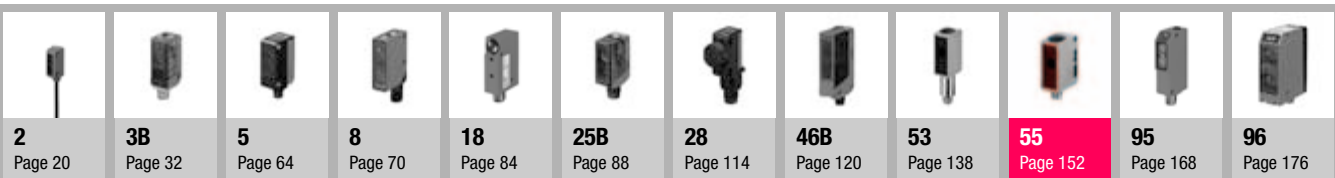
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 55 / 6.22 - S8.3 50107599	<input type="text" value="0"/> <input type="text" value="4"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="5"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 6.22 - S8 50105792	<input type="text" value="0"/> <input type="text" value="4"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="5"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 6.22, 5000 50111967	<input type="text" value="0"/> <input type="text" value="4"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="5"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 6.22, 200 - S12 50105793	<input type="text" value="0"/> <input type="text" value="4"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="5"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 6.42 - S8 50112991	<input type="text" value="0"/> <input type="text" value="3"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="3.6"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 6.42, 5000 50114071	<input type="text" value="0"/> <input type="text" value="3"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="3.6"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 6.42, 200 - S12 50112477	<input type="text" value="0"/> <input type="text" value="3"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="3.6"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Light/dark antivalent
PRK 55 / 6D.42 - S8 50112992	<input type="text" value="0"/> <input type="text" value="3"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="3.6"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Dark/light antivalent
PRK 55 / 6D.42, 200 - S12 50112478	<input type="text" value="0"/> <input type="text" value="3"/> ¹⁾ <input type="text" value="0"/> <input type="text" value="3.6"/> ¹⁾	<input type="checkbox"/>	1000Hz	Red light	Push-pull/DC	Dark/light antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 681

We reserve the right to make changes • BR55_PRK1_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.



55 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	2, 3, 5, 6	a, b	<p>Typ. performance reserve</p> <p>Performance reserve vs Distance [m]</p> <p>A TK 100x100 B TKS 40x60 C TKS 20x40 D Tape 4: 50x50</p>
M8 connector	1, 3, 5, 6	c, d	
Cable 5m	1, 3, 5, 6		<p>Typ. performance reserve</p> <p>Performance reserve vs Distance [m]</p> <p>A TK 100x100 B TKS 40x60 C TKS 20x40 D Tape 4: 50x50</p>
Cable 0.2m, with M12 connector	1, 3, 5, 6	e, f	
M8 connector	1, 4, 5, 6	c, d	<p>Typ. performance reserve</p> <p>Performance reserve vs Distance [m]</p> <p>A TK 100x100 B TKS 40x60 C TKS 20x40 D Tape 4: 50x50</p>
Cable 5m	1, 4, 5, 6		
Cable 0.2m, with M12 connector	1, 4, 5, 6	e, f	<p>Typ. performance reserve</p> <p>Performance reserve vs Distance [m]</p> <p>A TK 100x100 B TKS 40x60 C TKS 20x40 D Tape 4: 50x50</p>
M8 connector	1, 4, 5, 6	c, d	
Cable 0.2m, with M12 connector	1, 4, 5, 6	e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

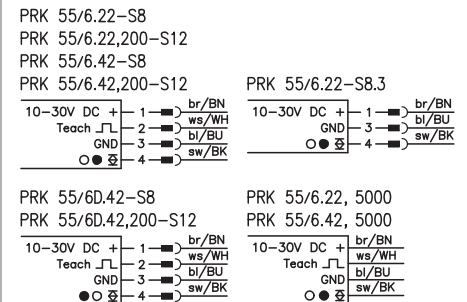
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Precise positioning of objects and reflector markers
- 4 Highly transparent bottles (PET and glass)
- 5 Autocollimation principle
- 6 UL approval (class 2 acc. to NEC)

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RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective laser sensors with polarization filter						
PRKL 55 / 6.22 - S8.3 50107602	0 <input type="text" value="2"/> 2 0 <input type="text" value="3"/> 3	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark antivalent
PRKL 55 / 6.22 - S8 50105796	0 <input type="text" value="2"/> 2 0 <input type="text" value="3"/> 3	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark antivalent
PRKL 55 / 6.22, 5000 50114072	0 <input type="text" value="2"/> 2 0 <input type="text" value="3"/> 3	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark antivalent
PRKL 55 / 6.22, 200 - S12 50105797	0 <input type="text" value="2"/> 2 0 <input type="text" value="3"/> 3	<input type="checkbox"/>	2000Hz	Red light laser class 1	Push-pull/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 681

We reserve the right to make changes • BR55_PRKL_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC	
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC	
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.	
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.	
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.	
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.	

											
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55 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. performance reserve
M8 connector	2, 3, 4, 5	a, b	
M8 connector	1, 3, 4, 5	c, d	
Cable 5m	1, 3, 4, 5		
Cable 0.2m, with M12 connector	1, 3, 4, 5	e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

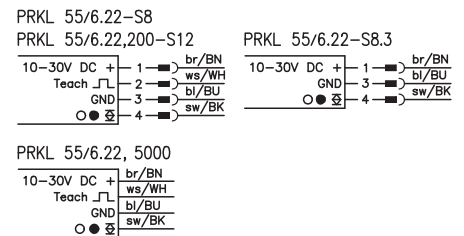
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Detection of small parts and very fast events
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

www.leuze.com/en/55series/

DIFFUSE REFLECTION SCANNERS

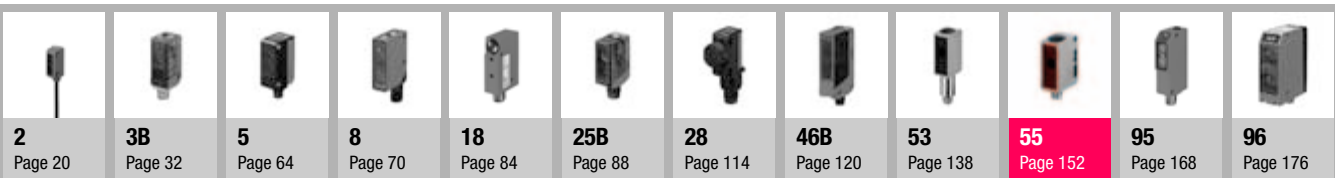
Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 55 / 66 - S8 50107484		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 55 / 66, 5000 50111968		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 55 / 66, 200 - S12 50107492		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 55 / 66 - S - S8 50107493		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 55 / 66 - S, 5000 50114069		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 55 / 66 - S, 200 - S12 50107495		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

1) Typical scanning range with a black/white error < 10%

We reserve the right to make changes • BR55_HRTR1_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.



55 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 6	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 5 m	1, 2, 6		
Cable, 0.2 m, with M12 connector	1, 2, 6	e, f	<p>Typ. black/white behavior</p>
M8 connector	1, 3, 4, 6	a, b, c, d	
Cable, 5 m	1, 3, 4, 6		<p>Typ. black/white behavior</p>
Cable, 0.2 m, with M12 connector	1, 3, 4, 6	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

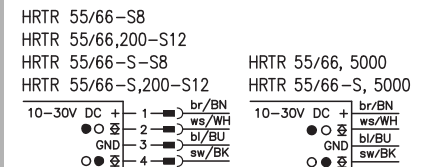
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 Reliable switching even on glossy objects and objects with colored structure
- 4 Small, homogeneous light spot for detecting small parts
- 5 Broad rectangular light spot guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 6 UL approval (class 2 acc. to NEC)

Protective
Sensors

www.leuze.com/en/55series/

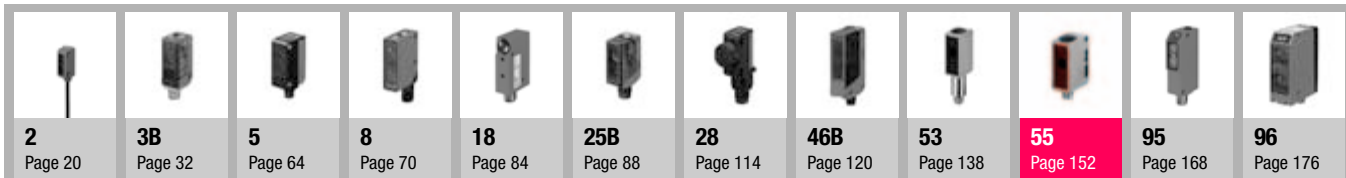
DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with background suppression						
HRTR 55 / 44 - XL, 5000 50116828	<input type="checkbox"/> 5 60 <input type="checkbox"/> 5 100		1000Hz	Red light	2xPNP/DC	Light/dark antivalent
HRTR 55 / 22 - XL, 5000 50117199	<input type="checkbox"/> 5 60 <input type="checkbox"/> 5 100		1000Hz	Red light	2xNPN/DC	Light/dark antivalent
HRTR 55 / 66 - XL - S8 50107496	<input type="checkbox"/> 5 60 <input type="checkbox"/> 5 100		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 55 / 66 - XL, 5000 50114070	<input type="checkbox"/> 5 60 <input type="checkbox"/> 5 100		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 55 / 66 - XL, 200 - S12 50107498	<input type="checkbox"/> 5 60 <input type="checkbox"/> 5 100		1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

1) Typical scanning range with a black/white error < 10%

We reserve the right to make changes • BR55_HRTR2_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.	
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.	
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.	
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.	
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.	
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.	



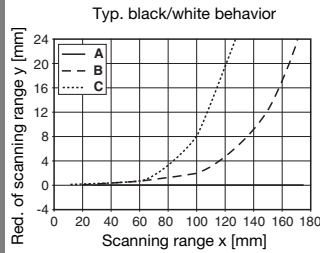
55 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 5 m	1, 5, 6		
Cable, 5 m	1, 5, 6		
M8 connector	1, 5, 6	a, b, c, d	
Cable, 5 m	1, 5, 6		
Cable, 0.2m, with M12 connector	1, 5, 6	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

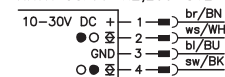
- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

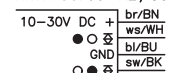
Electrical connection

HRTR 55/66-XL-S8

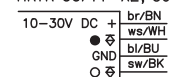
HRTR 55/66-XL,200-S12



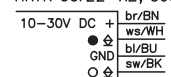
HRTR 55/66-XL, 5000



HRTR 55/44-XL, 5000



HRTR 55/22-XL, 5000



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors


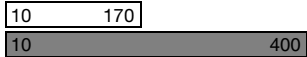
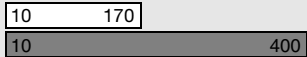
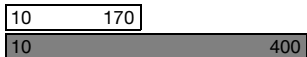
Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 Reliable switching even on glossy objects and objects with colored structure
- 4 Small, homogeneous light spot for detecting small parts
- 5 Broad rectangular light spot guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 6 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

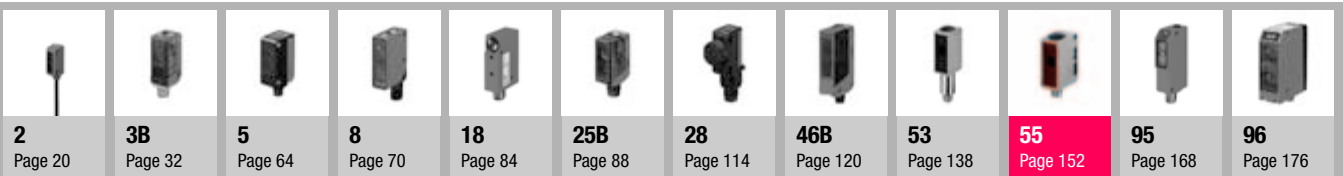
Part description Part No.:	Scanning range ¹⁾ [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners with V-optics and background suppression						
HRTR 55 / 66 - V, 200 - S12 50120623		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
Diffuse reflection laser scanners with background suppression						
HRTL 55 / 66 - S8 50115206		<input type="checkbox"/>	2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent
HRTL 55 / 66, 5000 50115205		<input type="checkbox"/>	2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent
HRTL 55 / 66, 200 - S12 50115204		<input type="checkbox"/>	2000Hz	Red light laser class 1	2xPush-pull/DC	Light/dark antivalent

1) Typical scanning range with a black/white error < 10%

We reserve the right to make changes • BR55_HRTL_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50106154	K - D M8W - 4P - 2m - FAB	Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.
b 50106152	K - D M8A - 4P - 2m - FAB	Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.
c 50106155	K - D M8W - 4P - 5m - FAB	Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.
d 50106153	K - D M8A - 4P - 5m - FAB	Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.



55 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
Cable, 0.2m, with M12 connector	1, 3, 4	e, f	<p>Typ. black/white behavior</p>
			<p>A white 90% B gray 18% C black 6%</p>
M8 connector	1, 2, 4	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 5m	1, 2, 4		
Cable, 0.2m, with M12 connector	1, 2, 4	e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive
Switches

Electrical connection

HRTR 55/66-V,200-S12		HRTL 55/66, 5000
HRTL 55/66-S8		
HRTL 55/66,200-S12		
10-30V DC + 1	br/BN	10-30V DC +
○ 2	ws/WH	○ 2
● 3	bl/BU	● 3
GND - 3	sw/BK	GND
○ 4		○ 4

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Small, homogeneous light spot for detecting small parts
- 3 V-optics, detection of very shiny, polished surfaces and of transparent objects in a range of 30 ... 70mm
- 4 UL approval (class 2 acc. to NEC)

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OVERVIEW



Cover control

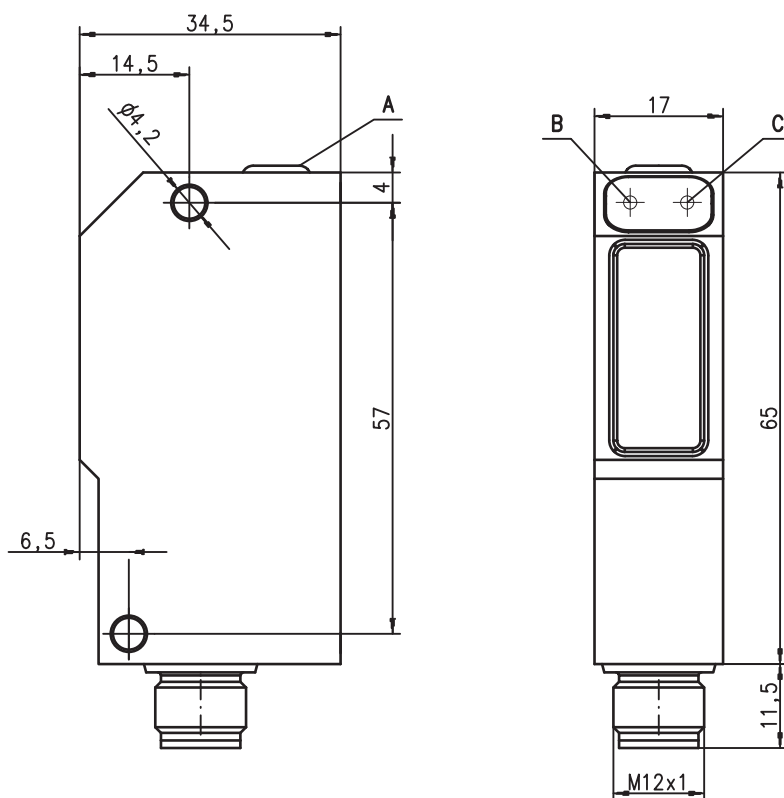


Product separation



Postpress applications

Dimensioned drawing






Further details can be found in the respective data sheet.

- A** Scanning range adjustment
- B** Yellow switching indicator
- C** Green operation indicator


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2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

95 SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 <input type="text" value="20"/> m	170
 Retro-reflective sensors	0 <input type="text" value="9"/> m	172
 Diffuse reflection scanners	<input type="text" value="10"/> ... 900 mm	174

Other 95 Series products:

 AS-interface sensors	PRK 95	624
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Common technical data

Electrical data	Operating voltage U_B	10(18) ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Diecast zinc
	Optics cover	Glass
	M12 connector	Stainless steel
	Weight	90g
Environmental data	Ambient temperature (operation)	$-30^\circ\text{C} \dots +55^\circ\text{C}$
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 69K
	Standards applied	IEC 60947-5-2, UL 508

Features

- Metal housing
- Glass optics
- IP 67 and IP 69K
- Active ambient light suppression A²LS
- Detection of PET, foil, and glass



Optical Sensor

- | | |
|-------------------------------|----------|
| ● Throughbeam sensors | Page 689 |
| ● Retro-reflective sensors | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A ² LS | Page 697 |

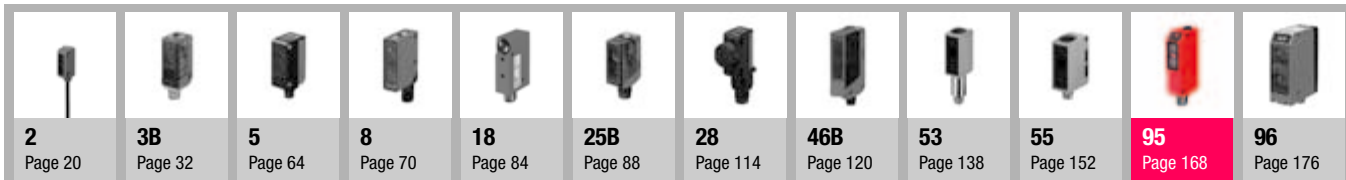
Mounting systems for this series can be found from page 639 onwards

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors ▶ = Transmitter ◀ = Receiver						
▶ LSR 95 / 2.8 SE - L.1 50034509	<input type="text" value="0"/> <input type="text" value="12"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
◀ ILSR 95 / 44 E - L.1 50034510	<input type="text" value="0"/> <input type="text" value="18"/>	<input type="checkbox"/>				
▶ LS 95 / 2.8 SE - L.1 50026835	<input type="text" value="0"/> <input type="text" value="12"/>	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
◀ ILS 95 / 44 E - L.1 50026836	<input type="text" value="0"/> <input type="text" value="20"/>	<input type="checkbox"/>				

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC	
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC	
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC	
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC	
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC	
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC	



95 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	
M12 connector	2, 3, 4	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

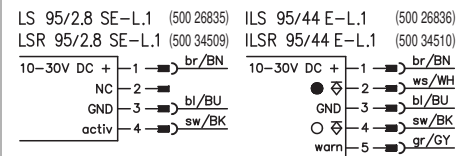
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Transmitter with activation input
- 3 Receiver with warning output
- 4 UL approval

www.leuze.com/en/95series/

RETRO-REFLECTIVE SENSORS

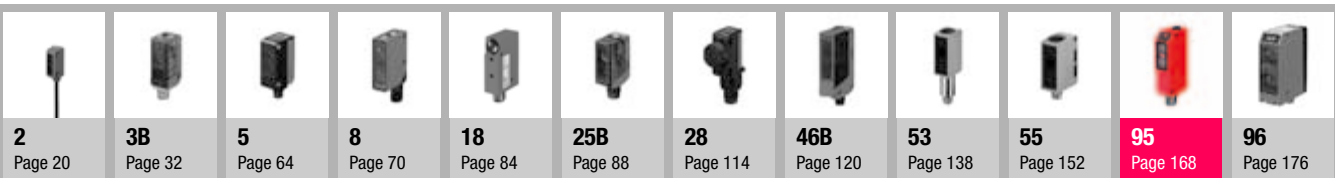
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors with polarization filter						
PRK 95 / 44 L 50034511	<input type="text" value="0.2"/> <input type="text" value="6"/> <input type="text" value="0.2"/> <input type="text" value="9"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
IPRK 95 / 44 L.5 50034512	<input type="text" value="0.2"/> <input type="text" value="6"/> <input type="text" value="0.2"/> <input type="text" value="9"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
IPRK 95 / 4.8 L.2 50030257	<input type="text" value="0"/> <input type="text" value="4.2"/> <input type="text" value="0"/> <input type="text" value="6"/>	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light
IPRK 95 / 44 L.2 50022680	<input type="text" value="0"/> <input type="text" value="4.2"/> <input type="text" value="0"/> <input type="text" value="6"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
IPRK 95 / 44 L.21 50102613	<input type="text" value="0"/> <input type="text" value="4.2"/> <input type="text" value="0"/> <input type="text" value="6"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 95 / 4 L.2 50027993	<input type="text" value="0"/> <input type="text" value="3.4"/> <input type="text" value="0"/> <input type="text" value="5"/>	<input type="checkbox"/>	200Hz	Red light	PNP/DC	Light
IPRK 95 / 44 L.3 50022681	<input type="checkbox"/> 0 ... 0.3 (with refl. tape 4, 10x10) <input type="checkbox"/> 0 ... 0.3 (with refl. tape 4, 10x10)	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 95 / 44 L.4 50025609	<input type="text" value="0"/> <input type="text" value="1.8"/> <input type="text" value="0"/> <input type="text" value="3"/>	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 681

We reserve the right to make changes • BR95_IPRK_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC



95 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	8	a, b, c, d	
M12 connector	1, 5, 8	e, f	
M12 connector	3, 4, 5, 8	e, f	
M12 connector	3, 5, 8	e, f	
M12 connector	1, 3, 5, 8	e, f	
M12 connector	3, 6, 8	a, b, c, d	
M12 connector	3, 5, 7, 8	e, f	
M12 connector	1, 2, 3, 8	a, b, c, d	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

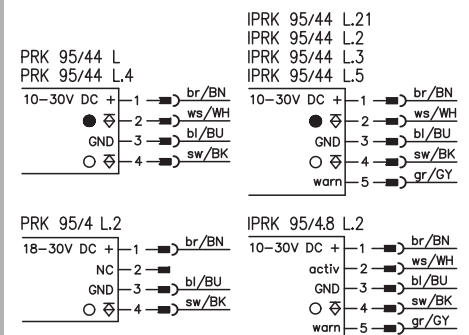
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Transparent media
- 3 Autocollimation principle
- 4 Activation input
- 5 Warning output
- 6 Direct connection to AS-interface I/O coupling modules
- 7 Focus at 100mm
- 8 UL approval

www.leuze.com/en/95series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners						
RKR 95 / 44 - 600 L 50034513		<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
IRKR 95 / 44 - 250 L 50025612		<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
IRK 95 / 44 - 250 L 50025611		<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
Diffuse reflection scanners with background suppression						
FRKR 95 / 44 - 350 L 50034514		<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
FRK 95 / 44 - 350 L 50034515		<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
FRKR 95 / 44 - 150 L 50025610		<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
FRK 95 / 44 - 150 L 50019925		<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
FRK 95 / 22 - 150 L 50022794		<input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
b 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC

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2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

95 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 5	a, b	<p>Typ. black/white behavior</p>
M12 connector	1, 2, 5	c, d	<p>Typ. black/white behavior</p>
M12 connector	1, 2, 5	c, d	<p>Typ. black/white behavior</p>
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 4, 5	a, b	<p>Typ. black/white behavior</p>
M12 connector	1, 3, 5	a, b	<p>Typ. black/white behavior</p>
M12 connector	1, 4, 5	a, b	<p>Typ. black/white behavior</p>
M12 connector	1, 5	a, b	<p>Typ. black/white behavior</p>
M12 connector	1, 5	a, b	<p>Typ. black/white behavior</p>



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

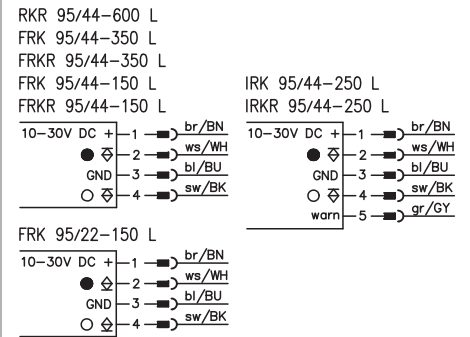
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Options

- 1 Scanning range adjustment via potentiometer/multiturn potentiometer
- 2 Warning output
- 3 Shiny/inclined surfaces
- 4 Focused light beam
- 5 UL approval

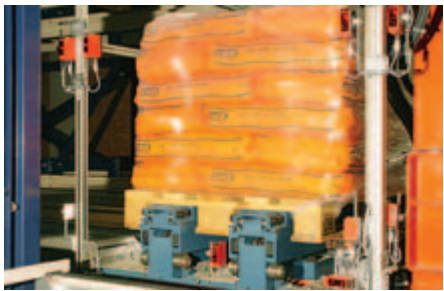
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

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OVERVIEW



Compartment occupancy monitoring



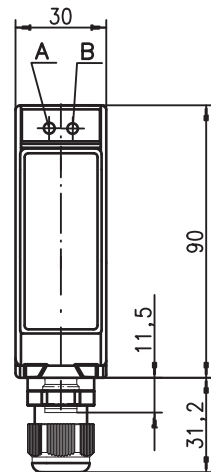
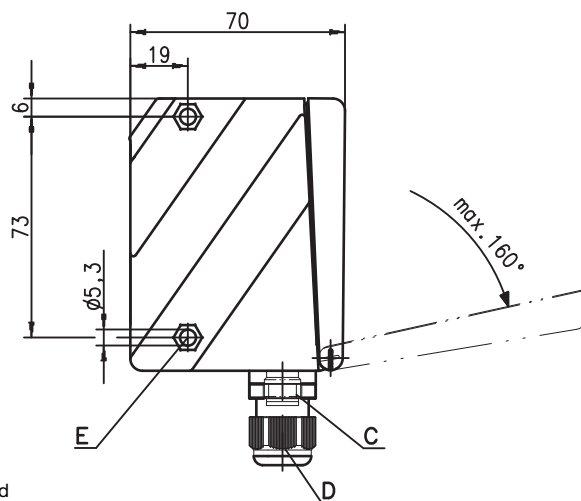
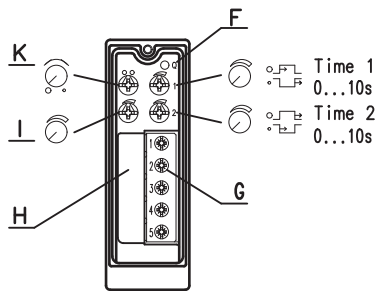
Pallet detection




Pallet repositioning













Dimensioned drawing

- A Green indicator diode
- B Yellow indicator diode
- C Device plug M12x1
- D Screwed cable gland M16x1.5 for Ø 5 ... 10mm
- E Countersinking for SK nut M5, 4.2 deep
- F Output with switching delay option
- G Connection terminals
- H Cable entry
- I Scanning range adjustment
- K Light/dark switching






 Further details can be found in the respective data sheet.

We reserve the right to make changes • BR96_DC_Overview_EN.fm




											
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96 SERIES / DC

Photoel. sensors/
light scanners,
cubic housing

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 150 m	178
 Retro-reflective sensors	0 28 m	182
 Diffuse reflection scanners	0.01 25 m	188

Other 96 Series products:

 AC-DC versions	LS 96, (P)RK 96, (H)RT 96	202
 Optical distance sensors	ODS 96, ODSL 96	286
 Protective sensors	SLS 96	602



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Common technical data

Electrical data	Operating voltage U_B	10 ¹⁾ ... 30VDC
	Residual ripple	≤ 15% of U_B
	Open-circ. curr. (heating)	≤ 50mA (≤ 130mA)
	Signal voltage high/low	≥ ($U_B - 2V$) / ≤ 2V
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Metal or plastic
	Optics cover	Glass or plastic
	Weight (metal/plastic)	380g/150g
Environmental data	Ambient temperature (operation)	-40°C ... +55°C Laser: -40°C ... +50°C
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 69K ²⁾
	Standards applied	IEC 60947-5-2, UL 508
	Certifications	in preparation for the North American market for ...96B models

1) Laser sensors have different values
2) IP 69K only with metal housing

Mounting systems for this series can be found from page 640 onwards

Features

- Metal or plastic housing
- Large, dirt-resistant optical surface
- IP 67 and IP 69K
- Active ambient light suppression A²LS
- Universally usable due to long operating ranges and high performance reserve
- Connection via terminals or M12 connectors
- Laser class 1

1) Not for 96B models



Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A²LS Page 697

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

THROUGHBEAM SENSORS / DC

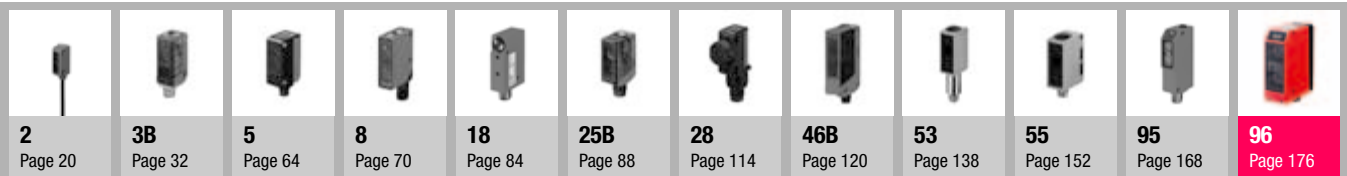
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input checked="" type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors in metal housing						
▶ = Transmitter ◀ = Receiver						
▶ LSS 96 M - 120W - 43 50031574 ◀ LSE 96 M/P - 181W - 41 50031575	<input type="text" value="0 30"/> <input type="text" value="0 39"/>	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 M - 1206 - 43 50032129 ◀ LSE 96 M/P - 1816 - 41 50032128	<input type="text" value="0 30"/> <input type="text" value="0 39"/>	<input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 M - 1200 - 23 50025217 ◀ LSE 96 M/P - 1170 - 22 50025195	<input type="text" value="0 30"/> <input type="text" value="0 39"/>	<input type="checkbox"/>	500Hz	Red light	PNP/DC	Light
▶ LSS 96 M - 1070 - 43 50025228 ◀ LSE 96 M/P - 3010 - 41 50034128	<input type="text" value="0 120"/> <input type="text" value="0 150"/>	<input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 M - 1090 - 43 50103290 ◀ LSE 96 M/P - 3012 - 41 50103291	<input type="text" value="0 120"/> <input type="text" value="0 150"/>	<input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 M - 1070 - 23 50025225 ◀ LSE 96 M/P - 3010 - 21 50082296	<input type="text" value="0 120"/> <input type="text" value="0 150"/>	<input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 M - 1090 - 24 50025223 ◀ LSE 96 M/P - 3012 - 21 50033328	<input type="text" value="0 120"/> <input type="text" value="0 150"/>	<input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 M - 1070 - 43 50025228 ◀ LSE 96 M/P - 1040 - 42 50025205	<input type="text" value="0 50"/> <input type="text" value="0 65"/>	<input type="checkbox"/>	500Hz	Infrared light	PNP/DC	Light
▶ LSS 96 M - 1090 - 24 50025223 ◀ LSE 96 M/P - 1130 - 22 50025201	<input type="text" value="0 50"/> <input type="text" value="0 65"/>	<input type="checkbox"/>	500Hz	Infrared light	PNP/DC	Light
▶ LSS 96 M - 1070 - 23 50025225 ◀ LSE 96 M/N - 1010 - 27 50031295	<input type="text" value="0 50"/> <input type="text" value="0 65"/>	<input type="checkbox"/>	500Hz	Infrared light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

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96 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	2, 7	a, b, c, d, e, f	
M12 connector	5, 7	a, b, c, d, e, f	
Terminals	1, 4, 6, 7		
M12 connector	1, 7	a, b, c, d, e, f	
M12 connector	1, 3, 5, 7	a, b, c, d, e, f	
Terminals	1, 7		
Terminals	1, 3, 5, 7		
M12 connector	1, 4, 6, 7	a, b, c, d, e, f	
Terminals	1, 3, 4, 5, 6, 7		
Terminals	1, 7		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

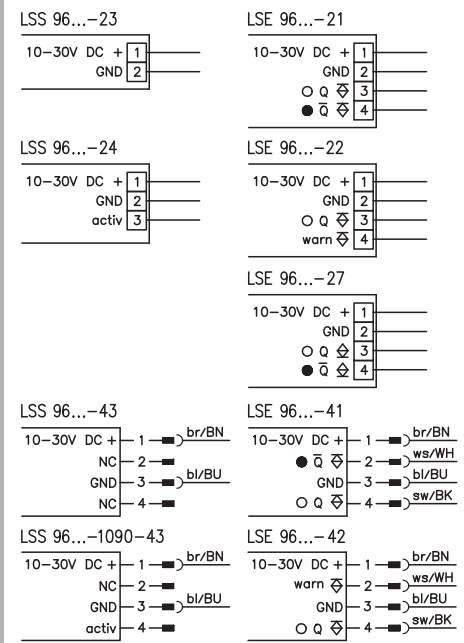
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Wide angle version for easy alignment
- 3 Transmitter with activation input
- 4 Receiver with warning output
- 5 Low-temperature version with optics heating
- 6 Switching delay
- 7 UL approval

Protective
Sensors

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THROUGHBEAM SENSORS / DC

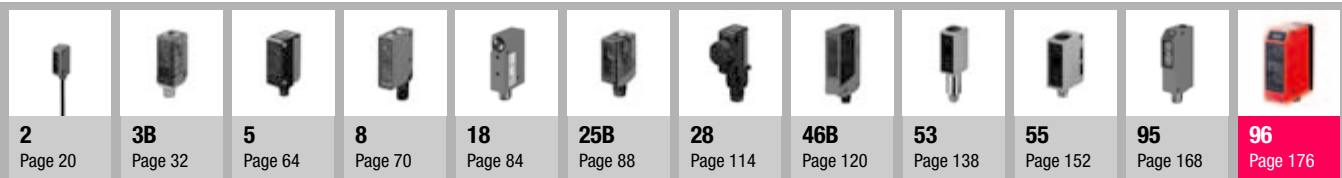
Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors in metal housing			▶ = Transmitter ◀ = Receiver			
▶ LSS 96 M - 1093 - 24 50106871 ◀ LSE 96 M/P 3012 - 21 50033328	0 120 0 150	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 M - 1206 - 43 50032129 ◀ LSE 96 M/P - 1170 - 42 50025197	0 30 0 39	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
Throughbeam sensors in plastic housing			▶ = Transmitter ◀ = Receiver			
▶ LSS 96 K - 1213 - 24 50080657 ◀ LSE 96 K/P - 1140 - 21 50030269	0 30 0 39	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 K - 1070 - 43 50025254 ◀ LSE 96 K/P - 1015 - 45 50103004	0 50 0 65	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Infrared light	PNP/DC	Dark
▶ LSS 96 K - 1070 - 43 50025254 ◀ LSE 96 K/P - 1010 - 41 50025258	0 50 0 65	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 K - 1070 - 43 50025254 ◀ LSE 96 K/P - 1030 - 41 50080483	0 50 0 65	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 K - 1070 - 23 50025255 ◀ LSE 96 K/P - 1030 - 21 50025259	0 50 0 65	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 96 K - 1079 - 43 50108812 ◀ LSE 96 K/P - 1039.1 - 41 50108813	0 30 0 35	<input type="checkbox"/> <input type="checkbox"/>	500Hz	Infrared light	1xPNP/DC	Light/dark reversible

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

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96 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
Terminals	1, 5, 7, 8, 3		
M12 connector	1, 4, 5, 6, 8	a, b, c, d, e, f	
Terminals	1, 3, 8		
M12 connector	1, 2, 8	a, b, c, d, e, f	
M12 connector	1, 8	a, b, c, d, e, f	
M12 connector	1, 6, 8	a, b, c, d, e, f	
Terminals	1, 6, 8		
M12 connector	1, 2, 6, 8	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

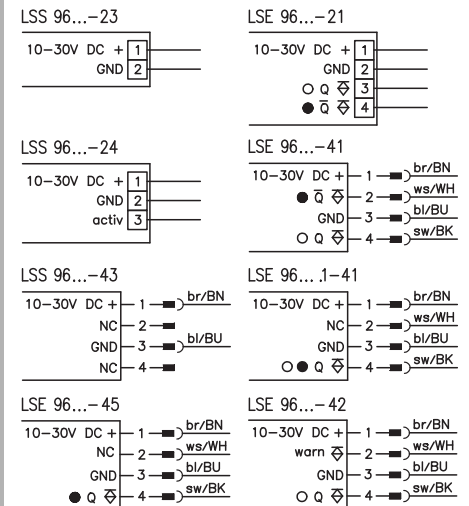
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Transmitter with activation input
- 4 Warning output
- 5 Low-temperature version with optics heating
- 6 Switching delay
- 7 Transmitter activated when activation input = low
- 8 UL approval

RETRO-REFLECTIVE SENSORS / DC

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in metal housing						
RK 96 M/P - 1440 - 21 50030648	0.3 15 0.1 18		1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
Retro-reflective sensors in metal housing with polarization filter						
PRK 96 M/P - 3380 - 41 50061452	0.3 15 0.1 18		1000Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 96 M/P - 3360 - 21 50082065	0.3 15 0.1 18		1000Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 96 M/N - 3366 - 27 50102379	0.3 15 0.1 18		1000Hz	Red light	2xNPN/DC	Light/dark antivalent
PRK 96 M/P - 1361.1 - 47 50104279	0.3 8 0.1 10		1000Hz	Red light	PNP/DC	Light/dark reversible
PRK 96 M/P - 1362 - 47 50080477	0.3 8 0.1 10		1000Hz	Red light	PNP/DC	Light
PRK 96 M/P - 1361 - 47 50082092	0.3 8 0.1 10		1000Hz	Red light	PNP/DC	Light
PRK 96 M/P - 1370 - 42 50025186	0.3 8 0.1 10		1000Hz	Red light	PNP/DC	Light
PRK 96 M/P - 1375 - 22 50109208	0.3 8 0.1 10		1000Hz	Red light	PNP/DC	Dark

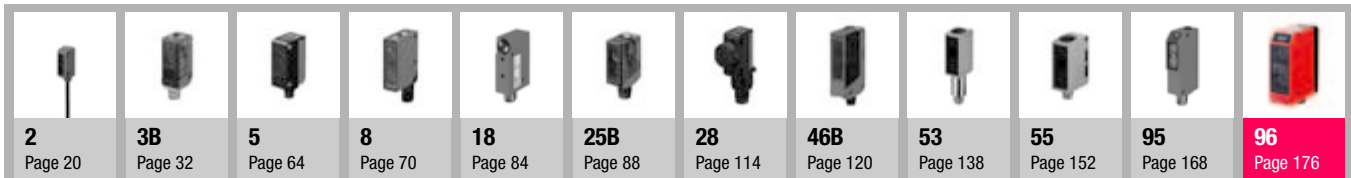
1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 682

We reserve the right to make changes • BR96_DC_PRK1_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



96 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
Terminals	1, 6		
M12 connector	1, 5, 6	a, b, c, d	
Terminals	1, 6		
Terminals	1, 4, 6		
M12 connector	1, 2, 6	a, b, c, d	
M12 connector	1, 2, 4, 6	a, b, c, d	
M12 connector	1, 2, 6	a, b, c, d	
M12 connector	1, 3, 6	a, b, c, d	
Terminals	1, 3, 6		



Photoel. sensors/
light scanners,
cylindrical
housing

Measuring
Sensors

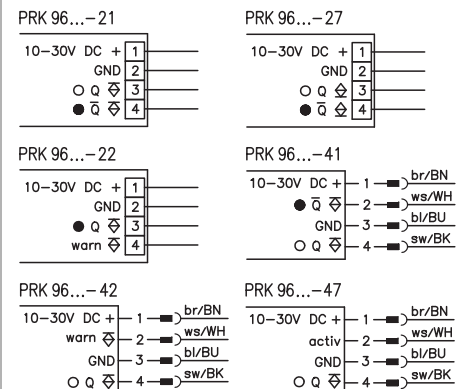
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Activation input
- 3 Warning output
- 4 Low-temperature version with optics heating
- 5 Switching delay
- 6 UL approval

RETRO-REFLECTIVE SENSORS / DC

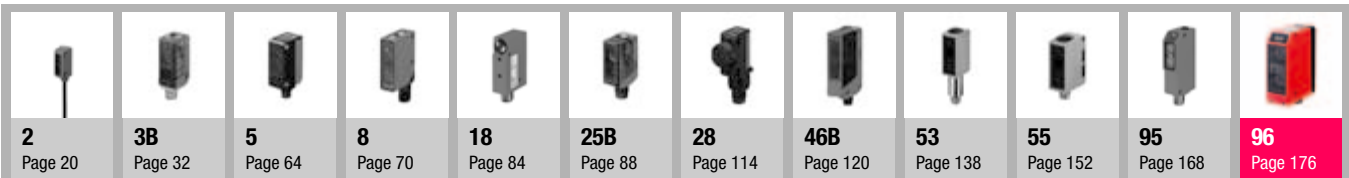
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in metal housing with polarization filter						
PRK 96 M/P - 1400 - 42 50031549	<input type="text" value="0.3"/> 8 <input type="text" value="0.1"/> 10	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light
PRK 96 M/P - 1370 - 22 50025182	<input type="text" value="0.3"/> 8 <input type="text" value="0.1"/> 10	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light
PRK 96 M/P - 1400 - 22 50025178	<input type="text" value="0.3"/> 8 <input type="text" value="0.1"/> 10	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light
PRK 96 M/P - 1832 - 41 50105622	<input type="text" value="0"/> 7 <input type="text" value="0"/> 8.5	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light/dark reversible
PRK 96 M/P - 1838 - 41 50080760	<input type="text" value="0"/> 7 <input type="text" value="0"/> 8.5	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light/dark reversible
PRK 96 M/P - 1838 - 21 50029880	<input type="text" value="0"/> 7 <input type="text" value="0"/> 8.5	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light/dark reversible
PRK 96 M/P - 2838 - 28 50082060	<input type="text" value="0"/> 7 <input type="text" value="0"/> 8.5	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 96 M/P - 1830 - 41 50080469	<input type="checkbox"/> 0 ... 1.5 <input type="checkbox"/> 0 ... 1.85	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light/dark reversible
PRK 96 M/P - 1830 - 21 50028975	<input type="checkbox"/> 0 ... 1.5 <input type="checkbox"/> 0 ... 1.85	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light/dark reversible

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 682

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR96_DC_PPK2_EN.fm



96 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	2, 3, 4, 5, 9	a, b, c, d, e, f	
Terminals	2, 3, 9		
Terminals	2, 3, 4, 5, 9		
M12 connector	3, 9	a, b, c, d, e, f	
M12 connector	1, 6, 7, 9	a, b, c, d, e, f	
Terminals	1, 6, 7, 9		
Terminals	2, 6, 9		
M12 connector	1, 6, 7, 8, 9	a, b, c, d, e, f	
Terminals	1, 6, 7, 8, 9		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

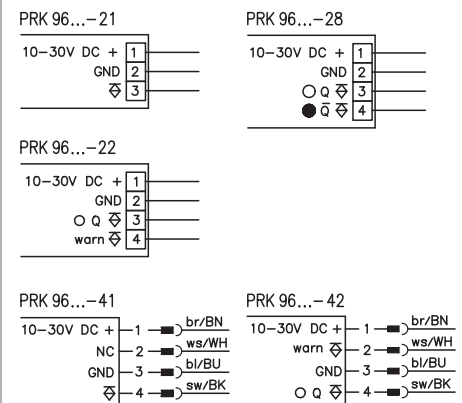
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- Intelligent sensitivity adjustment via 10-turn-potentiometer
- Sensitivity adjustment via potentiometer
- Warning output
- Low-temperature version with optics heating
- Switching delay
- Autocollimation principle
- Transparent media
- Integrated slit diaphragm for detection of the smallest gaps
- UL approval

Protective
Sensors

www.leuze.com/en/96series/

RETRO-REFLECTIVE SENSORS / DC

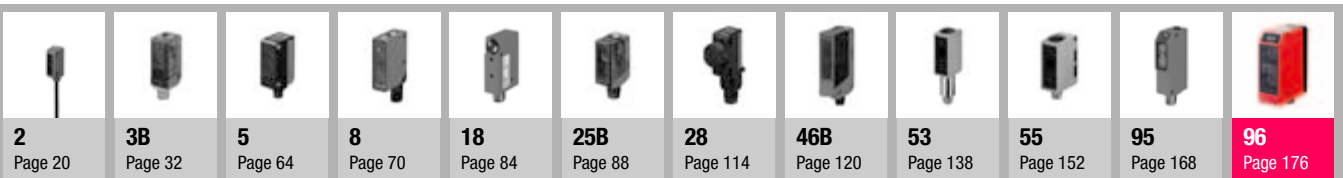
Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Retro-reflective sensors in plastic housing with polarization filter										
PRK 96 K/P - 3368 - 41 50041042	<table border="1"><tr><td>0.3</td><td>26</td></tr><tr><td>0.1</td><td>28</td></tr></table>	0.3	26	0.1	28	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
0.3	26									
0.1	28									
PRK 96 K/P - 1361 - 29 50080476	<table border="1"><tr><td>0.3</td><td>8</td></tr><tr><td>0.1</td><td>10</td></tr></table>	0.3	8	0.1	10	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light
0.3	8									
0.1	10									
PRK 96 K/P - 1360.1 - 41 50103216	<table border="1"><tr><td>0.3</td><td>8</td></tr><tr><td>0.1</td><td>10</td></tr></table>	0.3	8	0.1	10	<input type="checkbox"/>	1000Hz	Red light	PNP/DC	Light/dark reversible
0.3	8									
0.1	10									
PRK 96 K/P - 1360 - 41 50025165	<table border="1"><tr><td>0.3</td><td>8</td></tr><tr><td>0.1</td><td>10</td></tr></table>	0.3	8	0.1	10	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
0.3	8									
0.1	10									
PRK 96 K/P - 1380 - 41 50025166	<table border="1"><tr><td>0.3</td><td>8</td></tr><tr><td>0.1</td><td>10</td></tr></table>	0.3	8	0.1	10	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
0.3	8									
0.1	10									
PRK 96 K/P - 1360 - 21 50025163	<table border="1"><tr><td>0.3</td><td>8</td></tr><tr><td>0.1</td><td>10</td></tr></table>	0.3	8	0.1	10	<input type="checkbox"/>	1000Hz	Red light	2xPNP/DC	Light/dark antivalent
0.3	8									
0.1	10									
PRK 96 K/N - 1380 - 46 50081325	<table border="1"><tr><td>0.3</td><td>8</td></tr><tr><td>0.1</td><td>10</td></tr></table>	0.3	8	0.1	10	<input type="checkbox"/>	1000Hz	Red light	2xNPN/DC	Light/dark antivalent
0.3	8									
0.1	10									

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 682

We reserve the right to make changes • BR96_DC_PRK3_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



96 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	1, 5	a, b, c, d, e, f	
Terminals	1, 2, 5		
M12 connector	1, 4, 5	a, b, c, d, e, f	
M12 connector	1, 5	a, b, c, d, e, f	
M12 connector	1, 3, 5	a, b, c, d, e, f	
Terminals	1, 5		
M12 connector	1, 3, 5	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

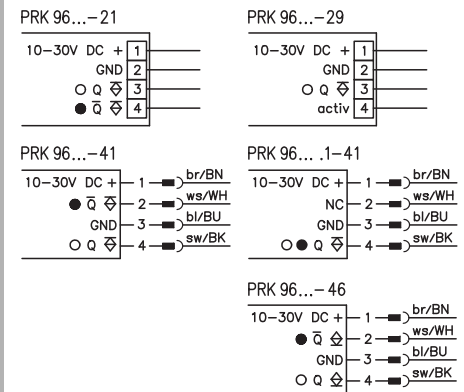
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

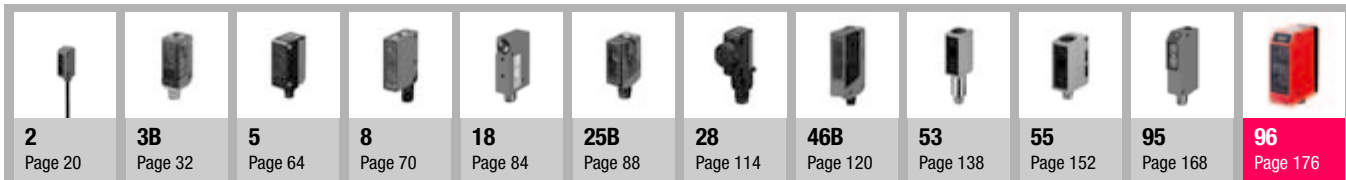
- 1 Sensitivity adjustment via potentiometer
- 2 Activation input (active high)
- 3 Switching delay
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval

DIFFUSE REFLECTION SCANNERS / DC

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners in metal housing						
RT 96 M/P - 1474 - 800 - 42 50041597			1000Hz	Infrared light	PNP/DC	Light
Energetic diffuse reflection scanners in plastic housing						
RT 96 K/P - 1444 - 800 - 41 50081178			1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 96 K/P - 1444 - 800 - 21 50081177			1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 96 K/N - 1444 - 800 - 46 50041595			1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

We reserve the right to make changes • BR96_DC_RT_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
M12 connector	1, 2, 3, 4, 5	a, b, c, d, e, f	
M12 connector	1, 3, 5	a, b, c, d, e, f	
Terminals	1, 3, 5		
M12 connector	1, 3, 5	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

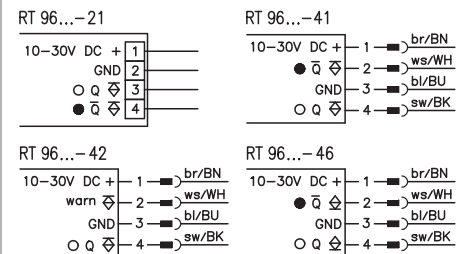
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via potentiometer
- 2 Warning output
- 3 Short range 20mm
- 4 Switching delay
- 5 UL approval

DIFFUSE REFLECTION SCANNERS / DC

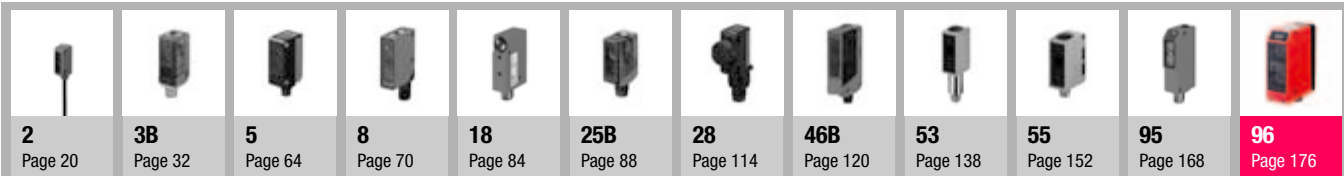
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners in metal housing with background suppression						
HRT 96 M/P - 1630 - 800 - 41 50080047		<input type="checkbox"/>	300Hz	Red light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 1636 - 800 - 41 50032127		<input type="checkbox"/>	300Hz	Red light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 1640 - 800 - 41 50025126		<input type="checkbox"/>	300Hz	Red light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 1640 - 800 - 21 50025124		<input type="checkbox"/>	300Hz	Red light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 3604 - 2000 - 42 50060858		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light, configurable
HRT 96 M/P - 1600 - 2000 - 42 50060857		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 1620 - 1800 - 41 50113909		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent

We reserve the right to make changes • BR96_DC_HRT1_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 5	a, b, c, d, e, f	
M12 connector	1, 3, 5	a, b, c, d, e, f	
M12 connector	1, 4, 5	a, b, c, d, e, f	
Terminals	1, 4, 5		
M12 connector	1, 2, 4, 5	a, b, c, d, e, f	
M12 connector	1, 4, 5	a, b, c, d, e, f	
M12 connector	1, 3, 5	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

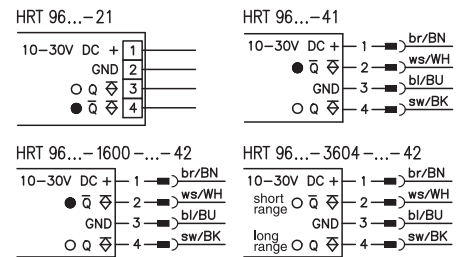
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 2 switching points for short/distant range, programmable switching outputs
- 3 Low-temperature version with optics heating
- 4 Switching delay
- 5 UL approval

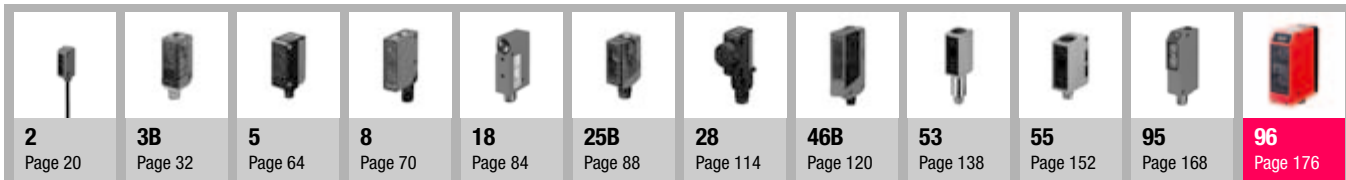
www.leuze.com/en/96series/

DIFFUSE REFLECTION SCANNERS / DC

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners in metal housing with background suppression						
HRT 96 M/P - 1610 - 1200 - 41 50025118		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 1620 - 1200 - 41 50061102		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 1610 - 1200 - 21 50025116		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 96 M/P - 1620 - 1200 - 21 50025114		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 96 M/N - 1606 - 1200 - 27 50040358		<input type="checkbox"/>	300Hz	Infrared light	2xNPN/DC	Light/dark antivalent

We reserve the right to make changes • BR96_DC_HRT2_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



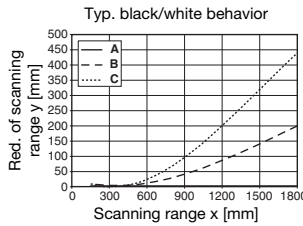
96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 3, 4	a, b, c, d, e, f	
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	
Terminals	1, 3, 4		
Terminals	1, 2, 3, 4		
Terminals	1, 2, 4		



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

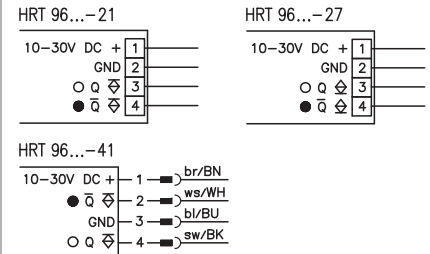
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Low-temperature version with optics heating
- 3 Switching delay
- 4 UL approval

DIFFUSE REFLECTION SCANNERS / DC

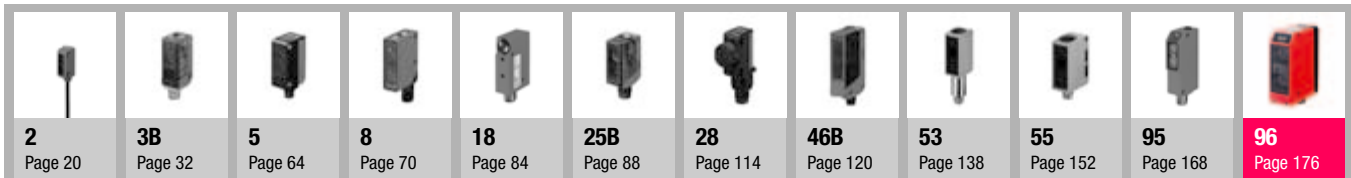
Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Diffuse reflection laser scanners in metal housing with background suppression										
HRTL 96B M/6.9S - S12 50110990	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	1xPush-pull/DC	Light
100	6000									
50	6500									
HRTL 96B M/6.4.02S - S12 50111815	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	1xPush-pull/DC	Light
100	6000									
50	6500									
HRTL 96B M/6.49.02S - S12 50112803	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	1xPush-pull/DC	Light
100	6000									
50	6500									
HRTL 96B M/66.01S - S12 50108889	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	2xPush-pull/DC	Light
100	6000									
50	6500									
HRTL 96B M/66.02S - S12 50113800	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	2xPush-pull/DC	Dark
100	6000									
50	6500									
HRTL 96B M/666.01S - S12 50112804	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	3xPush-pull/DC	Light
100	6000									
50	6500									
HRTL 96B M/V66.01S - S12 50110952	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	Analog/V 2xpush-pull/DC	Light
100	6000									
50	6500									
HRTL 96B M/C66.01S - S12 50111208	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	Analog/mA ¹⁾ 2xpush-pull/DC	Light
100	6000									
50	6500									
HRTL 96B M/C66.03S - S12 50114306	<table border="1"><tr><td>100</td><td>6000</td></tr><tr><td>50</td><td>6500</td></tr></table>	100	6000	50	6500	<input type="checkbox"/> <input type="checkbox"/>	100Hz	Red light laser class 2	Analog/mA ²⁾ 2xpush-pull/DC	Light
100	6000									
50	6500									

1) Analog output 4 ... 20mA corresponding to 150 ... 12000mm / reference: white 90%
2) Analog output 4 ... 20mA corresponding to 150 ... 2000mm / reference: white 90%

Accessories / connection cables More accessories can be found from page 634 onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC
g 50111527	REF 7 - A - 100 x 100	HG foil 100x100mm ² for realizing large scanning ranges

We reserve the right to make changes • BR96_DC_HRT4_EN.fm



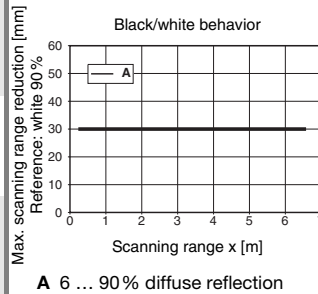
96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
M12 connector	1, 4, 5, 6, 7, 10	a, b, c, d, e, f	
M12 connector	1, 4, 6, 7, 8, 10	a, b, c, d, e, f	
M12 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d, e, f	
M12 connector	1, 2, 4, 6, 7, 10	a, b, c, d, e, f	
M12 connector	1, 2, 4, 6, 7, 10	a, b, c, d, e, f	
M12 connector	1, 2, 4, 7, 10	a, b, c, d, e, f	
M12 connector	1, 3, 4, 6, 7, 10	a, b, c, d, e, f	
M12 connector	1, 3, 4, 6, 7, 10	a, b, c, d, e, f	
M12 connector	1, 3, 4, 6, 7, 10	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

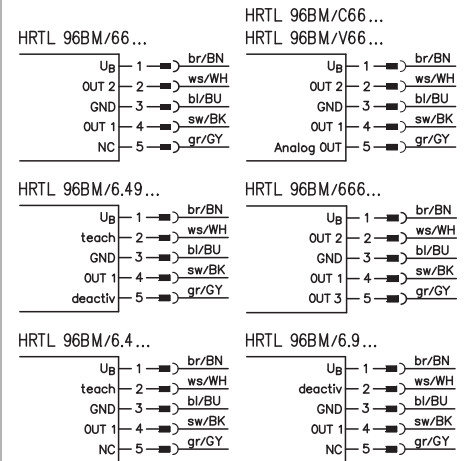
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners Page 690
- Sensors w. laser transmitter Page 695
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Switching point adjustment via teach buttons
- 2 Independently adjustable switching points
- 3 2 independently adjustable switching points + analog output
- 4 Adjustable switching behavior: light/dark
- 5 Deactivation input
- 6 Switching state indicator diodes for each switching output
- 7 Preset reserve + hysteresis for optimum, reliable switching behavior
- 8 Input for external teach with window function
- 9 External mode changeover via deactivation input
- 10 Certification for the North American market in preparation

Protective
Sensors

DIFFUSE REFLECTION SCANNERS / DC

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	Switching frequency	Light source	Output	Switching
Diffuse reflection laser scanners in metal housing with background suppression					
HRTL 96B M/66.9.03S - S12 50112862	150 25000 ^{1) 2)}	100Hz	Red light laser class 2	2xPush-pull/DC	Light
HRTL 96B M/66.04S - S12 50115690	150 25000 ¹⁾	100Hz	Red light laser class 2	2xPush-pull/DC	Dark
HRTL 96B M/C66.01.C1S - S12 50116678	100 6000 50 6500	50Hz	Red light laser class 1	Analog/mA ³⁾ 2xpush-pull/DC	Light
HRTL 96B M/66.01S - S12 50115016	100 6000 50 6500	100Hz	Infrared light laser class 1	2xPush-pull/DC	Light
HRTL 96B M/C66.01S - S12 50115015	100 6000 50 6500	100Hz	Infrared light laser class 1	Analog/mA ⁴⁾ 2xpush-pull/DC	Light
HRTL 96B M/66.03S - S12 50117920	100 6000 50 6500	100Hz	Infrared light laser class 1	2xPush-pull/DC	Dark

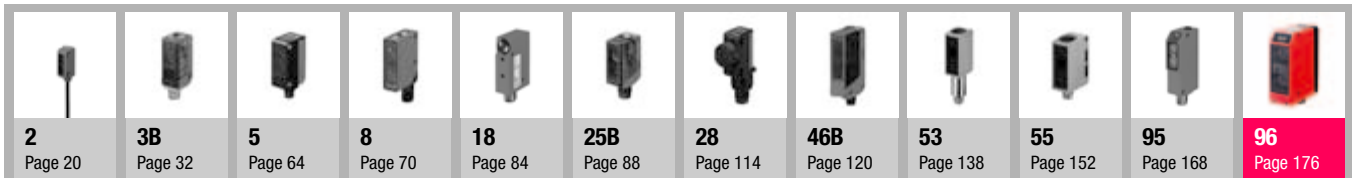
- 1) Teach range against HG foil (high gain) REF 7-A-100x100 (5011527), larger scanning ranges on request
 2) Teach range against standard objects (6% ... 90% diffuse reflection) up to 6000mm
 3) Analog output 4 ... 20mA corresponding to 150 ... 3000mm / reference: white 90%
 4) Analog output 4 ... 20mA corresponding to 150 ... 15000mm / reference: white 90%

We reserve the right to make changes • BR96_DC_HRT7_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC
g 50111527	REF 7 - A - 100 x 100	HG foil 100x100mm ² for realizing large scanning ranges
h 50038060	Refl. tape No. 4 50x1000 mm	Reflective tape, suitable for collision protection, additional dimensions on request



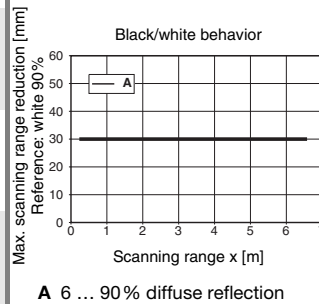
96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
M12 connector	2, 3, 6, 7, 8, 9	a, b, c, d, e, f, g, h	
M12 connector	1, 2, 4, 5, 6, 7, 9	a, b, c, d, e, f, g, h	
M12 connector	1, 3, 4, 5, 6, 9	a, b, c, d, e, f	
M12 connector	1, 2, 4, 5, 6, 8, 9	a, b, c, d, e, f	
M12 connector	1, 3, 4, 5, 6, 8, 9	a, b, c, d, e, f	
M12 connector	1, 2, 4, 5, 6, 8, 9	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

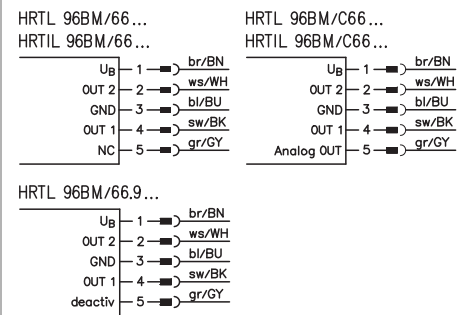
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners Page 690
- Sensors w. laser transmitter Page 695
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Switching point adjustment via teach buttons
- 2 2 independently adjustable switching points
- 3 2 independently adjustable switching points + analog output
- 4 Adjustable switching behavior: light/dark
- 5 Switching state indicator diodes for each switching output
- 6 Preset reserve + hysteresis for optimum, reliable switching behavior
- 7 For telfer line application, detects reflective tape or high-gloss foil
- 8 Red light laser for exact alignment activation/deactivation via teach button
- 9 Certification for the North American market in preparation

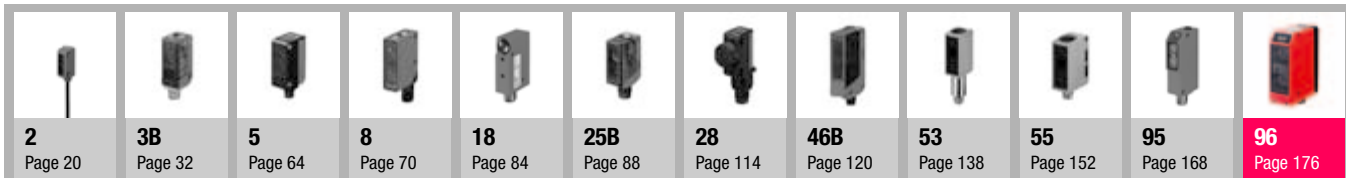
www.leuze.com/en/96series/

DIFFUSE REFLECTION SCANNERS / DC

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners in plastic housing with background suppression						
HRT 96 K/P - 1631 - 800 - 47 50038471		<input type="checkbox"/>	300Hz	Red light	PNP/DC	Light
HRT 96 K/P - 1630 - 800 - 41 50080242		<input type="checkbox"/>	300Hz	Red light	2xPNP/DC	Light/dark antivalent
HRT 96 K/P - 1640 - 800 - 41 50081464		<input type="checkbox"/>	300Hz	Red light	2xPNP/DC	Light/dark antivalent
HRT 96 K/P - 1630 - 800 - 21 50080327		<input type="checkbox"/>	300Hz	Red light	2xPNP/DC	Light/dark antivalent
HRT 96 K/P - 1600 - 1800 - 41 50105667		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent

We reserve the right to make changes • BR96_DC_HRT5_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
M12 connector	1, 4	a, b, c, d, e, f	
M12 connector	1, 3, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Terminals	1, 4		
M12 connector	1, 4	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

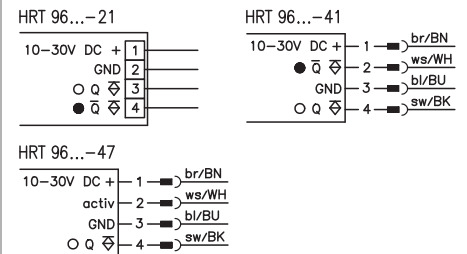
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

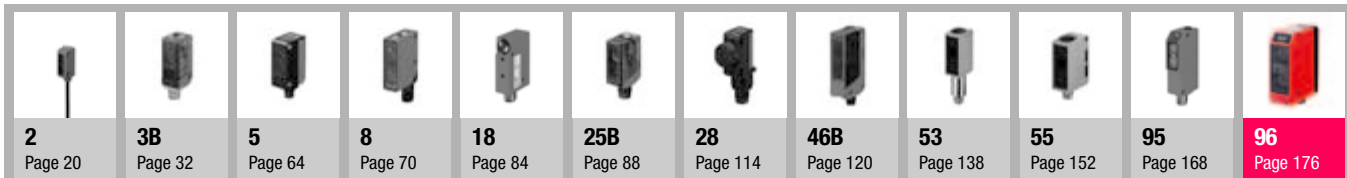
- 1 Scanning range adjustment via multiturn potentiometer
- 2 Activation input
- 3 Switching delay
- 4 UL approval

DIFFUSE REFLECTION SCANNERS / DC

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners in plastic housing with background suppression						
HRT 96 K/P - 1607 - 1200 - 49 50103090		<input type="checkbox"/>	300Hz	Infrared light	PNP/DC	Light
HRT 96 K/P - 1600.1 - 1200 - 41 50103217		<input type="checkbox"/>	300Hz	Infrared light	PNP/DC	Light/dark reversible
HRT 96 K/P - 1600 - 1200 - 41 50025133		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent
HRT 96 K/P - 1600 - 1200 - 21 50025135		<input type="checkbox"/>	300Hz	Infrared light	2xPNP/DC	Light/dark antivalent

We reserve the right to make changes • BR96_DC_HRT6_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 3	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
M12 connector	1, 2, 3	a, b, c, d, e, f	
M12 connector	1, 3	a, b, c, d, e, f	
Terminals	1, 3		



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

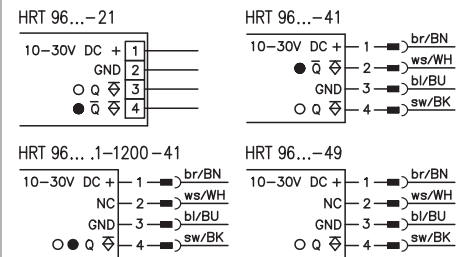
Ultrasonic
Sensors

Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

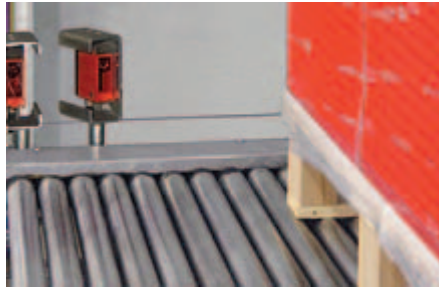
Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 UL approval

OVERVIEW



Compartment occupancy monitoring



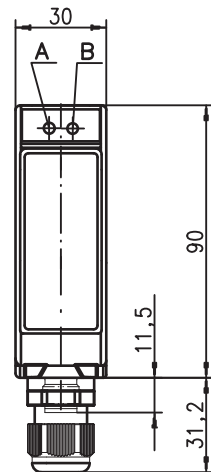
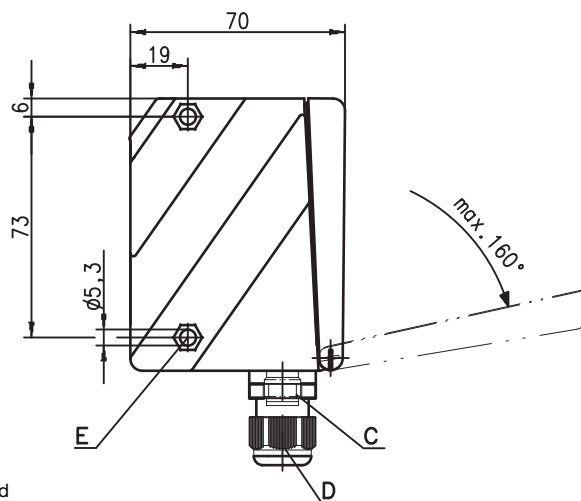
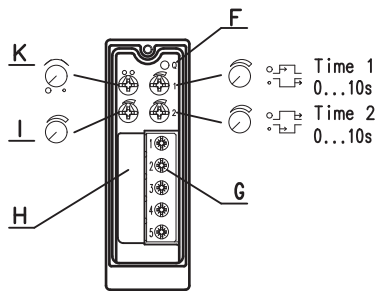
Pallet detection




Pallet repositioning













Dimensioned drawing

- A Green indicator diode
- B Yellow indicator diode
- C Device plug M12x1
- D Screwed cable gland M16x1.5 for Ø 5 ... 10mm
- E Countersinking for SK nut M5, 4.2 deep
- F Output with switching delay option
- G Connection terminals
- H Cable entry
- I Scanning range adjustment
- K Light/dark switching






 Further details can be found in the respective data sheet.

We reserve the right to make changes • BR96_UC_Overview_EN.fm


											
2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

96 SERIES / AC-DC

Photoel. sensors/
light scanners,
cubic housing

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 150 m	204
 Retro-reflective sensors	0 24 m	206
 Diffuse reflection scanners	□ 20 ... 1800 mm	210

Other 96 Series products:

 DC versions	LS 96, (P)RK 96, (H)RT 96	176
 Optical distance sensors	ODS 96, ODSL 96	286
 Protective sensors	SLS 96	602



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Common technical data

Electrical data	Operating voltage U_B	20 ... 230VAC, 50/60Hz 20 ... 230VDC
	Power consumption	≤ 2VA
	Switching voltage	250VAC/DC
	Switching current	3A (at 250VAC/30VDC)
	Switching power	750VA, $\cos\phi=1$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	Flashing yellow LED	No performance reserve
Mechanical data	Housing	Metal or plastic
	Optics cover	Glass or plastic
	Weight (metal/plastic)	380g/150g
Environmental data	Ambient temperature (operation)	-30°C ... +55°C
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 69K ¹⁾
	Standards applied	IEC 60947-5-2, UL 508

1) IP 69K with metal housing

Mounting systems for this series can be found from page 640 onwards

Features

- Metal or plastic housing
- Large, dirt-resistant optical surface
- IP 67 and IP 69K
- Active ambient light suppression A²LS
- AC-DC version (20 ... 230VAC-DC) with relay output
- Universally usable due to long operating ranges and high performance reserve

1) Not for 96 K/R models



Optical Sensor

- | | |
|-------------------------------|----------|
| ● Throughbeam sensors | Page 689 |
| ● Retro-reflective sensors | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A ² LS | Page 697 |

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

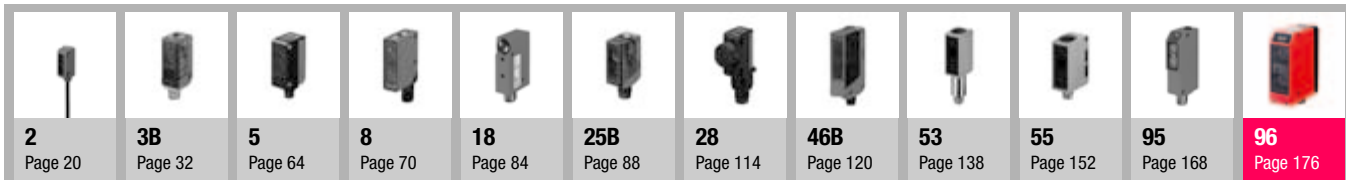
Light
Curtains

Protective
Sensors

THROUGHBEAM SENSORS / AC-DC

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors in metal housing			▶ = Transmitter ◀ = Receiver			
▶ LSS 96 M - 175W - 26 ◀ LSE 96 M/R - 176W - 25	50032004 50032003	<input type="checkbox"/> 0 30 <input checked="" type="checkbox"/> 0 39	20Hz	Red light	Relay	NC/NO
▶ LSS 96 M - 1350 - 26 ◀ LSE 96 M/R - 3310 - 25	50080081 50031651	<input type="checkbox"/> 0 120 <input checked="" type="checkbox"/> 0 150	20Hz	Infrared light	Relay	NC/NO
▶ LSS 96 M - 1350 - 26 ◀ LSE 96 M/R - 1310 - 25	50080081 50080080	<input type="checkbox"/> 0 50 <input checked="" type="checkbox"/> 0 65	20Hz	Infrared light	Relay	NC/NO
Throughbeam sensors in plastic housing			▶ = Transmitter ◀ = Receiver			
▶ LSS 96 K - 1350 - 26 ◀ LSE 96 K/R - 1310 - 25	50025253 50025257	<input type="checkbox"/> 0 50 <input checked="" type="checkbox"/> 0 65	20Hz	Infrared light	Relay	NC/NO
▶ LSS 96 K - 1350 - 26 ◀ LSE 96 K/R - 1320 - 25	50025253 50025256	<input type="checkbox"/> 0 50 <input checked="" type="checkbox"/> 0 65	20Hz	Infrared light	Relay	NC/NO

We reserve the right to make changes • BR96_UC_LS_EN.fm



96 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
Terminals	1, 2, 4		
Terminals	1, 4		
Terminals	1, 4		
Terminals	1		
Terminals	1, 3		



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

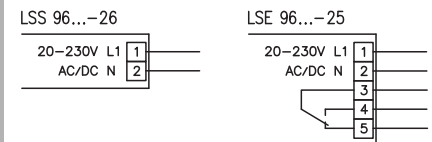
Ultrasonic
Sensors

Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Wide angle version for easy alignment
- 3 Switching delay
- 4 UL approval

Protective
Sensors













www.leuze.com/en/96series/

RETRO-REFLECTIVE SENSORS / AC-DC

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in plastic housing						
RK 96 K/R - 1560 - 25 50080484	<input type="checkbox"/> 0.3 ... 15 <input checked="" type="checkbox"/> 0.1 ... 18	<input type="checkbox"/>	20Hz	Infrared light	Relay	NC/NO
Retro-reflective sensors in metal housing with polarization filter						
PRK 96 M/R - 3420 - 25 50082066	<input type="checkbox"/> 0.3 ... 15 <input checked="" type="checkbox"/> 0.1 ... 18	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO
PRK 96 M/R - 3430 - 25 50061111	<input type="checkbox"/> 0.3 ... 15 <input checked="" type="checkbox"/> 0.1 ... 18	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO
PRK 96 M/R - 1858 - 25 50029881	<input type="checkbox"/> 0 ... 7 <input checked="" type="checkbox"/> 0 ... 8.5	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO
PRK 96 M/R - 1850 - 25 50080470	<input type="checkbox"/> 0 ... 1.5 <input checked="" type="checkbox"/> 0 ... 1.85	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 683

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2 Page 20	3B Page 32	5 Page 64	8 Page 70	18 Page 84	25B Page 88	28 Page 114	46B Page 120	53 Page 138	55 Page 152	95 Page 168	96 Page 176

96 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
Terminals	2, 7		
Terminals	2, 8		
Terminals	2, 5, 8		
Terminals	1, 3, 4, 5, 8		
Terminals	1, 3, 4, 5, 6, 8		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

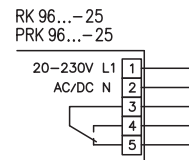
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

- 1 Intelligent sensitivity adjustment via 10-turn-potentiometer
- 2 Sensitivity adjustment via potentiometer
- 3 Autocollimation principle
- 4 Transparent media
- 5 Switching delay
- 6 Integrated slit diaphragm 3.7x20mm
- 7 Light/dark switching reversible
- 8 UL approval

Protective
Sensors

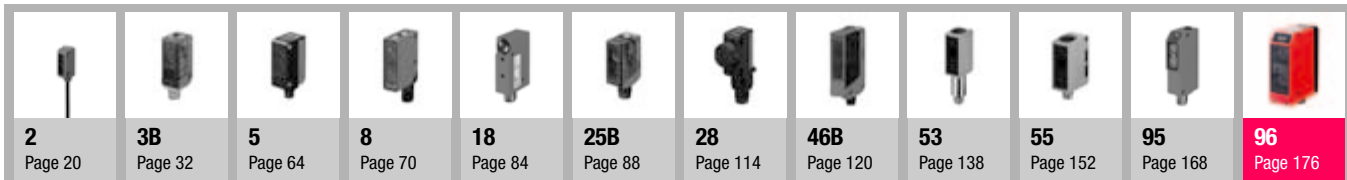
www.leuze.com/en/96series/

RETRO-REFLECTIVE SENSORS / AC-DC

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in plastic housing with polarization filter						
PRK 96 K/R - 3428 - 25 50035351	0.3 20 0.1 24	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO
PRK 96 K/R - 3428.1 - 25 50107216	0.3 20 0.1 24	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO
PRK 96 K/R - 1420 - 25 50025167	0.3 8 0.1 10	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO
PRK 96 K/R - 1420.1 - 25 50105587	0.3 8 0.1 10	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO
PRK 96 K/R - 1430 - 25 50025168	0.3 8 0.1 10	<input type="checkbox"/>	20Hz	Red light	Relay	NC/NO

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 683

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96 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
Terminals	1		
Terminals	1, 3		
Terminals	1		
Terminals	1, 3		
Terminals	1, 2		



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

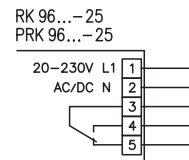
Ultrasonic
Sensors

Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Options

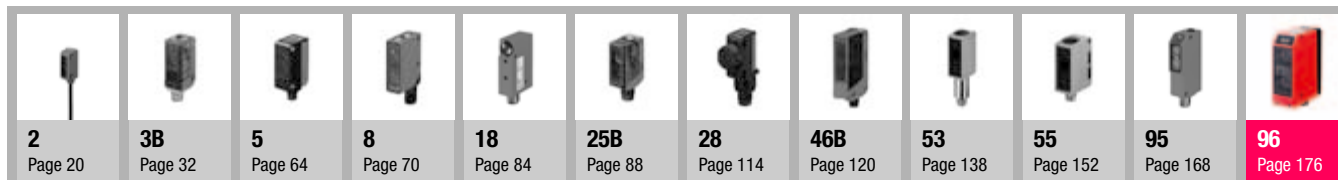
- 1 Sensitivity adjustment via potentiometer
- 2 Switching delay
- 3 Light/dark switching reversible

Protective
Sensors

www.leuze.com/en/96series/

DIFFUSE REFLECTION SCANNERS / AC-DC

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners in metal housing						
RT 96 M/R - 1574 - 800 - 25 50041598	<input type="text" value="20"/> <input type="text" value="800"/> <input type="text" value="20"/> <input type="text" value="1200"/>	<input type="checkbox"/> <input type="checkbox"/>	20Hz	Infrared light	Relay	NC/NO
Diffuse reflection scanners in metal housing with background suppression						
HRT 96 M/R - 1680 - 1200 - 25 50080076	<input type="text" value="100"/> <input type="text" value="1200"/> <input type="text" value="100"/> <input type="text" value="1800"/>	<input type="checkbox"/> <input type="checkbox"/>	20Hz	Infrared light	Relay	NC/NO
HRT 96 M/R - 1690 - 1200 - 25 50080075	<input type="text" value="100"/> <input type="text" value="1200"/> <input type="text" value="100"/> <input type="text" value="1800"/>	<input type="checkbox"/> <input type="checkbox"/>	20Hz	Infrared light	Relay	NC/NO
Diffuse reflection scanners in plastic housing with background suppression						
HRT 96 K/R - 1680 - 1200 - 25 50025132	<input type="text" value="100"/> <input type="text" value="1200"/> <input type="text" value="100"/> <input type="text" value="1800"/>	<input type="checkbox"/> <input type="checkbox"/>	20Hz	Infrared light	Relay	NC/NO
HRT 96 K/R - 1690 - 1200 - 25 50025131	<input type="text" value="100"/> <input type="text" value="1200"/> <input type="text" value="100"/> <input type="text" value="1800"/>	<input type="checkbox"/> <input type="checkbox"/>	20Hz	Infrared light	Relay	NC/NO



96 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. b/w behavior
Terminals	1, 2, 3, 4		
Terminals	1, 4		<p>A white 90% B gray 18% C black 6%</p>
Terminals	1, 3, 4		<p>Typ. black/white behavior</p>
Terminals	1		<p>A white 90% B gray 18% C black 6%</p>
Terminals	1, 3		<p>Typ. black/white behavior</p>



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

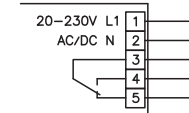
Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive
Switches

Electrical connection

RT 96...-25
HRT 96...-25



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains




Protective
Sensors

Options

- 1 Scanning range adjustment via potentiometer
- 2 Short range (20mm)
- 3 Switching delay
- 4 UL approval

www.leuze.com/en/96series/

SERIES SELECTION TABLE, CYLINDRICAL

Series	Dimensions in mm (WxHxD)	Housing material		Operating principle	Typ. op. range limit	Light source		
		Plastic	Metal			Infrared light	Red light	Laser
 412	M12 x 55		●	Throughbeam sensor	0 ... 8m		●	
				Retro-reflective sensor	0.05 ... 1.6m		●	
				Diffuse reflection scanners	0 ... 400mm		●	
 318	M18 x 50	●	●	Throughbeam sensor	0 ... 120m	●		●
				Retro-reflective sensor	0.02 ... 15m	●	●	●
				Diffuse reflection scanners	0 ... 700mm	●		●
				Diff. refl. scanner with backgr. suppr.	1 ... 140mm		●	
 618	M18 x 60		●	Throughbeam sensor	0 ... 12m	●		
				Retro-reflective sensor	0 ... 7m		●	
				Diffuse reflection scanners	0 ... 300mm	●		

SWITCHING OPTICAL SENSORS

Max. switching frequency	Response time	Special object features			Resistance in industrial environment			Protection class	Page
		Shiny surface (metallic, foil coated object)	Transparent medium (glass, PET, foil)	Small part	High insensitivity towards soiling / performance reserve	Temperatures < -35 °C			
500Hz	1 ms						IP 67	246	
700Hz	0.7 ms						IP 67		
700Hz	0.7 ms						IP 67		
5000Hz	0.1 ms			●		●	IP 67	220	
5000Hz	0.1 ms			●		●	IP 67		
5000Hz	0.1 ms			●			IP 67		
1000Hz	0.5 ms						IP 67		
500Hz	1 ms						IP 67	254	
500Hz	1 ms						IP 67		
500Hz	1 ms						IP 67		

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors




Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

	Series	Dimensions in mm (Ø x L)	Housing material		Typ. op. range limit [m]					
			Plastic	Metal	10	25	50	100	150	
	412	M12 x 55		●	0	8				
	318	M18 x 50	●	●	0	120				
	618	M18 x 60		●	0	12				

THROUGHBEAM SENSORS, CYLINDRICAL

	Light source			Switching output/ Operating voltage						Connection						Page
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector	
		●		●							●		●			246
	●	●	●	●	●						●		●			220
	●			●							●					254

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors


Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

	Series	Dimensions in mm (Ø x L)	Housing material		Typ. op. range limit [m]						
			Plastic	Metal	2	5	16	21	30		
	412	M12 x 55		●	0.1.6						
	318	M18 x 50	●	●	0.02	15					
	618	M18 x 60		●	0	7					

RETRO-REFLECTIVE SENSORS, CYLINDRICAL



	Light source			Switching output/ Operating voltage						Connection						Page
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector	Cable + M12 connector	
		●		●							●		●			246
	●	●	●	●	●						●		●			220
		●		●							●					254

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors




Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

	Series	Dimensions in mm (Ø x L)	Housing material		Typ. scan range limit [mm]			
			Plastic	Metal	500	1000	2500	6500
	412	M12 x 55		●	0	400		
	318	M18 x 50	●	●	0	700		
	618	M18 x 60		●	0	300		

DIFFUSE REFLECTION SCANNERS, CYLINDRICAL



	Light source			Switching output/ Operating voltage						Connection					Page	
	Infrared light	Red light	Laser	PNP/DC	NPN/DC	Push-pull/DC	Relay/AC	Relay/DC	Relay/AC-DC	M8 connector	M12 connector	Terminals	Cable	Cable + M8 connector		Cable + M12 connector
		●		●							●		●			246
	●	●	●	●	●	●					●		●			220
	●			●							●					254

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

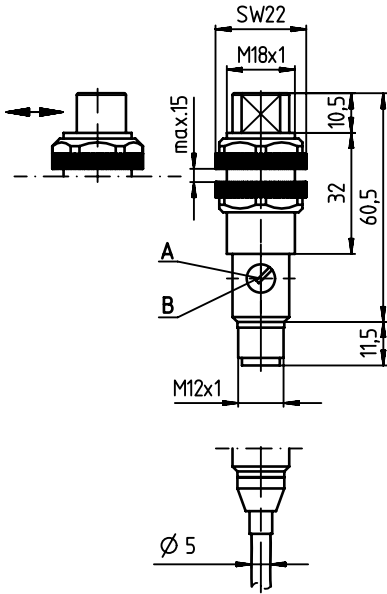
OVERVIEW



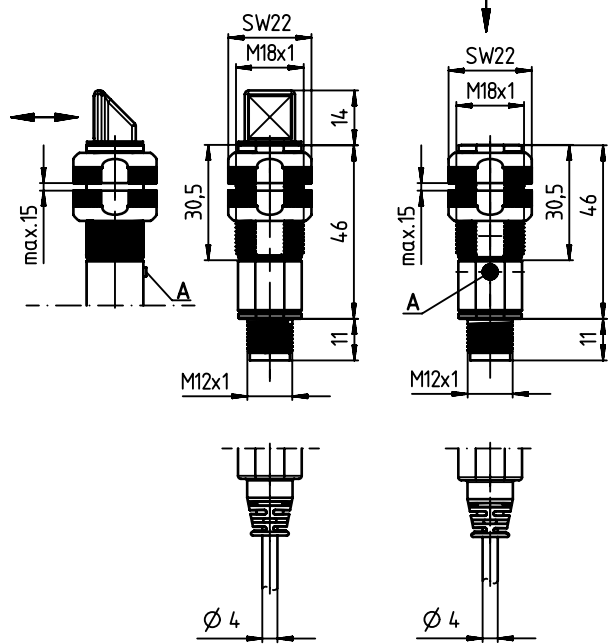
Mould-removal monitoring


Dimensioned drawing

318 Series

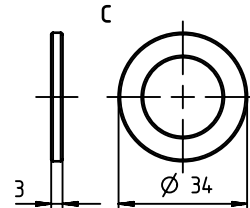


318B Series



 Further details can be found in the respective data sheet.




- A** Indicator diode
- B** Sensitivity adjustment
- C** Spacer disc




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318(B) Page 220	412 Page 246	618 Page 254

318(B) SERIES

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 <input type="text" value="120"/> m	224
 Retro-reflective sensors	0.02 <input type="text" value="15"/> m	228
 Diffuse reflection scanners	<input type="text" value="0"/> ... 700 mm	234

Other 318 Series products:

 Protective sensors	SLS 318	604
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Common technical data

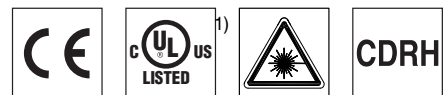
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 10(15) \%$ of U_B
	Open-circuit current	$\leq 25\text{mA}$
	Signal voltage high/low	...318: $\geq (U_B - 1.6\text{V}) / \leq 1.6\text{V}$...318B: $\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready to operate
	Yellow or red LED	Switching output
	Flashing yellow or red LED	No performance reserve
Mechanical data	Housing	Plastic or stainless steel
	Optics cover	Plastic
	Weight (connector/cable)	20g/90g
Environmental data	Ambient temperature (operation)	-25 °C ... +65 °C Laser: -25 °C ... +60 °C ...318B: -40 °C ... +60 °C
	VDE safety class	II, all-insulated / III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2
	Certifications	in preparation for the North American market for ...318B types

Mounting systems for this series can be found from page 630 onwards

Features

- Very small construction for limited spaces
- Available in plastic and stainless steel housing
- Available with straight and angular optics
- Powerful laser devices available in M18 cylindrical housing

1) Not for 318B models



Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors in plastic housing						
▶ = Transmitter ◀ = Receiver						
▶ LS 318B / 9D - M12 ◀ LE 318B / 4P - M12	50116853 50116847	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 318B / 9D ◀ LE 318B / 4P	50116852 50116846	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 318B / 9D - M12 ◀ LE 318B / 2N - M12	50116853 50116845	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2xNPN/DC	Light/dark antivalent
▶ LS 318B / 9D ◀ LE 318B / 2N	50116852 50116844	<input type="checkbox"/> 0 10 <input checked="" type="checkbox"/> 0 15	500Hz	Red light	2xNPN/DC	Light/dark antivalent
▶ LS 318B.W / 9D - M12 ◀ LE 318B.W / 4P - M12	50116855 50116851	<input type="checkbox"/> 0 5.5 <input checked="" type="checkbox"/> 0 8	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 318B.W / 9D ◀ LE 318B.W / 4P	50116854 50116850	<input type="checkbox"/> 0 5.5 <input checked="" type="checkbox"/> 0 8	500Hz	Red light	2xPNP/DC	Light/dark antivalent
▶ LS 318B.W / 9D - M12 ◀ LE 318B.W / 2N - M12	50116855 50116849	<input type="checkbox"/> 0 5.5 <input checked="" type="checkbox"/> 0 8	500Hz	Red light	2xNPN/DC	Light/dark antivalent
▶ LS 318B.W / 9D ◀ LE 318B.W / 2N	50116854 50116848	<input type="checkbox"/> 0 5.5 <input checked="" type="checkbox"/> 0 8	500Hz	Red light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

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318B SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

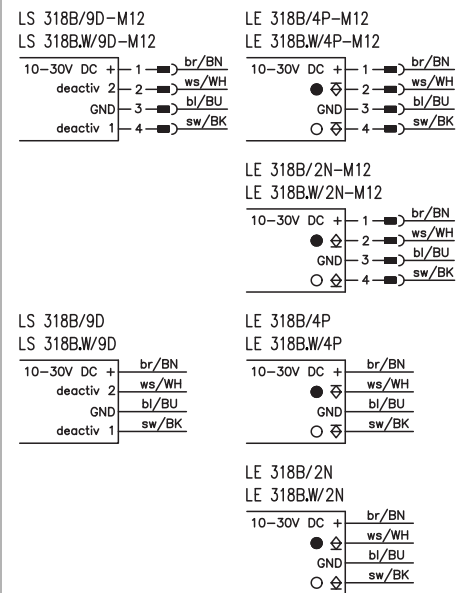
Connection	Option	Accessories	Typ. light spot
M12 connector	1, 3, 4	a, b, c, d, e, f	
Cable, 2 m	1, 3, 4		
M12 connector	1, 3, 4	a, b, c, d, e, f	
Cable, 2 m	1, 3, 4		
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	
Cable, 2 m	1, 2, 3, 4		
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	
Cable, 2 m	1, 2, 3, 4		



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Transmitter with two deactivation inputs (complementary)
- 2 90° optics
- 3 Integrated *omni-mount* fine adjustment
- 4 Certification in preparation for the North American market

www.leuze.com/en/318series/

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors in metal housing			▶ = Transmitter ◀ = Receiver			
▶ LSS 318 M - S12 ◀ LSE 318 M/P - S12	50081339 50081340	<input type="text" value="0"/> <input type="text" value="15"/> <input type="text" value="0"/> <input type="text" value="20"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 318 M ◀ LSE 318 M/P	50081341 50081342	<input type="text" value="0"/> <input type="text" value="15"/> <input type="text" value="0"/> <input type="text" value="20"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 318 M ◀ LSE 318 M/N	50081341 50108613	<input type="text" value="0"/> <input type="text" value="15"/> <input type="text" value="0"/> <input type="text" value="20"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
▶ LSS 318 WM - S12 ◀ LSE 318 WM/P - S12	50082154 50082158	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="13"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 318 WM ◀ LSE 318 WM/P	50082152 50082156	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="13"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
▶ LSS 318 WM ◀ LSE 318 WM/N	50082152 50083246	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="13"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

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318 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

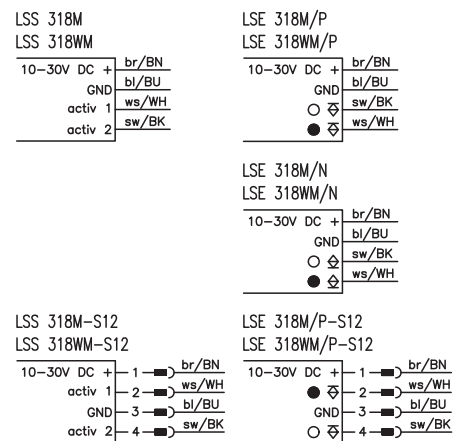
Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2, 4	a, b, c, d, e, f	
Cable, 2 m	1, 2, 4		
Cable, 2 m	1, 2, 4		
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	
Cable, 2 m	1, 2, 3, 4		
Cable, 2 m	1, 2, 3, 4		



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transmitter with 2 activation inputs
- 3 90° optics
- 4 UL approval (class 2 acc. to NEC)

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam laser sensors in metal housing			▶ = Transmitter ◀ = Receiver			
▶ LSSL 318 M - S12 50083172 ◀ LSEL 318 M/P - S12 50083176	0 100 0 120	<input type="checkbox"/> <input type="checkbox"/>	5000Hz	Red light laser class 1	2xPNP/DC	Light/dark antivalent
▶ LSSL 318 M 50083171 ◀ LSEL 318 M/P 50083175	0 100 0 120	<input type="checkbox"/> <input type="checkbox"/>	5000Hz	Red light laser class 1	2xPNP/DC	Light/dark antivalent
▶ LSSL 318 M - S12 50083172 ◀ LSEL 318 M/P - B5 - S12 50083180	0 15 0 18	<input type="checkbox"/> <input type="checkbox"/>	5000Hz	Red light laser class 1	2xPNP/DC	Light/dark antivalent
▶ LSSL 318 M 50083171 ◀ LSEL 318 M/P - B5 50083179	0 15 0 18	<input type="checkbox"/> <input type="checkbox"/>	5000Hz	Red light laser class 1	2xPNP/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR318_LSL1_EN.fm

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318 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

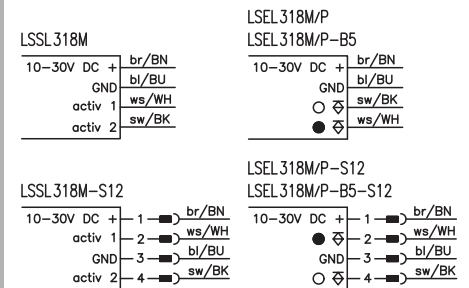
Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2, 4	a, b, c, d, e, f	<p>Typ. light spot</p> <p>Diameter [mm]</p> <p>Distance [m]</p>
Cable, 2m	1, 2, 4		
M12 connector	1, 2, 3, 4	a, b, c, d, e, f	
Cable, 2m	1, 2, 3, 4		



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694
- Sensors w. laser transmitter Page 695

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transmitter with 2 activation inputs
- 3 Integrated pin diaphragm Ø 1.0mm for detection of small parts
- 4 UL approval (class 2 acc. to NEC)

www.leuze.com/en/318series/

RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in metal housing						
RK 318 M/P - S12 50081345	0.03 4.6 0.02 6	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RK 318 M/P 50081346	0.03 4.6 0.02 6	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RK 318 M/N - S12 50082143	0.03 4.6 0.02 6	<input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RK 318 M/N 50083234	0.03 4.6 0.02 6	<input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 684

We reserve the right to make changes • BR318_RK1_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	

		
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318 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

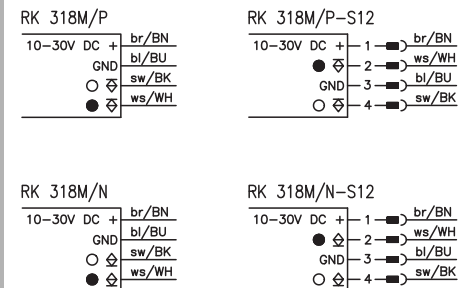
Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2 m	1, 2		
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2 m	1, 2		



Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 UL approval (class 2 acc. to NEC)

RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in plastic housing with polarization filter						
PRK 318B/4P - M12 50116859	0.02 4.5 0.02 6		500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 318B/4P 50116858	0.02 4.5 0.02 6		500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 318B/2N- M12 50116857	0.02 4.5 0.02 6		500Hz	Red light	2xNPN/DC	Light/dark antivalent
PRK 318B/2N 50116856	0.02 4.5 0.02 6		500Hz	Red light	2xNPN/DC	Light/dark antivalent
PRK 318B.W/4P - M12 50116863	0.02 4 0.02 5		500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 318B.W/4P 50116862	0.02 4 0.02 5		500Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 318B.W/2N- M12 50116861	0.02 4 0.02 5		500Hz	Red light	2xNPN/DC	Light/dark antivalent
PRK 318B.W/2N 50116860	0.02 4 0.02 5		500Hz	Red light	2xNPN/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 684

We reserve the right to make changes • BR318B_PRK1_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



318B SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

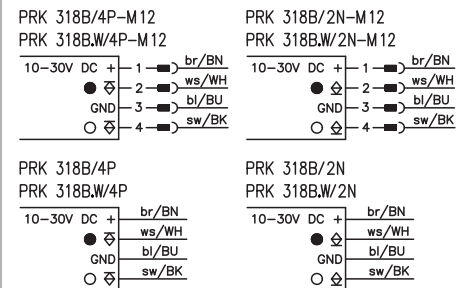
Connection	Option	Accessories	Typ. light spot
M12 connector	2, 3	a, b, c, d, e, f	
Cable, 2 m	2, 3		
M12 connector	2, 3	a, b, c, d, e, f	
Cable, 2 m	2, 3		
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2 m	1, 2, 3		
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2 m	1, 2, 3		



Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Electrical connection



Options

- 1 90° optics
- 2 Integrated *omni-mount* fine adjustment
- 3 Certification in preparation for the North American market

RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in metal housing with polarization filter						
PRK 318 M/P - S12 50081349	0.03 4.6 ¹⁾ 0.02 6 ¹⁾		1000Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 318 M/P 50081350	0.03 4.6 ¹⁾ 0.02 6 ¹⁾		1000Hz	Red light	2xPNP/DC	Light/dark antivalent
PRK 318 M/N - S12 50082145	0.03 4.6 ¹⁾ 0.02 6 ¹⁾		1000Hz	Red light	2xNPN/DC	Light/dark antivalent
PRK 318 M/N 50083140	0.03 4.6 ¹⁾ 0.02 6 ¹⁾		1000Hz	Red light	2xNPN/DC	Light/dark antivalent
Retro-reflective laser sensors in metal housing with polarization filter						
PRKL 318 M/P - S12 50083184	0.12 12 ²⁾ 0.10 15 ²⁾		5000Hz	Red light laser class 1	2xPNP/DC	Light/dark antivalent
PRKL 318 M/P 50083183	0.12 12 ²⁾ 0.10 15 ²⁾		5000Hz	Red light laser class 1	2xPNP/DC	Light/dark antivalent

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 684
 2) The specified values apply in combination with reflectors MTK(S) 50 x 50, additional reflectors with range specifications can be found on page 684

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



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318 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

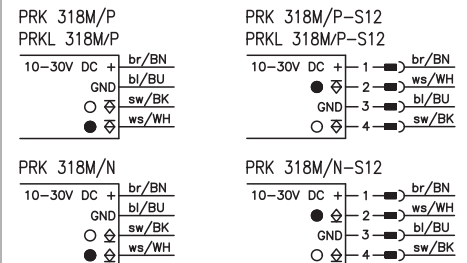
Connection	Option	Accessories	Typ. light spot
M12 connector	1, 3	a, b, c, d, e, f	
Cable, 2 m	1, 3		
M12 connector	1, 3	a, b, c, d, e, f	
Cable, 2 m	1, 3		
M12 connector	1, 3	a, b, c, d, e, f	<p>Typ. light spot</p>
Cable, 2 m	1, 3		



Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695



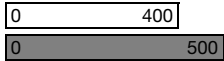

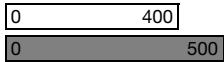
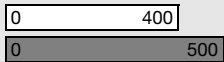
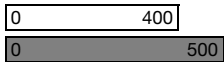
Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners in metal housing						
RT 318 M/P - 550 - S12 50082196		<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/P - 550 50082198		<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/P - 400 - S12 50081353		<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 WM/P - 400 - S12 50082174		<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/P - 400 50081354		<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/N - 400 - S12 50082147		<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 M/N - 400 50083112		<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



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318 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

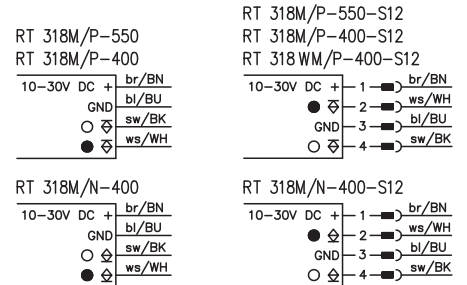
Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 3	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 3		
M12 connector	1, 3	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2m	1, 3		
M12 connector	1, 3	a, b, c, d, e, f	
Cable, 2m	1, 3		



Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Scanning range adjustment via potentiometer
- 2 90° optics
- 3 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners in metal housing						
RT 318 M/P - 200 - S12 50081357	<input type="checkbox"/> 0 200 <input type="checkbox"/> 0 250	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/P - 200 50081358	<input type="checkbox"/> 0 200 <input type="checkbox"/> 0 250	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/N - 200 - S12 50083102	<input type="checkbox"/> 0 200 <input type="checkbox"/> 0 250	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 M/N - 200 50082050	<input type="checkbox"/> 0 200 <input type="checkbox"/> 0 250	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 WM/P - 100 - S12 50082170	<input type="checkbox"/> 0 ... 100 <input type="checkbox"/> 0 ... 130	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/P - 100 - S12.11 50109471	<input type="checkbox"/> 0 ... 100 <input type="checkbox"/> 0 ... 120	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/P - 100.11 50109470	<input type="checkbox"/> 0 ... 100 <input type="checkbox"/> 0 ... 120	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 M/N - 100 - S12.11 50083249	<input type="checkbox"/> 0 ... 100 <input type="checkbox"/> 0 ... 120	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 M/N - 100.11 50108611	<input type="checkbox"/> 0 ... 100 <input type="checkbox"/> 0 ... 120	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR318_RT2_EN.fm

		
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318 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 4		
M12 connector	1, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 4		
M12 connector	1, 3, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
M12 connector	1, 2, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2, 4		
M12 connector	1, 2, 4	a, b, c, d, e, f	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2, 4		



Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

Electrical connection

RT 318M/P-100-S12.11	RT 318M/N-100-S12.11
RT 318WM/P-100-S12	RT 318M/N-200-S12
RT 318M/P-200-S12	
<p>10-30V DC + 1 — br/BN</p> <p>2 — ws/WH</p> <p>GND 3 — bi/BU</p> <p>4 — sw/BK</p>	<p>10-30V DC + 1 — br/BN</p> <p>2 — ws/WH</p> <p>GND 3 — bi/BU</p> <p>4 — sw/BK</p>
RT 318M/P-100.11	RT 318M/N-100.11
RT 318M/P-200	RT 318M/N-200
<p>10-30V DC + br/BN</p> <p>GND bi/BU</p> <p>sw/BK</p> <p>ws/WH</p>	<p>10-30V DC + br/BN</p> <p>GND bi/BU</p> <p>sw/BK</p> <p>ws/WH</p>

Options

- 1 Scanning range adjustment via potentiometer
- 2 V-optics for background suppression (Fading)
- 3 90° optics
- 4 UL approval (class 2 acc. to NEC)

www.leuze.com/en/318series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source Light spot ¹⁾	Output	Switching				
Energetic diffuse reflection laser scanners in metal housing										
RTL 318 M/P - 300 - S12 50083188	<table border="1"> <tr> <td>0</td> <td>300</td> </tr> <tr> <td>0</td> <td>350</td> </tr> </table>	0	300	0	350		5000Hz	Red light laser class 2 Ø 5mm	2xPNP/DC	Light/dark antivalent
0	300									
0	350									

1) At the specified scanning range

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Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

		
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318 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

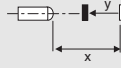
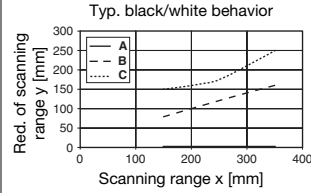
Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

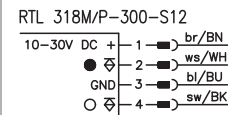
Connection	Option	Accessories	Typ. b/w behavior
M12 connector	1, 2	a, b, c, d, e, f	<p>A white 90% B gray 18% C black 6%</p>  <p>Typ. black/white behavior</p> 



Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Electrical connection



Options

- 1 Scanning range adjustment via potentiometer
- 2 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners in plastic housing						
RT 318 K/P - 550 - S12 50082175	0 550 0 700	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/P - 550 50082197	0 550 0 700	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/N - 550 - S12 50083194	0 550 0 700	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 K/N - 550 50115969	0 550 0 700	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 K/P - 400 - S12 50081351	0 400 0 500	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/P - 400 50081352	0 400 0 500	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 WK/P - 400 - S12 50082173	0 400 0 500	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 WK/P - 400 50082171	0 400 0 500	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/N - 400 - S12 50082146	0 400 0 500	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 K/N - 400 50083113	0 400 0 500	<input type="checkbox"/> <input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR318_RT3_EN.fm



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318 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 3	a, b, c, d, e, f	
Cable, 2m	1, 3		
M12 connector	1, 3	a, b, c, d, e, f	
Cable, 2m	1, 3		
M12 connector	1, 3	a, b, c, d, e, f	
Cable, 2m	1, 3		
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2m	1, 2, 3		
M12 connector	1, 3	a, b, c, d, e, f	
Cable, 2m	1, 3		



Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Electrical connection

<p>RT 318K/P-400 RT 318K/P-550 RT 318WK/P-400</p> <p>10-30V DC + $\begin{matrix} \text{br}/\text{BN} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \\ \text{ws}/\text{WH} \end{matrix}$ GND $\begin{matrix} \text{br}/\text{BN} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \\ \text{ws}/\text{WH} \end{matrix}$</p>	<p>RT 318K/P-400-S12 RT 318K/P-550-S12 RT 318WK/P-400-S12</p> <p>10-30V DC + $\begin{matrix} \text{br}/\text{BN} \\ \text{ws}/\text{WH} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \end{matrix}$ GND $\begin{matrix} \text{br}/\text{BN} \\ \text{ws}/\text{WH} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \end{matrix}$</p>
<p>RT 318K/N-400 RT 318K/N-550</p> <p>10-30V DC + $\begin{matrix} \text{br}/\text{BN} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \\ \text{ws}/\text{WH} \end{matrix}$ GND $\begin{matrix} \text{br}/\text{BN} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \\ \text{ws}/\text{WH} \end{matrix}$</p>	<p>RT 318K/N-400-S12 RT 318K/N-550-S12</p> <p>10-30V DC + $\begin{matrix} \text{br}/\text{BN} \\ \text{ws}/\text{WH} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \end{matrix}$ GND $\begin{matrix} \text{br}/\text{BN} \\ \text{ws}/\text{WH} \\ \text{bi}/\text{BU} \\ \text{sw}/\text{BK} \end{matrix}$</p>

Options

- 1 Scanning range adjustment via potentiometer
- 2 90° optics
- 3 UL approval (class 2 acc. to NEC)

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners in plastic housing						
RT 318 K/P - 200 - S12 50081355	<input type="text" value="0"/> <input type="text" value="200"/> <input type="text" value="0"/> <input type="text" value="250"/>	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/P - 200 50081356	<input type="text" value="0"/> <input type="text" value="200"/> <input type="text" value="0"/> <input type="text" value="250"/>	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/N - 200 - S12 50082148	<input type="text" value="0"/> <input type="text" value="200"/> <input type="text" value="0"/> <input type="text" value="250"/>	<input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 K/N - 200 50083163	<input type="text" value="0"/> <input type="text" value="200"/> <input type="text" value="0"/> <input type="text" value="250"/>	<input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 WK/P - 100 - S12 50082169	<input type="text" value="0"/> ... 100 <input type="text" value="0"/> ... 130	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 WK/P - 100 50082167	<input type="text" value="0"/> ... 100 <input type="text" value="0"/> ... 130	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 WK/N - 100 - S12 50083139	<input type="text" value="0"/> ... 100 <input type="text" value="0"/> ... 130	<input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent
RT 318 K/P - 100 - S12.11 50083244	<input type="text" value="0"/> ... 100 <input type="text" value="0"/> ... 120	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/P - 100.11 50109473	<input type="text" value="0"/> ... 100 <input type="text" value="0"/> ... 120	<input type="checkbox"/>	1000Hz	Infrared light	2xPNP/DC	Light/dark antivalent
RT 318 K/N - 100.11 50108612	<input type="text" value="0"/> ... 100 <input type="text" value="0"/> ... 120	<input type="checkbox"/>	1000Hz	Infrared light	2xNPN/DC	Light/dark antivalent

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

		
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318 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 4	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 2m	1, 4		
M12 connector	1, 4	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 2m	1, 4		
M12 connector	1, 3, 4	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 2m	1, 3, 4		
M12 connector	1, 3, 4	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2, 4		
M12 connector	1, 2, 4	a, b, c, d	<p>Typ. black/white behavior</p>
Cable, 2m	1, 2, 4		

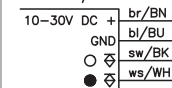


Optical Sensor

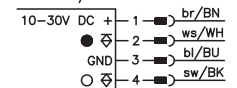
- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

Electrical connection

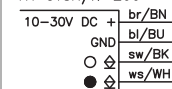
RT 318K/P-100.11
RT 318WK/P-100
RT 318K/P-200



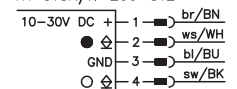
RT 318K/P-100-S12.11
RT 318WK/P-100-S12
RT 318K/P-200-S12



RT 318K/N-100.11
RT 318K/N-200



RT 318WK/N-100-S12
RT 318K/N-200-S12


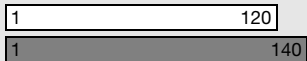
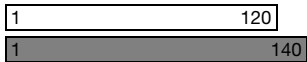



Options

- 1 Scanning range adjustment via potentiometer
- 2 V-optics for background suppression (Fading)
- 3 90° optics
- 4 UL approval (class 2 acc. to NEC)

www.leuze.com/en/318series/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Diffuse reflection scanners in metal housing with background suppression						
HRTR 318 M/66 - 120 - S12 50106086		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 318 M/66 - 120 50106090		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
Diffuse reflection scanners in plastic housing with background suppression						
HRTR 318 K/66 - 120 - S12 50106085		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent
HRTR 318 K/66 - 120 50106089		<input type="checkbox"/>	1000Hz	Red light	2xPush-pull/DC	Light/dark antivalent

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

We reserve the right to make changes • BR318_HRTR_EN.fm

		
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318 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

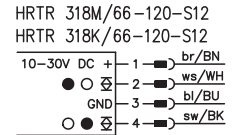
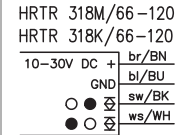
Connection	Option	Accessories	Typ. b/w behavior
			<p>A white 90% B gray 18% C black 6%</p>
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2m	1, 2, 3		
M12 connector	1, 2, 3	a, b, c, d, e, f	
Cable, 2m	1, 2, 3		



Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Electrical connection



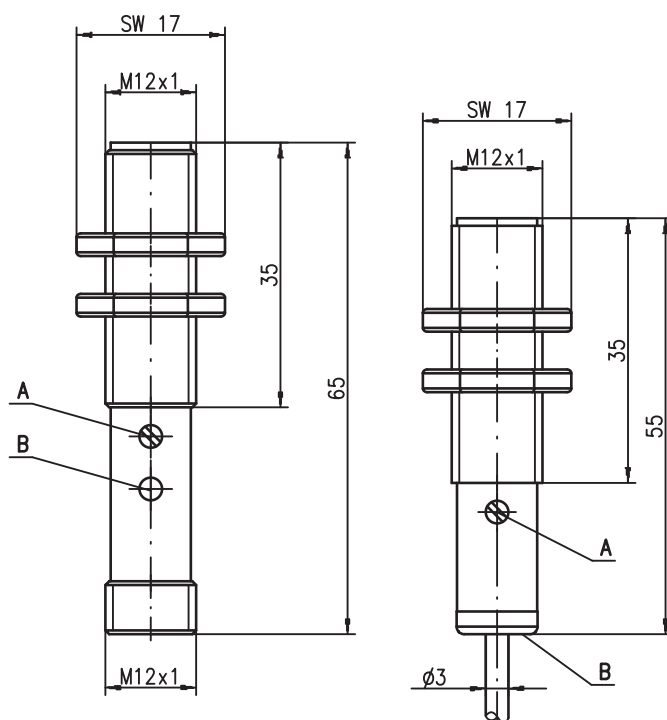
Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 UL approval (class 2 acc. to NEC)

www.leuze.com/en/318series/

OVERVIEW

Dimensioned drawing



Further details can be found in the respective data sheet.

- A** Sensitivity adjustment
- B** Indicator diode

We reserve the right to make changes • BR412_Overview_EN.fm



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412 SERIES


Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 ... 8 m	248
 Retro-reflective sensors	0.05 ... 1.6 m	250
 Diffuse reflection scanners	0 ... 400 mm	252



Common technical data		
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 20\text{mA}$
	Signal voltage high/low	$\geq (U_B - 3\text{V}) / \leq 3\text{V}$
Indicators	Yellow LED	Switching output
Mechanical data	Housing	Nickel-faced brass
	Optics cover	Plastic
	Weight (connector/cable)	18g/46g
Environmental data	Ambient temperature (operation)	$-25^\circ\text{C} \dots +55^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2
	Mounting systems for this series can be found from page 632 onwards	

Features

- Slim and short M12 construction
- Robust metal housing
- Visible red light for easy alignment



Optical Sensor

● Throughbeam sensors	Page 689
● Retro-reflective sensors	Page 689
● Diffuse reflection scanners	Page 690

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

www.leuze.com/en/412series/

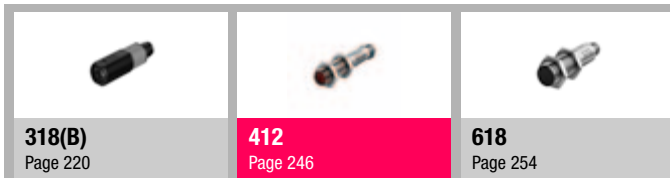
THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Throughbeam sensors						
Set LS 412 M/P - S12 ¹⁾ 50081431	0 6 0 8		500Hz	Red light	PNP/DC	Light/dark reversible
LS 412 M/P ¹⁾ 50081432	0 6 0 8		500Hz	Red light	PNP/DC	Light/dark reversible

1) Set with transmitter and receiver

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	



412 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2 m	1, 2		

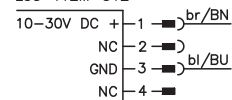


Optical Sensor

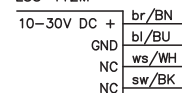
- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection

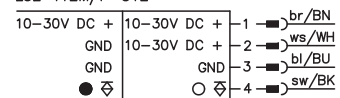
LSS 412M-S12



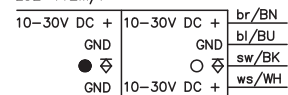
LSS 412M



LSE 412M/P-S12



LSE 412M/P



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable

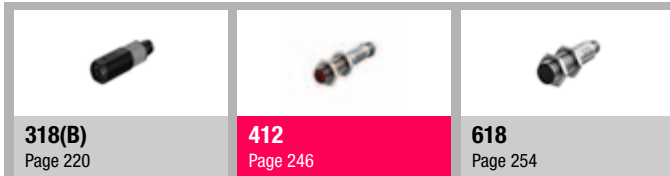
RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] <input type="checkbox"/> Typ. op. range limit ¹⁾ [m] <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Retro-reflective sensors in metal housing with polarization filter					
PRK 412 M/P - S12 50081407	0.15 1.3 0.05 1.6	700Hz	Red light	PNP/DC	Light/dark reversible
PRK 412 M/P 50081408	0.15 1.3 0.05 1.6	700Hz	Red light	PNP/DC	Light/dark reversible

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 685

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Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



412 SERIES
Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

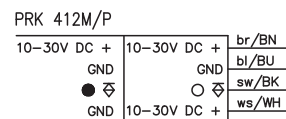
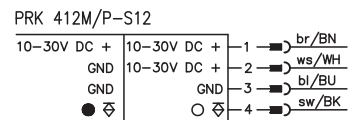
Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2 m	1, 2		



Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

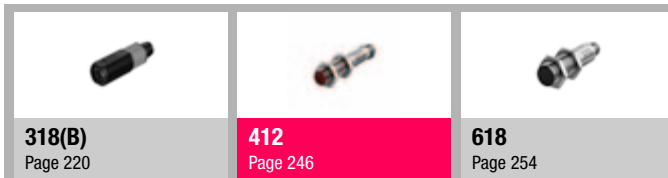
- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners						
RT 412 M/P - 200 - S12 50081409	<input type="text" value="0"/> <input type="text" value="200"/> <input type="text" value="0"/> <input type="text" value="400"/>	<input type="checkbox"/>	700Hz	Red light	PNP/DC	Light/dark reversible
RT 412 M/P - 200 50081410	<input type="text" value="0"/> <input type="text" value="200"/> <input type="text" value="0"/> <input type="text" value="400"/>	<input type="checkbox"/>	700Hz	Red light	PNP/DC	Light/dark reversible

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Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



412 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Option	Accessories	Typ. b/w behavior
M12 connector	1, 2	a, b, c, d, e, f	
Cable, 2m	1, 2		

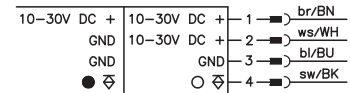


Optical Sensor

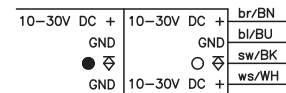
- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

Electrical connection

RT 412M/P-200-S12



RT 412M/P-200

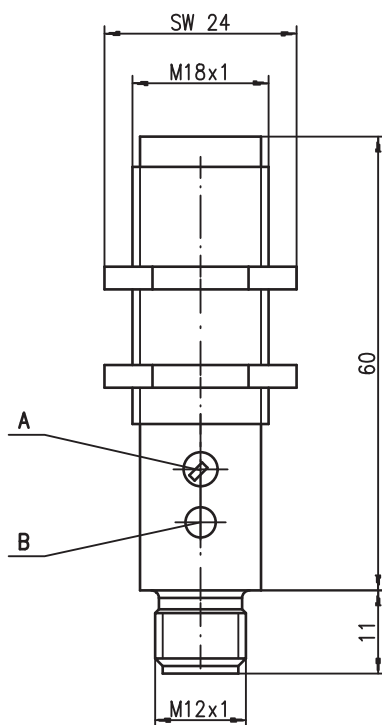


Options

- 1 Scanning range adjustment via potentiometer
- 2 Light/dark switching via control cable

OVERVIEW

Dimensioned drawing



Further details can be found in the respective data sheet.

- A** Sensitivity adjustment
- B** Indicator diode

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Page 220






412
Page 246



618
Page 254

618 SERIES


Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 ... 12 m	256
 Retro-reflective sensors	0 ... 7 m	258
 Diffuse reflection scanners	0 ... 300 mm	260



Common technical data		
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 30\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2.5\text{V}) / \leq 2.5\text{V}$
Indicators	Green dual LED	Ready to operate
	Yellow dual LED	Switching output
	Flashing yellow dual LED	No performance reserve
Mechanical data	Housing	Nickel-faced brass
	Optics cover	Plastic
	Weight	40g
Environmental data	Ambient temperature (operation)	$-25^\circ\text{C} \dots +55^\circ\text{C}$
	Protective circuit	Short circuit and overload protection
	Protection class	IP 67
	Standards applied	IEC 60947-5-2
	Mounting systems for this series can be found from page 630 onwards	

Features

- **Short M18 construction for limited spaces**
- **Robust metal housing**
- **Dual LED display for easy commissioning**



Optical Sensor

● Throughbeam sensors	Page 689
● Retro-reflective sensors	Page 689
● Diffuse reflection scanners	Page 690

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

www.leuze.com/en/618series/

THROUGHBEAM SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Throughbeam sensors										
SET LS 618 / 4 - S12 ¹⁾ 50038451	<table border="1"> <tr> <td>0</td> <td>10</td> </tr> <tr> <td>0</td> <td>12</td> </tr> </table>	0	10	0	12		500Hz	Infrared light	PNP/DC	Light/dark reversible
0	10									
0	12									

1) Set consists of transmitter and receiver

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	

		
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618 SERIES
Throughbeam sensors



Photoel. sensors/
light scanners,
cubic housing

Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2	a, b, c, d, e, f	



Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

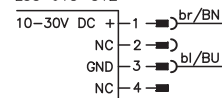
Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

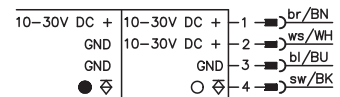
Inductive
Switches

Electrical connection

LSS 618-S12



LSE 618/4-S12



Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Options

- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable

www.leuze.com/en/618series/

RETRO-REFLECTIVE SENSORS

Part description Part No.:	Operating range ¹⁾ [m] Typ. op. range limit ¹⁾ [m]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching				
Retro-reflective sensors with polarization filter										
PRK 618 / 4 - S12 50038450	<table border="1"> <tr> <td>0</td> <td>5</td> </tr> <tr> <td>0</td> <td>7</td> </tr> </table>	0	5	0	7		500Hz	Red light	PNP/DC	Light/dark reversible
0	5									
0	7									

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 685

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC	
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC	
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC	

		
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618 SERIES

Retro-reflective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

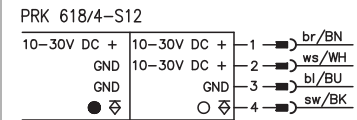
Connection	Option	Accessories	Typ. light spot
M12 connector	1, 2	a, b, c, d, e, f	



Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Scanning range [mm] Typ. scan range limit [mm]	<input type="checkbox"/> <input type="checkbox"/>	Switching frequency	Light source	Output	Switching
Energetic diffuse reflection scanners						
RT 618 / 4 - 200 - S12 50038449	<input type="text" value="0"/> <input type="text" value="200"/> <input type="text" value="0"/> <input type="text" value="300"/>		500Hz	Infrared light	PNP/DC	Light/dark reversible

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Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



618 SERIES

Diffuse reflection scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

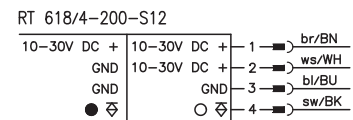
Connection	Option	Accessories	Typ. b/w behavior
M12 connector	1, 2	a, b, c, d, e, f	



Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

Electrical connection



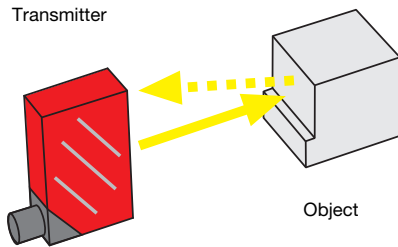
Options

- 1 Scanning range adjustment via potentiometer
- 2 Light/dark switching via control cable

SELECTION GUIDE

Optical distance sensors





Measurement principle



Selection table ODS(L) on page 266

The diffuse light reflected by the object is analyzed using various measurement techniques. The results are used to determine the distance from the object to the sensor.

Products and typ. measurement ranges [mm]

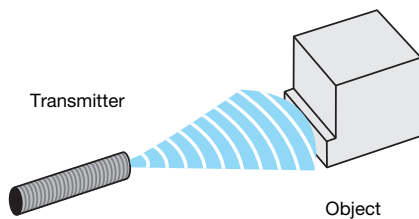
	ODSL 8 20 — 500	from page 268 onwards
	ODSL 9 50 — 650	from page 272 onwards
	ODS(L) 96(B) / ODKL 96B 60 — 25000	from page 286 onwards
	ODSL 30 200 — 30000	from page 282 onwards

Features

- To a large extent, the measurement technique is independent of the color and structure of the object
- Measurement of small object in the entire measurement range
- Up to 1000 measurements per second
- Three different measurement principles:
 1. Triangulation principle for measurement ranges between 20mm and 2300mm
 2. Time of Flight principle for measurement ranges up to 25,000mm
 3. Phase measurement principle for measurement ranges up to 65,000mm



Ultrasonic distance sensors

Measurement principle



Ultrasonic distance sensors measure the propagation time of the ultrasonic waves which are reflected back to the sensor. The distance to the object is then calculated using this propagation time.

Products and typ. measurement ranges [mm]

	HRTU 418 50 — 1000	from page 302 onwards
	VRTU 430 60 — 6000	from page 306 onwards

Features

- Detection of diffuse, transparent and shiny as well as solid, liquid or powdered objects
- Detection of objects with overhanging material
- Can be used at low measurement rates (typically 10 measurements per second)
- Not affected by dust, fog and smoke



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

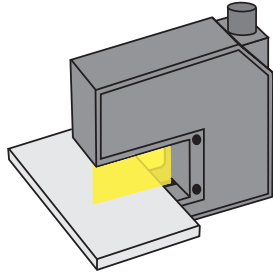
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Measuring forked sensors

Measurement principle



The transmitted light is spread into a parallel light band by means of a lens and received by the opposing CCD line. Interrupting this light band allows, for example, the edge of an object to be determined or the width of an object to be measured.

Products and typ. measurement ranges [mm]



GS 754(B)
0 25

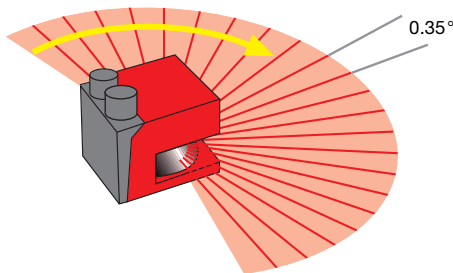
from **page 310** onwards

Features

- Edge and object detection of up to 3 objects in 25mm wide light band
- Minimum object diameter 0.5mm
- Resolution 14µm
- Analogue, digital and switching outputs
- Typical applications
 - Edge detection and height verification
 - Gap measurement with and without projecting edge
 - Position determination of punched holes
 - Detection of broken objects

Optical surface distance sensors

Measurement principle



The surface distance sensor scans its surroundings within a 190° arc by transmitting 529 laser beams per cycle. The distances to the objects located in the scanning range are determined using the pulse propagation time technique.

Products and typ. measurement ranges [mm]



ROD 4 / ROD 4plus

from **page 314** onwards

0 65000

Features

- To a large extent, the measurement technique is independent of the color and structure of the object
- Scanning angle 190°
- Scanning rate 25 scans per second
- Measurement value resolution 5mm
- Typical applications
 - Collision prevention on driver-less transportation systems
 - Fill-level monitoring of bulk materials
 - Projection monitoring

SELECTION GUIDE

Line Profile Sensors

Measurement principle



In the light-section method, a linear, deflected laser beam is used to measure the profile of moving or static objects. When scanning moving objects, an additional encoder connection facilitates the creation of 3D data.

Products and typ. measurement ranges [mm]

LPS 36 from **page 320** onwards

200	800
-----	-----

Features

- Laser measurement technology with light-section method for 2D and 3D object measurement (calibrate measuring system)
- Laser line 600mm at a distance of 800mm
- Resolution 1 ... 3mm, measurement time 10ms
- Sensor activation/triggering and ability to cascade up to 9 sensors
- Compact construction 160 x 74 x 56mm
- Ethernet interface

Line Edge Sensors

Measurement principle



In the light-section method, a linear, deflected laser beam is used to measure the edge position as well as the width and height of moving or static objects. Up to 8 objects can be simultaneously measured with one sensor.

Products and typ. scanning areas [mm]

LES 36 from **page 324** onwards

200	800
-----	-----

Features

- Laser measurement technology with light-section method for width, height and position measuring
- Resolution 1 ... 3mm, measurement time 10ms
- Sensor activation/triggering and ability to cascade up to 9 sensors
- Data calculation and processing directly inside the sensor
- Compact construction 160 x 74 x 56mm
- Ethernet
- Analog interface or PROFIBUS



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Line Range Sensors

Measurement principle



In the light-section method, a linear, deflected laser beam is used to detect the presence of moving or static objects. Up to 16 objects can be simultaneously detected with one sensor.

Products and typ. scanning areas [mm]

LRS 36 from **page 328** onwards
200 800

Features

- Laser scanning with light-section method for object detection
- Minimum object size 3 ... 6mm, response time 10ms
- Sensor activation/triggering and ability to cascade up to 9 sensors
- Data calculation and processing directly inside the sensor
- Compact construction 160 x 74 x 56mm
- Ethernet
- I/O interface or PROFIBUS



Detailed product information can be found at www.leuze.com.

SELECTION TABLE

Series	Dimensions in mm (WxHxD)	Housing material		Typ. measurement range [mm]				
		Plastic	Metal	200	500	5000	65000	
 ODSL 8	15 x 48 x 38		●	20 — 500				
 ODSL 9	21 x 50 x 50	●		50 — 650				
 ODS 96(B) ODKL 96B	30 x 90 x 70	●	●	60 — 25000				
 ODSL 30	79 x 70 x 150		●	200 — 30000 — 65000				

We reserve the right to make changes • Auswahl_MessendeSensoren_ODS_EN.fm

OPTICAL DISTANCE SENSORS



Operating voltage		Light source			Switching output								Connection		Page
10 ... 30VDC	18 ... 30VDC	Infrared light	Red light	Laser	Analog / Current	Analog / Voltage	Serial / RS 232	Serial / RS 485	PNP switching outputs	NPN switching outputs	Push-pull switching outputs	Warning outp. PNP / NPN	M12 connector	Terminals	
●	●			●	●	●	●	●	●	●	●		●		268
●	●			●	●	●	●	●	●	●	●		●		272
●	●	●	●	●	●	●	●	●	●	●	●	●	●		286
●	●			●	●	●	●	●	●	●			●		282

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW OF OPTICAL DISTANCE SENSORS



Stack positioning

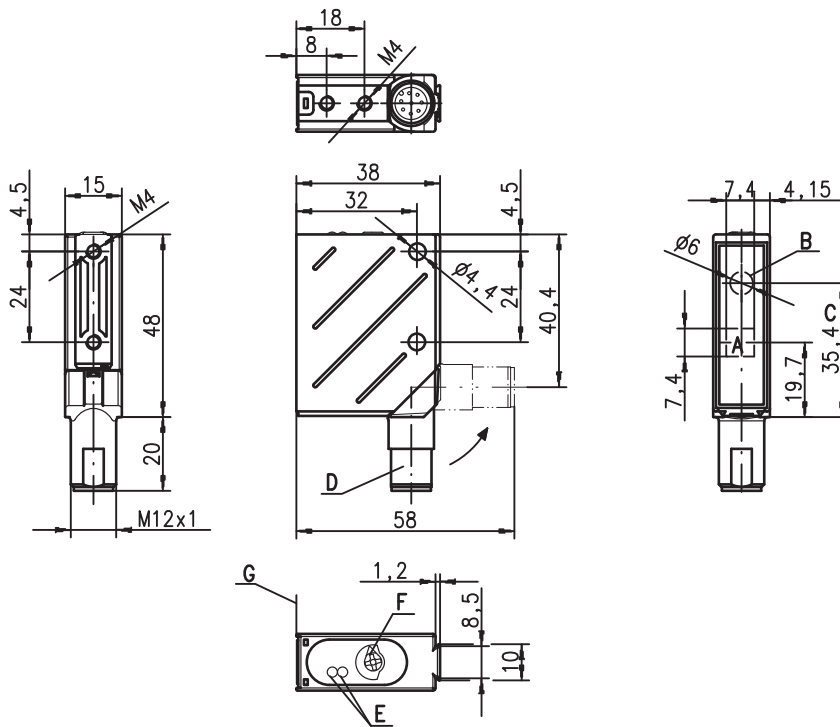


Diameter determination




Orientation position inspection












Dimensioned drawing



- A Receiver
- B Transmitter
- C Optical axis
- D 90° turning connector
- E Yellow, green LED
- F Operational control (rotary switch)
- G Reference edge for the measurement (cover glass)

 Further details can be found in the respective data sheet.

We reserve the right to make changes • ODSL8_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODSL 8

Optical distance sensors	Measurement range	Page
 Optical distance sensors ODSL 8	20 ... 500mm	270

Other 8 Series products:

	Throughbeam sensors	LSR 8, LSRL 8	72
	Retro-reflective sensors	PRK 8, PRKL 8	74
	Diffuse reflection scanners	RTR 8, VRTR 8, HRTR 8, HRTL 8	78
	Luminescence scanners	LRT 8	496



Common technical data

Electrical data	Operating voltage U_B	10 ... 30/18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 50\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2V) / \leq 2V$
Indicators	Green LED	Ready to operate
	Yellow LED	Obj. detected, teach-in
Mechanical data	Housing	Metal
	Optics cover	Glass
	Weight (connector/cable)	70g
Environmental data	Ambient temperature (operation)	$-40^\circ\text{C} \dots +50^\circ\text{C}$
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 69K
	Laser class	2 acc. to EN 60825-1
	Standards applied	IEC 60947-5-2

Mounting systems for this series can be found from page 629 onwards

Features

- Measurement range 20 ... 500mm
- Resolution up to 0.01 mm
- High measurement accuracy
- PC configuration provides high flexibility



Optical Sensor

- Optical distance sensors Page 691

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical laser distance sensors						
ODSL 8 / C66 - 45 - S12 50108364	<input type="checkbox"/> 25 ... 45 ²⁾	18 ... 30VDC	Red light laser, class 2 Ø 1 mm	Analog/mA 2x push-pull	M12 connector	≤ 7
ODSL 8 / V66 - 45 - S12 50108363	<input type="checkbox"/> 25 ... 45 ²⁾	18 ... 30VDC	Red light laser, class 2 Ø 1 mm	Analog/V 2x push-pull	M12 connector	≤ 7
ODSL 8 / C66 - 200 - S12 50108362	<input type="checkbox"/> 20 200 ³⁾	18 ... 30VDC	Red light laser, class 2 1 x 6mm ²	Analog/mA 2x push-pull	M12 connector	≤ 7
ODSL 8 / V66 - 200 - S12 50105761	<input type="checkbox"/> 20 200 ³⁾	18 ... 30VDC	Red light laser, class 2 1 x 6mm ²	Analog/V 2x push-pull	M12 connector	≤ 7
ODSL 8 / C66 - 500 - S12 50108361	<input type="checkbox"/> 20 500 ³⁾	18 ... 30VDC	Red light laser, class 2 1 x 6mm ²	Analog/mA 2x push-pull	M12 connector	≤ 7
ODSL 8 / V66 - 500 - S12 50101879	<input type="checkbox"/> 20 500 ³⁾	18 ... 30VDC	Red light laser, class 2 1 x 6mm ²	Analog/V 2x push-pull	M12 connector	≤ 7
ODSL 8 / V66.01 - 500 - S12 50111175	<input type="checkbox"/> 20 500 ³⁾	18 ... 30VDC	Red light laser, class 2 2x 6mm ²	Analog/V 2x push-pull	M12 connector	≤ 7
ODSL 8 / 66 - 500 - S12 50101880	<input type="checkbox"/> 20 500 ³⁾	18 ... 30VDC	Red light laser, class 2 1 x 6mm ²	2 x push-pull	M12 connector	≤ 7

1) At the measurement range end value

2) Luminosity coefficient 6 ... 90%, at 20°C, measurement object ≥ 20x20mm²












3) Luminosity coefficient 6 ... 90%, at 20°C, measurement object ≥ 50x50mm²

We reserve the right to make changes • ODSL8_1_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODSL 8
Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability ⁴⁾	Resolution [mm]	Option	Accessories
± 1.5% ²⁾	±0.2%	0.03	1	a, b, c, d
± 1.5% ²⁾	±0,2%	0.03	1	a, b, c, d
± 2% ³⁾	± 1%	0.1 ... 0.2 ⁵⁾	1	a, b, c, d
± 2% ³⁾	± 1%	0.1 ... 0.2 ⁵⁾	1	a, b, c, d
± 2 ... ± 4% ³⁾	± 1 ... ± 3%	0.1 ... 0.5 ⁵⁾	1	a, b, c, d
± 2 ... ± 4% ³⁾	± 1 ... ± 3%	0.1 ... 0.5 ⁵⁾	1	a, b, c, d
± 2 ... ± 4% ³⁾	± 1 ... ± 3%	0.1 ... 0.5 ⁵⁾	1	a, b, c, d
± 2 ... ± 4% ³⁾	± 1 ... ± 3%	0.1 ... 0.5 ⁵⁾	1, 2	a, b, c, d

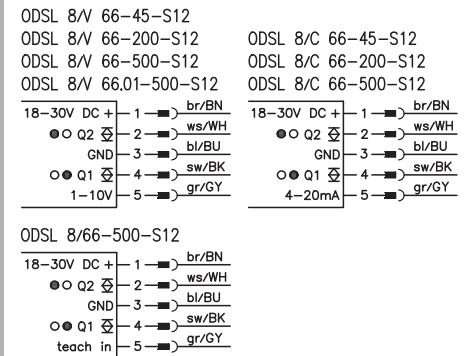
4) Same object, identical environmental conditions, measurement object ≥ 50x50mm²
5) Minimum and maximum value depend on measurement distance



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

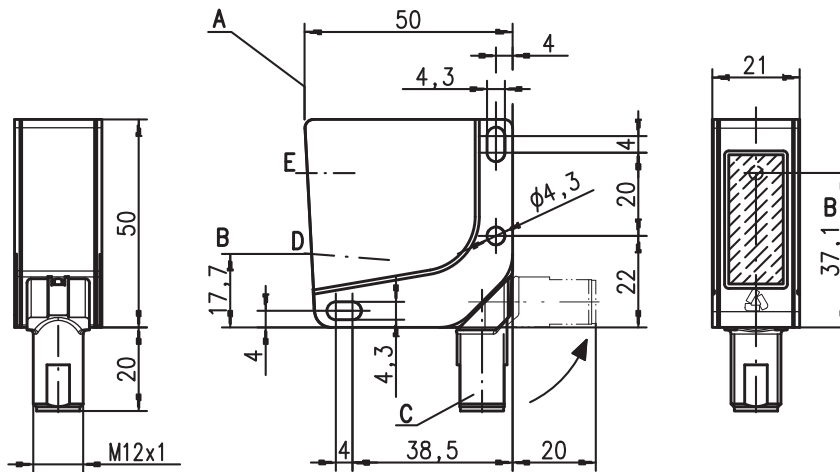


Options

- 1 Teach-in via rotary switch
- 2 Teach-in via teach input

OVERVIEW OF OPTICAL DISTANCE SENSORS

Dimensioned drawing














- A** Reference edge for the measurement
- B** Optical axis
- C** M12 device plug, can be turned 90°
- D** Receiver
- E** Transmitter
- F** LCD display
- G** Yellow indicator diode
- H** Green indicator diode
- J** Control buttons




Further details can be found in the respective data sheet.

We reserve the right to make changes • ODSL9_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODSL 9




Optical distance sensors	Measurement range	Page
 Optical distance sensors ODSL 9	50 ... 650mm	274



Common technical data		
Electrical data	Operating voltage U_B	10 ... 30/18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 180\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Obj. detected, teach-in
Mechanical data	Housing	Plastic
	Optics cover	Glass
	Weight	Approx. 50g
Environmental data	Ambient temperature (operation)	$-20^\circ\text{C} \dots +50^\circ\text{C}$
	VDE safety class	II, all-insulated
	Protection class	IP 67
	Laser class	2 acc. to EN 60825-1
	Standards applied	IEC 60947-5-2
	Certifications	for the North American market in preparation
Mounting systems for this series can be found from page 629 onwards		

Features

- LCD measurement value display in mm
- Measurement range 50 ... 650mm
- Resolution up to 0.01mm
- High measurement accuracy
- Menu-driven configuration via LCD display/control buttons or via configuration software
- Laser class 1 and class 2

Optical Sensor	
● Optical distance sensors	Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Measurement time [ms] ²⁾
Optical laser distance sensors						
ODSL 9 / C6 - 100 - S12 50111167	50 100 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/mA 1 x push-pull	M12 connector	2
ODSL 9 / V6 - 100 - S12 50111168	50 100 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/V 1 x push-pull	M12 connector	2
ODSL 9 / C66 - 100 - S12 50111171	50 100 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/mA 2 x push-pull	M12 connector	2
ODSL 9 / V66 - 100 - S12 50111172	50 100 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/V 2 x push-pull	M12 connector	2
ODSL 9 / D26 - 100 - S12 50111169	50 100 ²⁾	10 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Serial/RS 232 1 x push-pull	M12 connector	2
ODSL 9 / D36 - 100 - S12 50111170	50 100 ²⁾	10 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Serial/RS 485 1 x push-pull	M12 connector	2
ODSL 9 / 66 - 100 - S12 50111173	50 100 ²⁾	10 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	2 x push-pull	M12 connector	2
ODSL 9 / L - 100 - S12 50111174	50 100 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	IO-Link COM2	M12 connector	2

1) At the measurement range end value

2) Luminosity coefficient 6% ... 90%, complete measurement range, "Standard" operating mode, at 20°C, medium range of U_B, measurement object ≥ 50x50mm²












3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²

We reserve the right to make changes • ODSL9_1_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODSL 9
Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

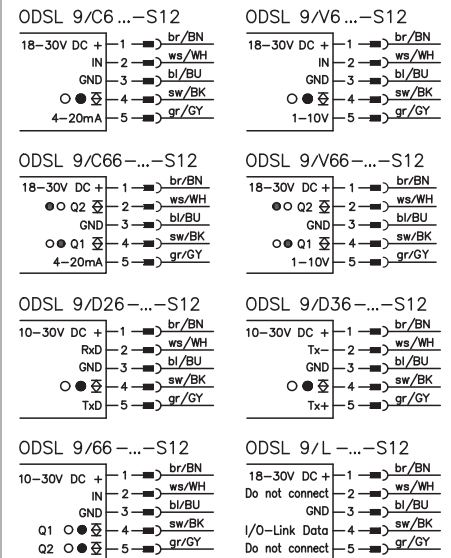
Abs. meas. accuracy	Repeatability ³⁾	Resolution [mm]	Option	Accessories
± 0.5% ²⁾	± 0,25%	0.01	1, 2, 3, 5	a, b, c, d, e, f
± 0.5% ²⁾	± 0,25%	0.01	1, 2, 3, 5	a, b, c, d, e, f
± 0.5% ²⁾	± 0,25%	0.01	1, 3, 5	a, b, c, d, e, f
± 0.5% ²⁾	± 0,25%	0.01	1, 3, 5	a, b, c, d, e, f
± 0.5% ²⁾	± 0,25%	0.01	1, 3, 4, 5	a, b, c, d, e, f
± 0.5% ²⁾	± 0,25%	0.01	1, 3, 5	a, b, c, d, e, f
± 0.5% ²⁾	± 0,25%	0.01	1, 2, 3, 5	a, b, c, d, e, f
± 0.5% ²⁾	± 0,25%	0.01	1, 3, 5	a, b, c, d, e, f



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Configuration software - free download at www.leuze.com.

Options

- 1 PC/LC display and control buttons for configuration
- 2 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 3 Adjustable measurement range and measurement mode
- 4 Direct connection to MA 2xxi fieldbus gateway possible, see page 661
- 5 Certification for the North American market in preparation

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Measurement time [ms] ²⁾
Optical laser distance sensors						
ODSL 9 / C6 - 450 - S12 50111157	50 450 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/mA 1 x push-pull	M12 connector	2
ODSL 9 / C6.C1 - 450 - S12 50115029	50 450 ²⁾	18 ... 30VDC	Red light laser, class 1 1 x 1 mm ²	Analog/mA 1 x push-pull	M12 connector	4
ODSL 9 / V6 - 450 - S12 50111158	50 450 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/V 1 x push-pull	M12 connector	2
ODSL 9 / V6.C1 - 450 - S12 50115030	50 450 ²⁾	18 ... 30VDC	Red light laser, class 1 1 x 1 mm ²	Analog/V 1 x push-pull	M12 connector	4
ODSL 9 / C66 - 450 - S12 50111161	50 450 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/mA 2 x push-pull	M12 connector	2
ODSL 9 / V66 - 450 - S12 50111162	50 450 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/V 2 x push-pull	M12 connector	2

1) At the measurement range end value












2) Luminosity coefficient 6% ... 90%, complete measurement range, "Standard" operating mode, at 20°C, medium range of U_B, measurement object ≥ 50x50mm²

3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²

We reserve the right to make changes • ODSL9_2_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

										
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ODSL 9

Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

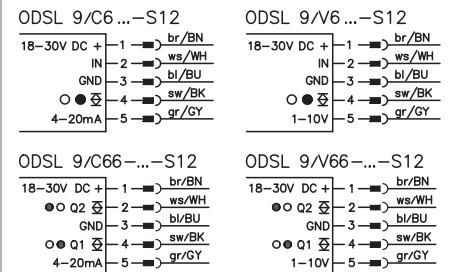
Abs. meas. accuracy	Repeatability ³⁾	Resolution [mm]	Option	Accessories
± 1.0% ²⁾	± 0,5%	0.1	1, 2, 3, 4	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1	1, 2, 3, 4	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1	1, 2, 3, 4	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1	1, 2, 3, 4	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1	1, 3, 4	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1	1, 3, 4	a, b, c, d, e, f



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Configuration software - free download at www.leuze.com.

Options

- 1 PC/LC display and control buttons for configuration
- 2 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 3 Adjustable measurement range and measurement mode
- 4 Certification for the North American market in preparation

www.leuze.com/en/measuring-sensors/

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Measurement time [ms] ²⁾
Optical laser distance sensors						
ODSL 9 / D26 - 450 - S12 50111159	50 450 ²⁾	10 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Serial/RS 232 1 x push-pull	M12 connector	2
ODSL 9 / D36 - 450 - S12 50111160	50 450 ²⁾	10 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Serial/RS 485 1 x push-pull	M12 connector	2
ODSL 9 / 66 - 450 - S12 50111163	50 450 ²⁾	10 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	2 x push-pull	M12 connector	2
ODSL 9 / L - 450 - S12 50111166	50 450 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	IO-Link COM2	M12 connector	2

1) At the measurement range end value












2) Luminosity coefficient 6% ... 90%, complete measurement range, "Standard" operating mode, at 20 °C, medium range of U_B, measurement object ≥ 50x50mm²

3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²

We reserve the right to make changes • ODSL9_3_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

										
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ODSL 9

Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability ³⁾	Resolution [mm]	Option	Accessories
± 1.0% ²⁾	± 0,5%	0.1	1, 3, 4, 5	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1	1, 3, 5	a, b, c, d, e, f
± 1.0% ²⁾	± 0.5%	0.1	1, 2, 3, 5	a, b, c, d, e, f
± 1.0% ²⁾	± 0.5%	0.1	1, 3, 5	a, b, c, d, e, f

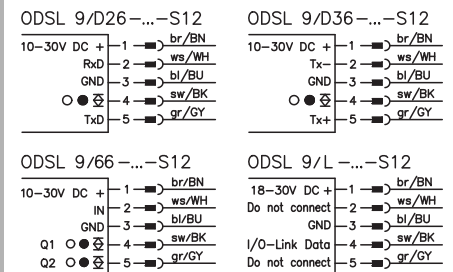


Configuration software - free download at www.leuze.com.

Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 PC/LC display and control buttons for configuration
- 2 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 3 Adjustable measurement range and measurement mode
- 4 Direct connection to MA 2xxi fieldbus gateway possible, see page 661
- 5 Certification for the North American market in preparation

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Measurement time [ms] ²⁾
Optical laser distance sensors						
ODSL 9 / C6 - 650 - S12 50113583	50 650 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/mA 1 x push-pull	M12 connector	2
ODSL 9 / V6 - 650 - S12 50114627	50 650 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Analog/V 1 x push-pull	M12 connector	2
ODSL 9 / D36 - 650 - S12 50120000	50 650 ²⁾	18 ... 30VDC	Red light laser, class 2 1 x 1 mm ²	Serial/RS 485 1 x push-pull	M12 connector	2

1) At 450mm












2) Luminosity coefficient 6% ... 90%, complete measurement range, "Standard" operating mode, at 20°C, medium range of U_B, measurement object ≥ 50x50mm²

3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²

We reserve the right to make changes • ODSL9_4_EN.fm

Accessories / connection cables More accessories can be found from page 634 onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

										
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ODSL 9

Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors



Abs. meas. accuracy	Repeatability ³⁾	Resolution [mm]	Option	Accessories
± 1.0% ²⁾	± 0,5%	0.1 ... 0.5	1, 2, 3, 4	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1 ... 0.5	1, 2, 3, 4	a, b, c, d, e, f
± 1.0% ²⁾	± 0,5%	0.1 ... 0.5	1, 3, 4	a, b, c, d, e, f

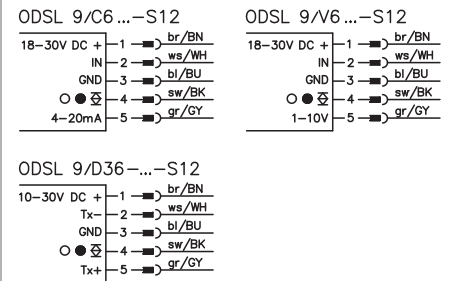


Configuration software - free download at www.leuze.com.

Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



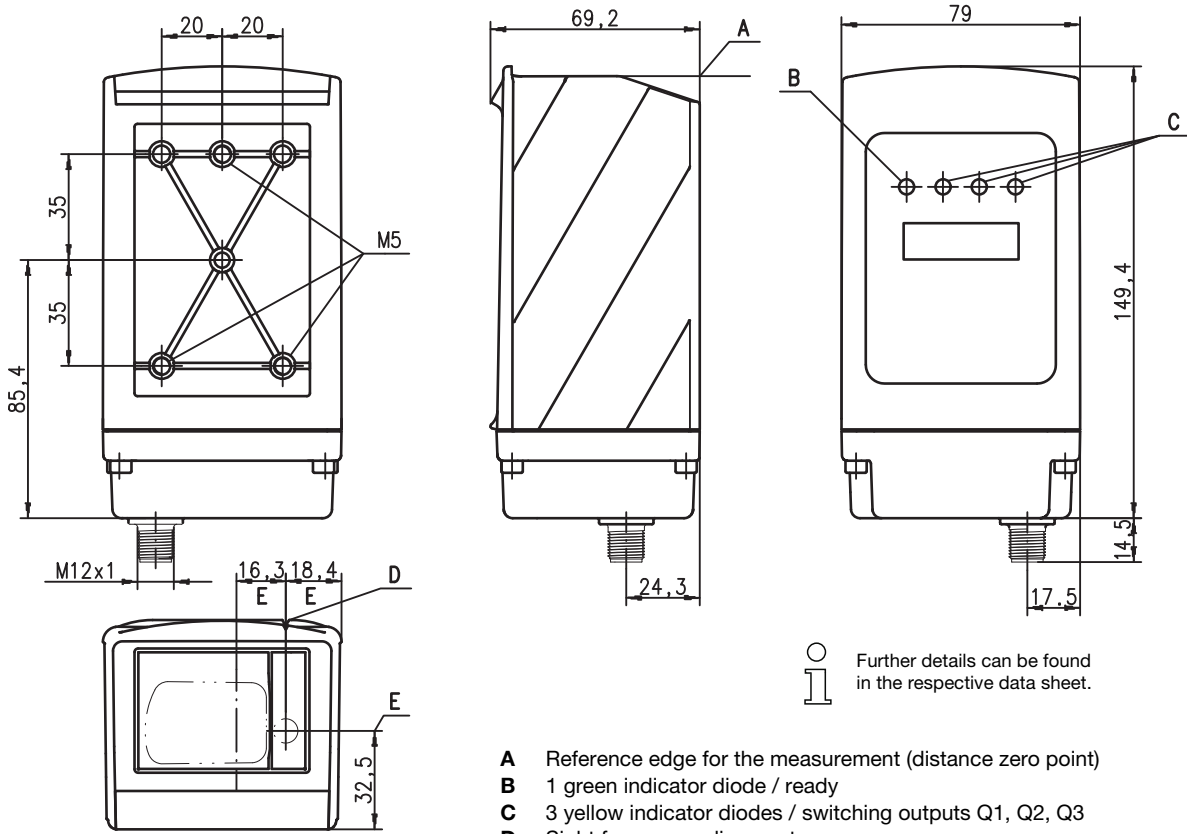
Options


- 1 PC/LC display and control buttons for configuration
- 2 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 3 Adjustable measurement range and measurement mode
- 4 Certification for the North American market in preparation

www.leuze.com/en/measuring-sensors/

OVERVIEW OF OPTICAL DISTANCE SENSORS












Dimensioned drawing




 Further details can be found in the respective data sheet.

- A** Reference edge for the measurement (distance zero point)
- B** 1 green indicator diode / ready
- C** 3 yellow indicator diodes / switching outputs Q1, Q2, Q3
- D** Sight for coarse alignment
- E** Optical axes

We reserve the right to make changes • ODSL30_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODSL 30





Optical distance sensors	Measurement range	Page
 Optical distance sensors ODSL 30	0.2 ... 30m	284



Common technical data		
Electrical data	Operating voltage U_B	10 ... 30/18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Power consumption	$\leq 4W$
	Signal voltage high/low	$\geq (U_B - 2V) / \leq 2V$
Indicators	Green LED	Ready to operate
	Yellow LEDs	Switching outputs
Mechanical data	Housing	Metal
	Optics cover	Glass
	Weight	650g
Environmental data	Ambient temperature (operation)	$-10^\circ C \dots +45^\circ C$
	VDE safety class	II, all-insulated
	Protection class	IP 65
	Standards applied	IEC 60947-5-2, UL 508
Mounting bracket BT 30 included in delivery contents		

Features

- Measurement range up to 30m
- Resolution 1 mm
- High measurement accuracy through internal referencing
- LCD display and key pad for configuration and measurement value display

Optical Sensor	
● Optical distance sensors	Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [m] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical laser distance sensors						
ODSL 30 / V - 30M - S12 50039447	0.2 30 ²⁾	18 ... 30VDC	Red light laser, class 2 Ø 6 mm	Analog/mA/V 1 PNP/NPN	M12 connector	≤ 100
ODSL 30 / D 232 - 30M - S12 50041203	0.2 30 [65] ^{2) 4)}	10 ... 30VDC	Red light laser, class 2 Ø 6 mm	Serial/RS 232 2 PNP/NPN	M12 connector	≤ 100
ODSL 30 / D 485 - 30M - S12 50041204	0.2 30 [65] ^{2) 4)}	10 ... 30VDC	Red light laser, class 2 Ø 6 mm	Serial/RS 485 2 PNP/NPN	M12 connector	≤ 100
ODSL 30 / 24 - 30M - S12 50040720	0.2 30 ²⁾	10 ... 30VDC	Red light laser, class 2 Ø 6 mm	3 PNP/NPN	M12 connector	≤ 100

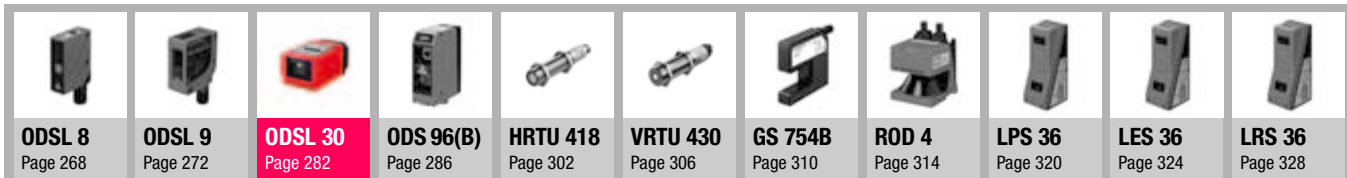
- 1) At a distance of 10mm
- 2) Luminosity coefficient 6 ... 90%, temperature range 0°C ... +45°C, measurement object ≥ 50x50mm², with referencing
- 3) Same object, identical environmental conditions
- 4) ODSL 30 / D... up to 65m, luminosity coefficient 50 ... 90%
- 5) Display and output resolution 0.1 mm configurable

We reserve the right to make changes • ODSL30_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104591	K - D M12A - 8P - 2m - PUR	Connection cable 2000mm, M12 axial, 8-pin, PUR
b 50104590	K - D M12A - 8P - 5m - PUR	Connection cable 5000mm, M12 axial, 8-pin, PUR
c 50104599	CTS 100 x 100	Cooperative target, 100mm x 100mm, screw type



ODSL 30

Optical distance sensors



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light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

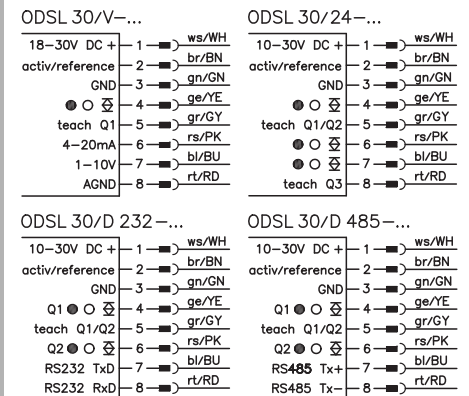
Abs. meas. accuracy ²⁾	Repeatability ³⁾	Resolution [mm] ⁵⁾	Option	Accessories
± 1%	± 0.5%	0.1 / 1	1, 2, 3, 5	a, b, c
± 2mm	± 2mm	0.1 / 1	1, 2, 3, 4, 5	a, b, c
± 2mm	± 2mm	0.1 / 1	1, 2, 3, 5	a, b, c
± 2mm	± 2mm	0.1 / 1	1, 2, 3, 5	a, b, c



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

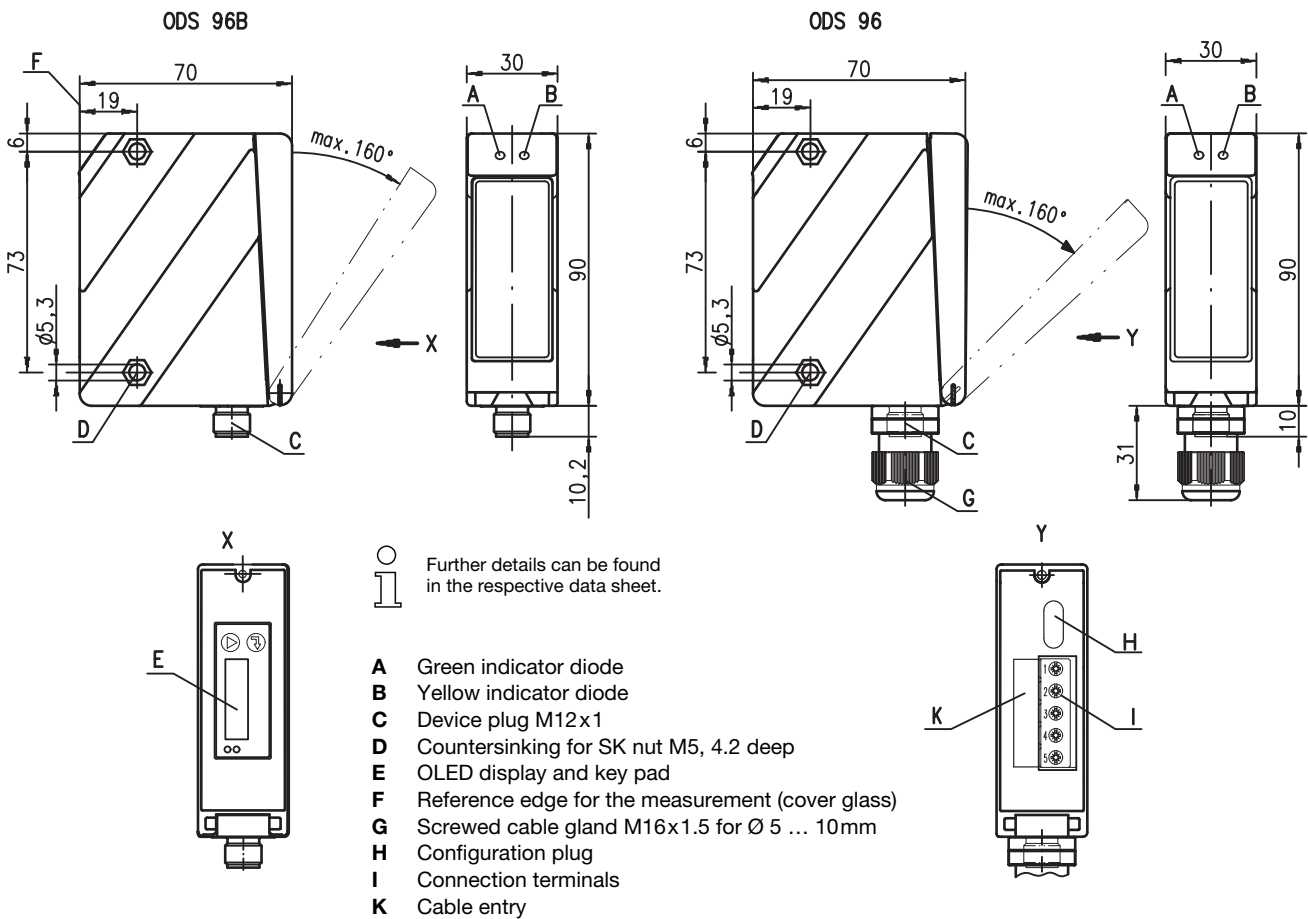
- 1 Teach-in of the switching points via teach input or keyboard entry
- 2 Configurable activation/referencing input
- 3 Menu-driven configuration via LC display and key pad
- 4 Direct connection to MA 2xxi fieldbus gateway possible, see page 661
- 5 UL approval

OVERVIEW OF OPTICAL DISTANCE SENSORS



Pallet detection


Dimensioned drawing









We reserve the right to make changes • ODS96_Overview_EN.fm

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ODS 96(B)

Optical distance sensors	Measurement range	Page
 Optical distance sensors ODS... 96(B)	60 ... 25000mm	288

Other 96 Series products:

	Throughbeam sensors	LS 96	178
	Retro-reflective sensors	RK 96, PRK 96	182
	Diffuse reflection scanners	RT 96, HRT 96	188
	Protective sensors	SLS 96	602
	Ex Sensors	LS 96, SLS 96, PRK 96, HRT 96, ODS 96	612
	AS-interface sensors	LS 96, PRK 96, HRT 96	622

Common technical data

Electrical data	Operating voltage U_B	10 ... 30/18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	≤ 150 mA
	Signal voltage high/low	$\geq (U_B - 2V) \leq 2V$
Indicators	Green LED	Ready to operate
	Yellow LED	Obj. detected, teach-in
Mechanical data	Housing	Metal or plastic
	Optics cover	Glass or plastic
	Weight (metal/plastic)	380g/140g
Environmental data	Ambient temperature (operation)	-20°C ... +50°C ODSL 96 K...: -20°C ... +40°C
	VDE safety class	II, all-insulated
	Protection class	IP 67, IP 69K ¹⁾
	Standards applied	IEC 60947-5-2
	Certifications	for the North American market in preparation

1) IP 69K only with metal housing

Mounting systems for this series can be found from page 640 onwards



Features

- **Measurement range 60 ... 25000mm**
- **Resolution up to 0.1 mm**
- **High measurement accuracy**
- **OLED display and key pad for configuration (ODS 96B)**
- **PC configuration provides high flexibility**



Optical Sensor

- Optical distance sensors Page 691

Photoel. sensors/
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cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OPTICAL DISTANCE SENSORS












Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical distance sensors with visible red light in metal housing						
ODSR 96B/C6 - 600 - S12 50106730	100 600 ²⁾	18 ... 30VDC	Red light 15 x 15 mm ²	Analog/mA 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODSR 96B/V6 - 600 - S12 50106731	100 600 ²⁾	18 ... 30VDC	Red light 15 x 15 mm ²	Analog/V 1 x push-pull	M12 connector	1 ... 5 ²⁾

1) At measurement distance of 600mm

2) Luminosity coefficient 6 ... 90%, complete measurement range, at 20°C, medium range U_B, measurement object ≥ 50x50mm².
With serial interface: depending on the measurement transmission mode and the baud rate

We reserve the right to make changes • ODS96B_1_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODS 96B

Optical distance sensors



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Photoel. sensors/
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cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability	Resolution [mm]	Option	Accessories
$\pm 1.5\% ^2)$	$\pm 0.5\% ^3)$	0.1 ... 0.5 ⁴⁾	1, 2, 3, 4	a, b, c, d, e, f
$\pm 1.5\% ^2)$	$\pm 0.5\% ^3)$	0.1 ... 0.5 ⁴⁾	1, 2, 3, 4	a, b, c, d, e, f

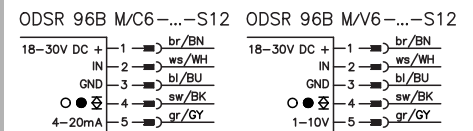
3) Same object, identical environmental conditions, measurement object $\geq 50 \times 50 \text{mm}^2$
 4) Minimum and maximum value depend on measurement distance



Optical Sensor

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- Connection types Page 694
- Outputs Page 694

Electrical connection



Configuration software - free download at www.leuze.com.

Options

- 1 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 2 Adjustable measurement range and measurement mode
- 3 PC/OLED display and key pad for configuration
- 4 Certification for the North American market in preparation

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical distance sensors with invisible infrared light in metal housing						
ODS 96B M/C6 - 600 - S12 50106720	100 600 ²⁾	18 ... 30VDC	Infrared light 15 x 15 mm ²	Analog/mA 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODS 96B M/V6 - 600 - S12 50106721	100 600 ²⁾	18 ... 30VDC	Infrared light 15 x 15 mm ²	Analog/V 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODS 96B M/66 - 600 - S12 50106724	100 600 ²⁾	10 ... 30VDC	Infrared light 15 x 15 mm ²	2 push-pull	M12 connector	1 ... 5 ²⁾
ODS 96B M/C66.01 - 1400 - S12 50106727	120 1400 ²⁾	18 ... 30VDC	Infrared light 15 x 15 mm ²	Analog/mA 2 x push-pull	M12 connector	1 ... 5 ²⁾
ODS 96B M/V6 - 1400 - S12 50110231	120 1400 ²⁾	18 ... 30VDC	Infrared light 15 x 15 mm ²	Analog/V 1 x push-pull	M12 connector	1 ... 5 ²⁾

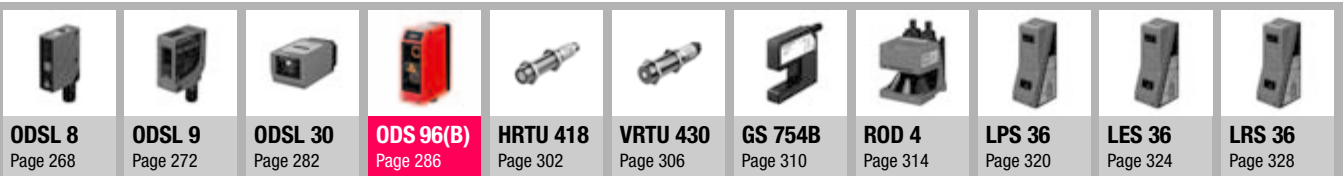
1) At measurement distance of 600mm

2) Luminosity coefficient 6 ... 90%, complete measurement range, at 20°C, medium range U_B, measurement object ≥ 50x50mm².
With serial interface: depending on the measurement transmission mode and the baud rate

We reserve the right to make changes • ODS96B_4_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B



ODS 96B
Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability	Resolution [mm]	Option	Accessories
± 1.5% ²⁾	± 0.5% ³⁾	0.1 ... 0.5 ⁴⁾	1, 2, 4, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	0.1 ... 0.5 ⁴⁾	1, 2, 4, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	0.1 ... 0.5 ⁴⁾	1, 2, 4, 5	a, b, c, d, e, f
± 2% ²⁾	± 1% ³⁾	0.1 ... 0.5 ⁴⁾	2, 3, 4, 5	a, b, c, d, e, f
± 2% ²⁾	± 1% ³⁾	0.1 ... 0.5 ⁴⁾	1, 2, 4, 5	a, b, c, d, e, f

3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²
4) Minimum and maximum value depend on measurement distance



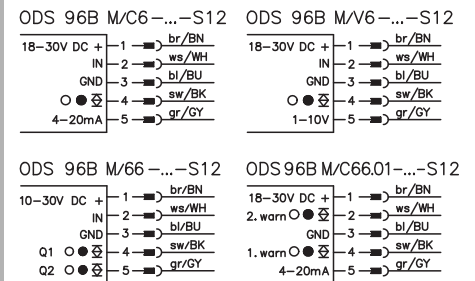
Optical Sensor

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- Connection types Page 694
- Outputs Page 694



Configuration software - free download at www.leuze.com.

Electrical connection



Options

- 1 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 2 Adjustable measurement range and measurement mode
- 3 2 warning outputs (for signaling 4 different device states)
- 4 PC/OLED display and key pad for configuration
- 5 Certification for the North American market in preparation

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical laser distance sensors with visible red light in metal housing						
ODSL 96B M/C6.S - 800 - S12 50106728	150 800 ²⁾	18 ... 30VDC	Red light laser class 2 1 x 1 mm ²	Analog/mA 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/V6.S - 800 - S12 50106729	150 800 ²⁾	18 ... 30VDC	Red light laser class 2 1 x 1 mm ²	Analog/V 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/D26.S - 800 - S12 50111035	150 800 ²⁾	10 ... 30VDC	Red light laser class 2 1 x 1 mm ²	Serial/RS 232 1 push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/D36.S - 800 - S12 50112065	150 800 ²⁾	10 ... 30VDC	Red light laser class 2 1 x 1 mm ²	Serial/RS 485 1 push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/C6-1200-XL-S12 50106736	150 1200 ²⁾	18 ... 30VDC	Red light laser class 2 15 x 4 mm ²	Analog/mA 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/V6-1200-XL-S12 50106737	150 1200 ²⁾	18 ... 30VDC	Red light laser class 2 15 x 4 mm ²	Analog/V 1 x push-pull	M12 connector	1 ... 5 ²⁾

1) At measurement distance of 800mm












2) Luminosity coefficient 6% ... 90%, complete measurement range, at 20°C, medium range of U_B, measurement object ≥ 50x50mm²



Configuration software - free download at www.leuze.com.

We reserve the right to make changes • ODS96B_2_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

										
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ODS 96B

Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability	Resolution [mm]	Option	Accessories
± 1.5% ²⁾	± 0.5% ³⁾	0.1 ... 0.8 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	0.1 ... 0.8 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	2, 3, 4, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	0.1 ... 1.5 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	0.1 ... 1.5 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f

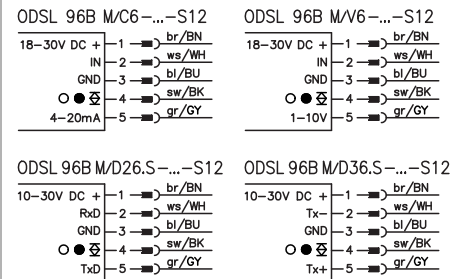
3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²
4) Minimum and maximum value depend on measurement distance



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 2 Adjustable measurement range and measurement mode
- 3 PC/OLED display and key pad for configuration
- 4 Direct connection to MA 2xxi fieldbus gateway possible, see page 661
- 5 Certification for the North American market in preparation

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical laser distance sensors with visible red light in metal housing						
ODSL 96B M/C6 - 2000 - S12 50106593	150 2000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6mm ²	Analog/mA 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/V6 - 2000 - S12 50106594	150 2000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6mm ²	Analog/V 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/D26 - 2000 - S12 50106597	150 2000 ²⁾	10 ... 30VDC	Red light laser class 2 2 x 6mm ²	Serial/RS 232 1 push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/D36 - 2000 - S12 50106598	150 2000 ²⁾	10 ... 30VDC	Red light laser class 2 2 x 6mm ²	Serial/RS 485 1 push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/66 - 2000 - S12 50106599	150 2000 ²⁾	10 ... 30VDC	Red light laser class 2 2 x 6mm ²	2 push-pull	M12 connector	1 ... 5 ²⁾
ODSL 96B M/L - 2000 - S12 50111164	150 2000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6mm ²	IO-Link COM2	M12 connector	1 ... 5 ²⁾
ODSLR 96B M/C6 - 2000 - S12 50106732	60 2000 ²⁾	18 ... 30VDC	Red light, LED+ laser class 2	Analog/mA 1 x push-pull	M12 connector	1 ... 5 ²⁾
ODSLR 96B M/V6 - 2000 - S12 50106733	60 2000 ²⁾	18 ... 30VDC	Red light, LED+ laser class 2	Analog/V 1 x push-pull	M12 connector	1 ... 5 ²⁾

1) At measurement distance of 2000mm

2) Luminosity coefficient 6 ... 90%, complete measurement range, at 20°C, medium range U_B, measurement object ≥ 50x50mm².
With serial interface: depending on the measurement transmission mode and the baud rate








Configuration software - free download at www.leuze.com.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

We reserve the right to make changes • ODS96B_3_EN.fm

										
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ODS 96B
Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
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Measuring
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Sensors

Special
Sensors

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Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability	Resolution [mm]	Option	Accessories
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	2, 3, 4, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f
± 1.5% ²⁾	± 0.5% ³⁾	1 ... 3 ⁴⁾	1, 2, 3, 5	a, b, c, d, e, f

3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²
4) Minimum and maximum value depend on measurement distance

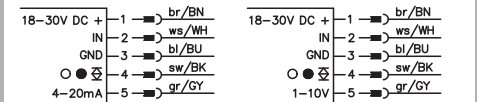


Optical Sensor

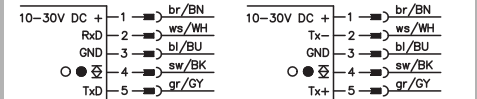
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Electrical connection

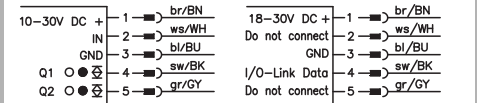
ODSL 96B M/C6-...-S12 ODSL 96B M/V6-...-S12
ODSLR 96B M/C6-...-S12 ODSL 96B M/V6-...-S12



ODSL 96B M/D26-...-S12 ODSL 96B M/D36-...-S12



ODSL 96B M/66-...-S12 ODSL 96B M/L-...-S12



Options

- 1 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 2 Adjustable measurement range and measurement mode
- 3 PC/OLED display and key pad for configuration
- 4 Direct connection to MA 2xxi fieldbus gateway possible, see page 661
- 5 Certification for the North American market in preparation












OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical laser distance sensors in plastic housing						
ODSL 96 K/V66 - 2300 - S12 50101881	150 2300 ²⁾	18 ... 30VDC	Red light laser, class 2 3x8mm ²	Analog/V 2xpush-pull	M12 connector	≤ 7
ODSL 96 K/66 - 2300 - S12 50101882	150 2300 ²⁾	18 ... 30VDC	Red light laser, class 2 3x8mm ²	2 x push-pull	M12 connector	≤ 7

- 1) At 2300 mm
- 2) Luminosity coefficient 6 ... 90%, at 20°C, measurement object ≥ 50x50mm²
- 3) Same object, identical environmental conditions, measurement object ≥ 50x50mm²
- 4) Minimum and maximum value depend on meas. distance/configuration of the analog output

We reserve the right to make changes • ODS96_3_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC	
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC	
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC	
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC	
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC	
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC	

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODS 96

Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

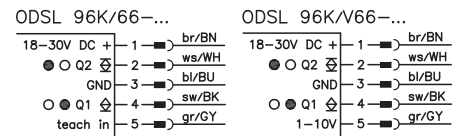
Abs. meas. accuracy	Repeatability ³⁾	Resolution [mm]	Option	Accessories
± 3% ²⁾	± 2%	1 ... 5 ⁴⁾	2	a, b, c, d, e, f
± 3% ²⁾	± 2%	1 ... 5 ⁴⁾	1, 2	a, b, c, d, e, f



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Configuration software - free download at www.leuze.com.

Options

- 1 Teach-in of the switching points via teach input
- 2 Teach-in of the switching points via teach button

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm]	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical laser distance sensors with visible red light in metal housing						
ODSL 96B M/C6 - S12 50109290	300 10000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Analog/mA 1 x push-pull	M12 connector	1.4 ... 50 ³⁾
ODSL 96B M/V6 - S12 50109291	300 10000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Analog/V 1 x push-pull	M12 connector	1.4 ... 50 ³⁾
ODSL 96B M/C66 - S12 50109295	300 10000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Analog/mA 2 x push-pull	M12 connector	1.4 ... 50 ³⁾
ODSL 96B M/D26 - S12 50109292	300 10000 ²⁾	10 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Serial/RS 232 1 push-pull	M12 connector	1.4 ... 50 ³⁾
ODSL 96B M/D36 - S12 50109293	300 10000 ²⁾	10 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Serial/RS 485 1 push-pull	M12 connector	1.4 ... 50 ³⁾
ODSL 96B M/L - S12 50109294	300 10000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6 mm ²	IO-Link COM2	M12 connector	1.4 ... 50 ³⁾
ODSIL 96B M/C6 - S12 50109302	300 10000 ²⁾	18 ... 30VDC	Infrared light laser class 1 2 x 6 mm ²	Analog/mA 1 x push-pull	M12 connector	2.8 ... 100 ³⁾
ODSIL 96B M/V6 - S12 50109303	300 10000 ²⁾	18 ... 30VDC	Infrared light laser class 1 2 x 6 mm ²	Analog/V 1 x push-pull	M12 connector	2.8 ... 100 ³⁾

1) At measurement distance of 5000mm

2) Luminosity coefficient 6 ... 90%, entire measurement range, operating mode "precision", sliding window average over 30 measurement values, at 20°C after 20min. warm-up time, median range U_B , measurement object $\geq 50 \times 50 \text{ mm}^2$. With serial interface: depending on the measurement transmission mode and the baud rate

3) Dependent on selected operating mode, factory setting: "Precision" = 50ms (ODSL...) or 100ms (ODSIL...)







Configuration software - free download at www.leuze.com.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50107223	UPG 10	Configuration adapter for ODS 96B

We reserve the right to make changes • ODS96B_5_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ODS 96B
Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability	Resolution [mm]	Option	Accessories
± 0.5% ²⁾	± 5mm ⁴⁾	3	1, 2, 3, 6	a, b, c, d, e, f
± 0.5% ²⁾	± 5mm ⁴⁾	3	1, 2, 3, 6	a, b, c, d, e, f
± 0.5% ²⁾	± 5mm ⁴⁾	3	2, 3, 6	a, b, c, d, e, f
± 0.5% ²⁾	± 5mm ⁴⁾	3	2, 3, 5, 6	a, b, c, d, e, f
± 0.5% ²⁾	± 5mm ⁴⁾	3	2, 3, 6	a, b, c, d, e, f
± 0.5% ²⁾	± 5mm ⁴⁾	3	2, 3, 6	a, b, c, d, e, f
± 0.5% ²⁾	± 5mm ⁴⁾	3	1, 2, 3, 4, 6	a, b, c, d, e, f
± 0.5% ²⁾	± 5mm ⁴⁾	3	1, 2, 3, 4, 6	a, b, c, d, e, f

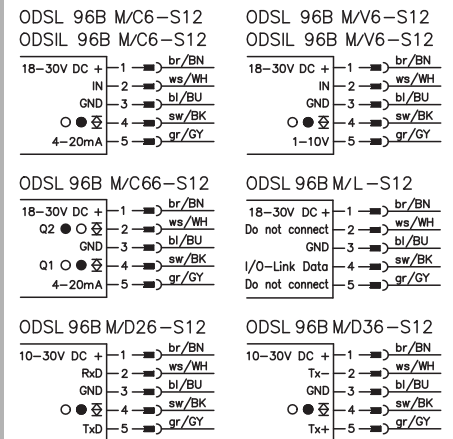
4) Same object, identical environmental conditions, "Precision" operating mode, floating average calculation taking 30 measurement values into account, at 20°C after 20min. warm-up time, measurement object ≥ 50x50mm²



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- Adjustable measurement range and measurement mode
- PC/OLED display and key pad for configuration
- Switchable red light laser alignment aid
- Direct connection to MA 2xxi fieldbus gateway possible, see page 661
- Certification for the North American market in preparation

OPTICAL DISTANCE SENSORS

Part description Part No.:	Meas. range [mm]	Operating voltage	Light source Light spot ¹⁾	Output	Connection	Meas. time [ms]
Optical laser distance sensors with visible red light in metal housing						
ODKL 96B M/C6 - S12 50109297	300 — 25000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Analog/mA 1 x push-pull	M12 connector	1.4 ... 50 ³⁾
ODKL 96B M/V6 - S12 50109298	300 — 25000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Analog/V 1 x push-pull	M12 connector	1.4 ... 50 ³⁾
ODKL 96B M/D26 - S12 50109299	300 — 25000 ²⁾	10 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Serial/RS 232 1 push-pull	M12 connector	1.4 ... 50 ³⁾
ODKL 96B M/D36 - S12 50109300	300 — 25000 ²⁾	10 ... 30VDC	Red light laser class 2 2 x 6 mm ²	Serial/RS 485 1 push-pull	M12 connector	1.4 ... 50 ³⁾
ODKL 96B M/L - S12 50109301	300 — 25000 ²⁾	18 ... 30VDC	Red light laser class 2 2 x 6 mm ²	IO-Link COM2	M12 connector	1.4 ... 50 ³⁾

- 1) At measurement distance of 5000mm
 2) Measurement against high-gain reflective tape, entire measurement range, operating mode "precision", sliding window average over 30 measurement values, at 20 °C after 20min. warm-up time, median range U_B, measurement object ≥ 50x50mm². With serial interface: depending on the measurement transmission mode and the baud rate
 3) Dependent on the selected operating mode, factory setting: "Precision" = 50ms

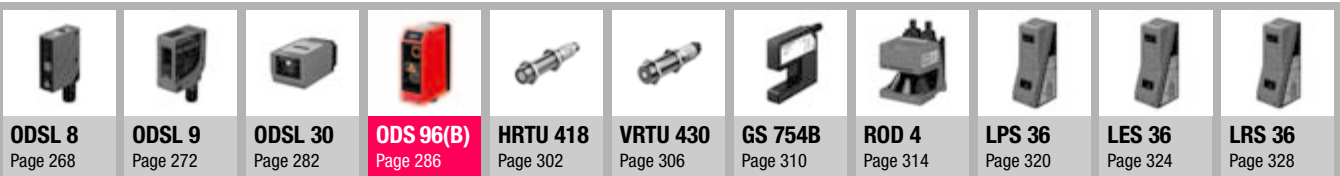


Configuration software - free download at www.leuze.com.

We reserve the right to make changes • ODS96B_6_EN.fm

Accessories / connection cables More accessories can be found from page 634 onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50111527	REF 7 - A - 100 x 100	High-gain reflective tape, width 100 mm, length 100 mm
g 50107223	UPG 10	Configuration adapter for ODS 96B



ODS 96B

Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Abs. meas. accuracy	Repeatability	Resolution [mm]	Option	Accessories
± 0.2% ²⁾	± 10mm ³⁾	3	1, 2, 3, 5	a, b, c, d, e, f, g
± 0.2% ²⁾	± 10mm ³⁾	3	1, 2, 3, 5	a, b, c, d, e, f, g
± 0.2% ²⁾	± 10mm ³⁾	3	2, 3, 4, 5	a, b, c, d, e, f, g
± 0.2% ²⁾	± 10mm ³⁾	3	2, 3, 5	a, b, c, d, e, f, g
± 0.2% ²⁾	± 10mm ³⁾	3	2, 3, 5	a, b, c, d, e, f, g

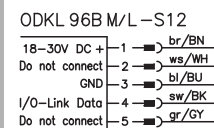
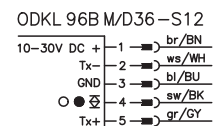
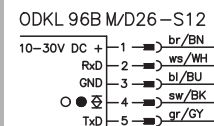
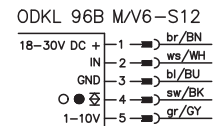
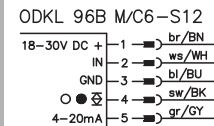
3) Same object, identical environmental conditions, "Precision" operating mode, floating average calculation taking 30 measurement values into account, at 20°C after 20min. warm-up time, measurement object ≥ 50x50mm²



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

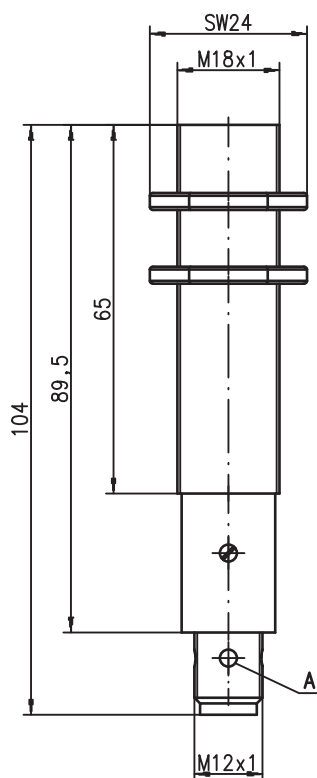



Options

- 1 Input for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- 2 Adjustable measurement range and measurement mode
- 3 PC/OLED display and key pad for configuration
- 4 Direct connection to MA 2xxi fieldbus gateway possible, see page 661
- 5 Certification for the North American market in preparation

OVERVIEW OF ULTRASONIC DISTANCE SENSORS












Dimensioned drawing




 Further details can be found in the respective data sheet.

A Indicator diode Q1

We reserve the right to make changes • HRTU418_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

HRTU 418

Ultrasonic distance sensors	Measurement range	Page
 Ultrasonic distance sensors HRTU 418	50 ... 1000mm	304

Other 418 Series products:



 Switching ultrasonic sensors	HRTU 418	348
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Common technical data		
Electrical data	Operating voltage U_B	20 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 60\text{mA}$
	Characteristic output curve	Ascending
Indicators	Yellow LED	Object detected
Mechanical data	Housing	Metal (CuZn)
	Weight	50g
Environmental data	Ambient temperature (operation)	$-25^\circ\text{C} \dots +70^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2, UL 508
	Mounting systems for this series can be found from page 630 onwards	

Features

- Sensors in M18 cylindrical housing
- Measurement range up to 1000mm
- Configuration via PC software
- Temperature compensation

Optical Sensor

- Ultrasonic distance sensors Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

ULTRASONIC DISTANCE SENSORS

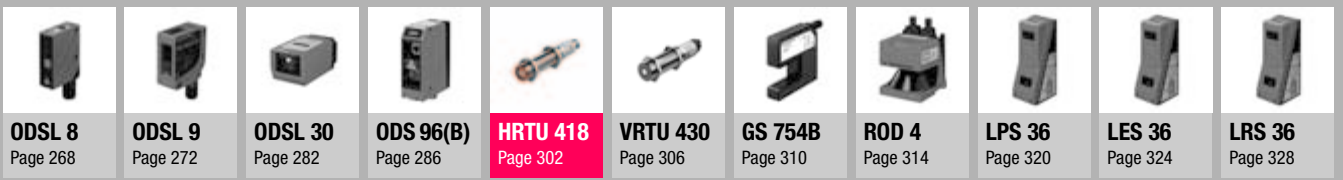
Part description Part No.:	Meas. range ¹⁾ [mm] <input type="checkbox"/>	Ultrasonic frequency	Opening angle	Output	Connection
Ultrasonic distance sensors					
HRTU 418 M/V - 5010 - 300 - S12 50036259	50 300	400 kHz	6°	Analog/mA	M12 connector
HRTU 418 M/V - 5310 - 300 - S12 50040616	50 300	400 kHz	6°	Analog/V	M12 connector
HRTU 418 M/V - 3010 - 1000 - S12 50036260	150 1000	200 kHz	6°	Analog/mA	M12 connector
HRTU 418 M/V - 3310 - 1000 - S12 50040618	150 1000	200 kHz	6°	Analog/V	M12 connector

1) Over complete temperature range, measurement object ≥ 10x10mm²
 2) Of the measurement range end value

We reserve the right to make changes • HRTU418_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50036559	PGU 01	Programming unit incl. software



HRTU 418
Ultrasonic sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

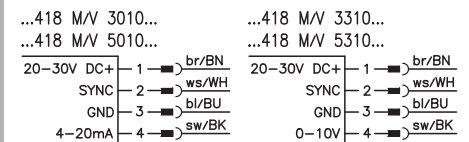
Abs. meas. accuracy ²⁾	Repeatability	Resolution [mm]	Option	Accessories
± 2.5%	± 1 mm	1	1, 2, 3, 4	a, b, c, d, e
± 2.5%	± 1 mm	1	1, 2, 3, 4	a, b, c, d, e
± 2.5%	± 2 mm	1	1, 2, 3, 4	a, b, c, d, e
± 2.5%	± 2 mm	1	1, 2, 3, 4	a, b, c, d, e



Optical Sensor

- Ultrasonic distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection




Options

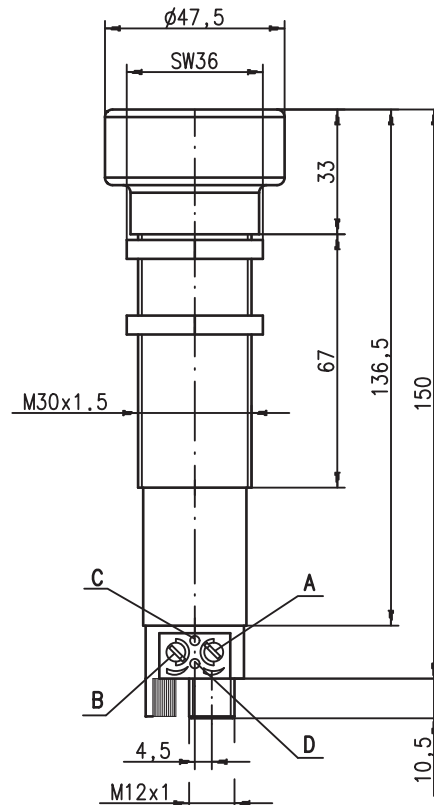
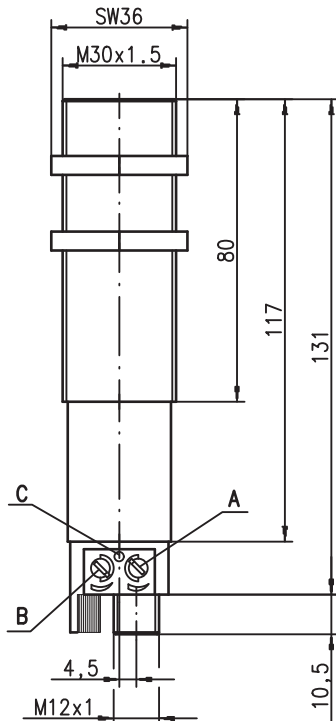
- 1 Configurable via programming unit and software
- 2 Sensor synchronization via SYNC input
- 3 Configurable multiplex operation
- 4 UL approval

OVERVIEW OF ULTRASONIC DISTANCE SENSORS












Dimensioned drawing

- A** Adjustment of end of switching range
- B** Adjustment of start of switching range
- C** Indicator diode Q1
- D** Indicator diode Q2 (...430 M/P... only)


 Further details can be found in the respective data sheet.



We reserve the right to make changes • VRTU430_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

VRTU 430

Ultrasonic distance sensors	Measurement range	Page
 Ultrasonic distance sensors VRTU 430	60 ... 6000mm	308

Other 430 Series products:

 Switching ultrasonic sensors	VRTU 430	354
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Common technical data

Electrical data	Operating voltage U_B	20 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 60\text{mA}$
	Characteristic output curve	Ascending
Indicators	Yellow LED	Switching output
	Flashing yellow LED	Programming error
Mechanical data	Housing	Metal (CuZn)
	Weight	210g ... 380g
Environmental data	Ambient temperature (operation)	$-25^\circ\text{C} \dots +70^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 65
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 632 onwards

Features

- Sensors in M30 cylindrical housing
- Measurement range up to 6000mm
- Configuration via PC software
- Temperature compensation



Optical Sensor

- Ultrasonic distance sensors Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

ULTRASONIC DISTANCE SENSORS

Part description Part No.:	Meas. range [mm] <input type="checkbox"/>	Ultrasonic frequency	Opening angle	Output	Connection
Ultrasonic distance sensors					
VRTU 430 M/V - 5710 - 300 - S12 50036266	<input type="checkbox"/> 60 ... 300 ¹⁾	400kHz	6°	Analog/mA PNP	M12 connector
VRTU 430 M/V - 5510 - 300 - S12 50040771	<input type="checkbox"/> 60 ... 300 ¹⁾	400kHz	6°	Analog/V PNP	M12 connector
VRTU 430 M/V - 3710 - 1300 - S12 50036267	<input type="checkbox"/> 200 ... 1300 ¹⁾	200kHz	6°	Analog/mA PNP	M12 connector
VRTU 430 M/V - 3510 - 1300 - S12 50040772	<input type="checkbox"/> 200 ... 1300 ¹⁾	200kHz	6°	Analog/V PNP	M12 connector
VRTU 430 M/V - 2710 - 3000 - S12 50036268	<input type="checkbox"/> 400 ... 3000 ²⁾	120kHz	6°	Analog/mA PNP	M12 connector
VRTU 430 M/V - 2510 - 3000 - S12 50107096	<input type="checkbox"/> 400 ... 3000 ²⁾	120kHz	6°	Analog/V PNP	M12 connector
VRTU 430 M/V - 1710 - 6000 - S12 50036269	<input type="checkbox"/> 600 ... 6000 ³⁾	80kHz	6°	Analog/mA PNP	M12 connector

- 1) Over complete temperature range, measurement object $\geq 10 \times 10 \text{mm}^2$
 2) Over complete temperature range, measurement object $\geq 50 \times 50 \text{mm}^2$
 3) Over complete temperature range, measurement object $\geq 100 \times 100 \text{mm}^2$
 4) Of the measurement range end value

We reserve the right to make changes • VRTU430_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC
f 50036559	PGU 01	Programming unit incl. software

ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

VRTU 430
Ultrasonic sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

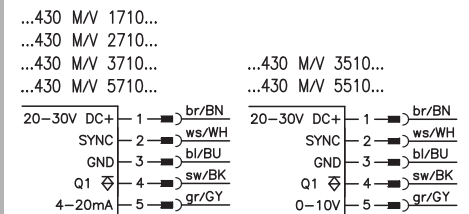
Abs. meas. accuracy ⁴⁾	Repeatability	Resolution [mm]	Option	Accessories
± 1.5%	± 0.45mm	≤ 1	1, 2, 3, 4	a, b, c, d, e, f
± 1.5%	± 0.45mm	≤ 1	1, 2, 3, 4	a, b, c, d, e, f
± 1.5%	± 2mm	≥ 1	1, 2, 3, 4	a, b, c, d, e, f
± 1.5%	± 2mm	≥ 1	1, 2, 3, 4	a, b, c, d, e, f
± 1.5%	± 5mm	≥ 1	1, 2, 3, 4	a, b, c, d, e, f
± 1.5%	± 5mm	≥ 1	1, 2, 3, 4	a, b, c, d, e, f
± 1.5%	± 9mm	≥ 1	1, 2, 3, 4	a, b, c, d, e, f



Optical Sensor

- Ultrasonic distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection




Options

- 1 Configurable via programming unit and software
- 2 Sensor synchronization via SYNC input
- 3 Configurable multiplex operation
- 4 UL approval

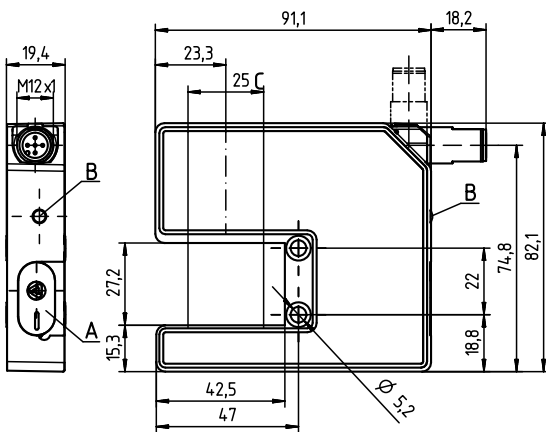
OVERVIEW OF MEASURING CCD FORKED SENSORS

Dimensioned drawing

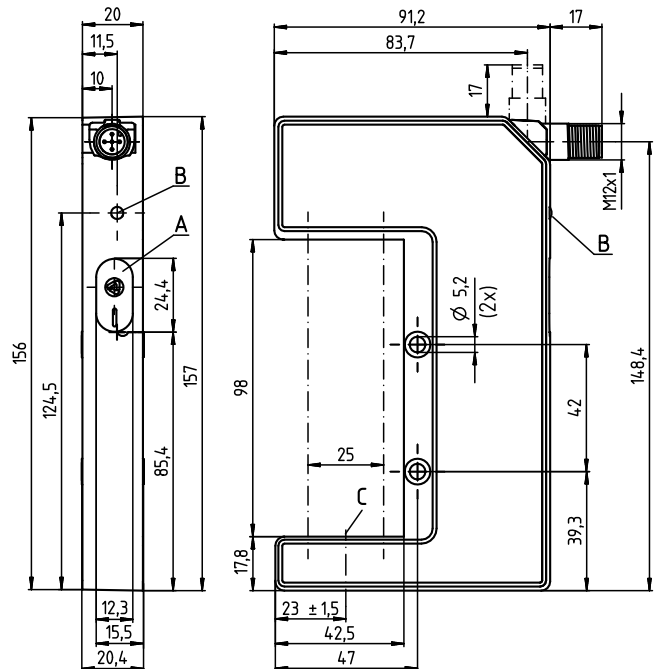
- A** Interface
- B** Indicator diode
- C** Optical detection area

 Further details can be found in the respective data sheet.












GS 754B/...-27-...




GS 754B/...-98-...



We reserve the right to make changes • GS754_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

GS 754B

Measuring CCD forked sensors	Mouth width	Page
 Measuring CCD forked sensors GS 754B	27 / 98mm	312

Additional products - forked sensors:

 Optical forked sensors	GS 04, GS 06, GS 21	428
 Capacitive forked sensors	GK 14	446
 Ultrasonic forked sensors	GSU 06, GSU 14C	450



Common technical data

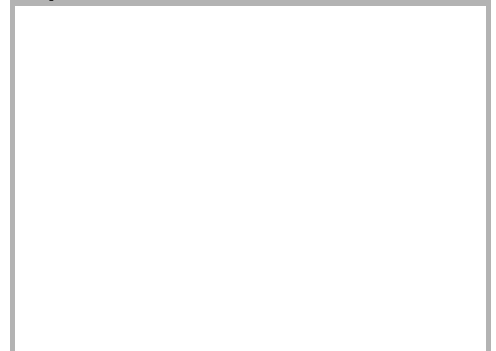
Electrical data	Operating voltage U_B	10/18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 60\text{mA}$
	Signal voltage high/low	$\geq 8\text{V}/\leq 2\text{V}$
Measurement data	Measurement field length	25 mm
	Measurement cycle	$\geq 12\text{ms}$
	Maximum resolution	$\geq 14\mu\text{m}$
Indicators	Green LED	Ready to operate
	Flashing green LED	Interference
Mechanical data	Housing	Diecast zinc
	Optics cover	Plastic
	Weight	270g/290g
Environmental data	Ambient temperature	$-20^\circ\text{C} \dots +50^\circ\text{C}$ (operation)
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2

Features

- Edge and object detection of up to 3 objects in 25mm wide light band
- Resolution 14 μm
- Adjustable measurement range and measurement mode
- Teach-in function, switching or warning output
- Detection of multiple objects
- Detection of transparent media
- Turning connector



Optical Sensor



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

MEASURING CCD FORKED SENSORS

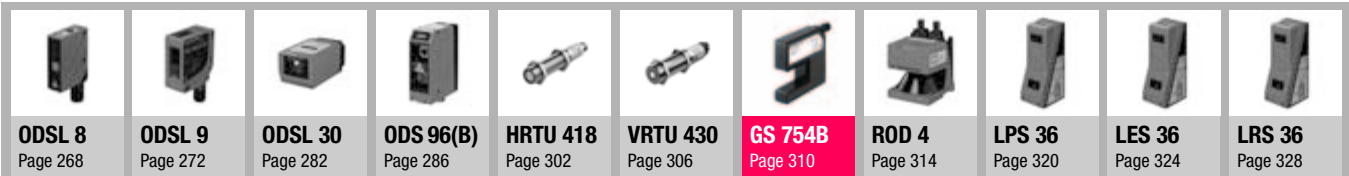
Part description Part No.:	Mouth width [mm]	Operating voltage	Light source	Output
Measuring CCD forked sensors				
GS 754B/C4 - 98 - S12 50119712	98	18 ... 30VDC	Infrared light	Analog/mA I/O configurable
GS 754B/V4 - 98 - S12 50117818	98	18 ... 30VDC	Infrared light	Analog/V I/O configurable
GS 754B/D24 - 98 - S12 50119710	98	10 ... 30VDC	Infrared light	Serial/RS 232 I/O configurable
GS 754B/D3 - 98 - S12 50119711	98	10 ... 30VDC	Infrared light	Serial / RS 422
GS 754B/C4 - 27 - S12 50115803	27	18 ... 30VDC	Infrared light	Analog/mA I/O configurable
GS 754B/V4 - 27 - S12 50115809	27	18 ... 30VDC	Infrared light	Analog/V I/O configurable
GS 754B/D24 - 27 - S12 50115807	27	10 ... 30VDC	Infrared light	Serial/RS 232 I/O configurable
GS 754B/D3 - 27 - S12 50115806	27	10 ... 30VDC	Infrared light	Serial / RS 422

We reserve the right to make changes • GS754_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50082007	KB - ODS 96 - 1500	Configuration cable to PC, 1500mm



GS 754(B)
 CCD forked sensors



Photoel. sensors/
 light scanners,
 cubic housing

Photoel. sensors/
 light scanners,
 cylindrical housing

Measuring
 Sensors

Ultrasonic
 Sensors

Inductive
 Switches

Forked
 Sensors

Special
 Sensors

Fiber Optic
 Sensors

Light
 Curtains

Protective
 Sensors

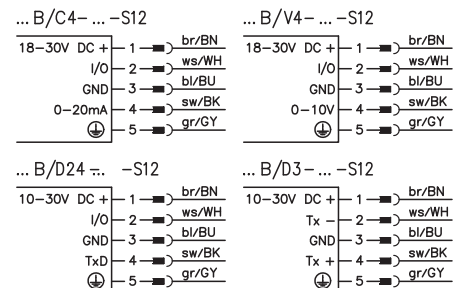
Connection	Option	Accessories
M12 connector, 5-pin	1, 2, 3	a, b, c, d, e
M12 connector, 5-pin	1, 2, 3	a, b, c, d, e
M12 connector, 5-pin	1, 2, 3	a, b, c, d, e
M12 connector, 5-pin	1	a, b, c, d, e
M12 connector, 5-pin	1, 2, 3	a, b, c, d, e
M12 connector, 5-pin	1, 2, 3	a, b, c, d, e
M12 connector, 5-pin	1, 2, 3	a, b, c, d, e
M12 connector, 5-pin	1	a, b, c, d, e



Optical Sensor

- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Adjustable measurement range and measurement mode
- 2 I/O (pin 2) configurable as teach input or switching output
- 3 Teach-in via teach input

OVERVIEW OF SURFACE DISTANCE SENSORS



Compartment occupancy monitoring



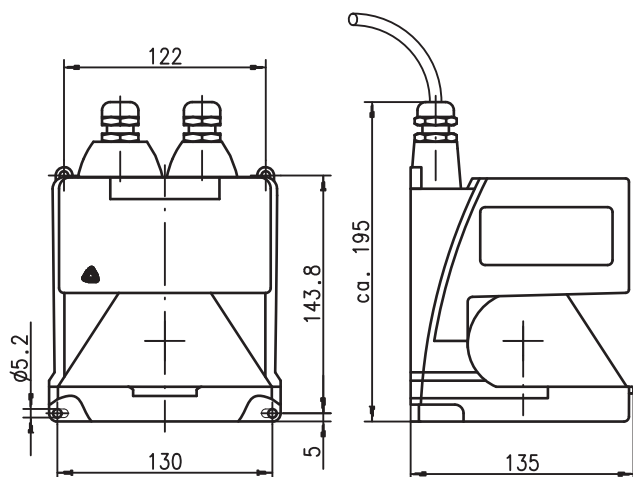
Object measurement



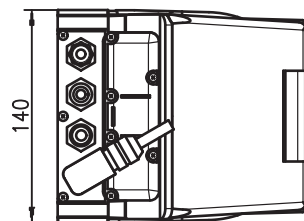
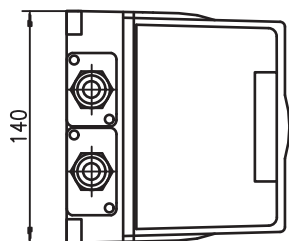
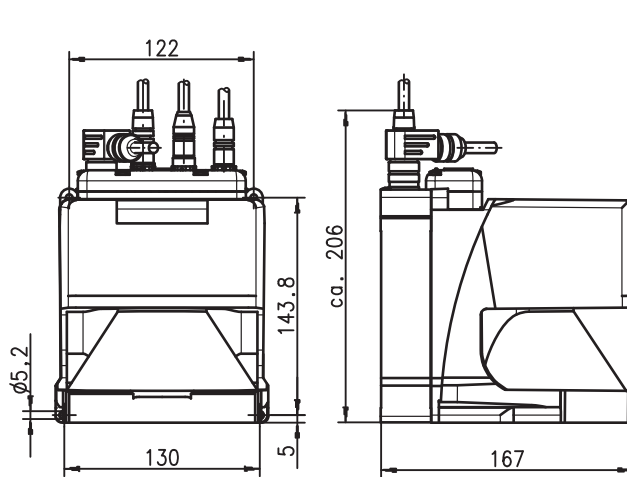
Position measurement

Dimensioned drawing

ROD 4 - 3...














ROD 4...plus




Further details can be found in the respective data sheet.

We reserve the right to make changes • ROD4_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

ROD 4 / ROD 4 plus





Surface distance sensors	Measurement range	Page
 Surface distance sensors ROD 4	0 ... 65m	316



Common technical data		
Electrical data	Operating voltage U_B	+24VDC +20%/-30%
	Current consumption	Approx. 400mA
		Heating: approx. 2A
Measurement data	Detection range	190°
	Angular resolution	0.36°
	Measurement time	20ms/scan (ROD4-5xplus) 40ms/scan (ROD4plus)
Mechanical data	Housing	Aluminum/Plastic
	Optics cover	Plastic
	Weight	ROD4...: 2000g ROD4...plus: 2200g
Environmental data	Ambient temperature (operation)	0°C ... +50°C
		Heating: -20°C ... +50°C
	VDE safety class	III
	Protection class	IP 65
	Standards applied	IEC 60947-5-2, UL 508
Mounting systems for this series can be found from page 644 onwards		

Features

- Area scanning distance sensor for object detection and object measurement
- Detection fields up to 50m
- 8 detection field pairs
- Config-Plug for device exchange without PC
- Fast Ethernet: ROD 4 plus
- Laser class 1

Optical Sensor	
● Optical distance sensors	Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OPTICAL SURFACE DISTANCE SENSORS

Part description Part No.:	Meas. range [m] <input type="checkbox"/>	Operating voltage	Light source	Output
Optical surface distance sensors				
ROD 4 - 30 50110238	<input type="text" value="0"/> <input type="text" value="65"/>	24VDC	Infrared laser class 1	Serial/RS 232/RS 422 4 x PNP
ROD 4 - 36 50110666	<input type="text" value="0"/> <input type="text" value="65"/>	24VDC	Infrared laser class 1	Serial/RS 232/RS 422 4 x PNP
ROD 4 - 38 50110667	<input type="text" value="0"/> <input type="text" value="25"/>	24VDC	Infrared laser class 1	Serial/RS 232/RS 422 4 x PNP



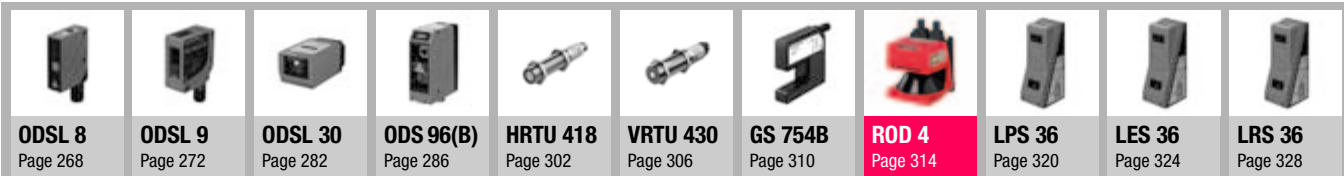
Configuration software RODsoft, RODplussoft - free download at www.leuze.com.

We reserve the right to make changes • ROD4_EN.frm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50108138	KB - ROD 4 - CP - 5000	Connection cable 5000mm, with configuration memory
b 50108139	KB - ROD 4 - CP - 10000	Connection cable 10000mm, with configuration memory
c 50038069	KB - ROD 4 PC - 3000	Configuration cable to PC, 3000mm
d 50038070	KB - ROD 4 PC - 10000	Configuration cable to PC, 10000mm
e 50038072	KD - ROD4 - X1 - Set	Connector X1 for ROD 4, 15-pin
f 50038073	KD - ROD4 - X2 - Set	Connector X2 for ROD 4, 9-pin
g 50038066	ROD 4 - MS	Mounting system for ROD 4...



ROD 4

Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

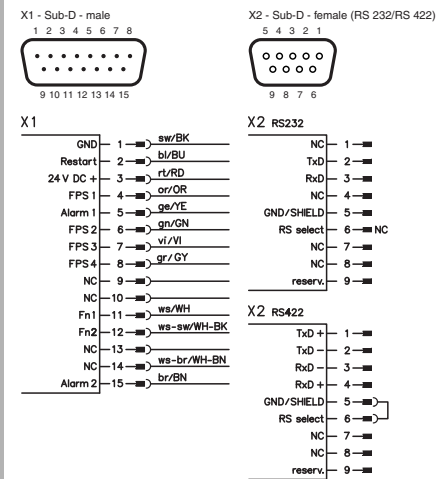
Connection	Option	Accessories
1 SUB-D, 15-pin 1 SUB-D, 9-pin	1, 2, 3, 6	a, b, c, d, e
1 SUB-D, 15-pin 1 SUB-D, 9-pin	1, 2, 3, 4, 6	a, b, c, d, e
1 SUB-D, 15-pin 1 SUB-D, 9-pin	1, 2, 3, 4, 5, 6	a, b, c, d, e



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 8 detection field pairs
- 2 Warning and alarm output
- 3 Restart-disable
- 4 Internal heating
- 5 Dust-insensitive version
- 6 UL approval (class 2 acc. to NEC)

OPTICAL SURFACE DISTANCE SENSORS

Part description Part No.:	Meas. range [m] <input type="checkbox"/>	Operating voltage	Light source	Output
Optical surface distance sensors				
ROD 4 plus 50106481	<input type="text" value="0"/> <input type="text" value="65"/>	24VDC	Infrared laser class 1	Ethernet Serial/RS 232/RS 422 4 x PNP
ROD 4 - 08 plus 50106480	<input type="text" value="0"/> <input type="text" value="25"/>	24VDC	Infrared laser class 1	Ethernet Serial/RS 232/RS 422 4 x PNP
ROD 4 - 50 plus 50113226	<input type="text" value="0"/> <input type="text" value="65"/>	24VDC	Infrared laser class 1	Ethernet Serial/RS 232/RS 422 4 x PNP
ROD 4 - 58 plus 50113225	<input type="text" value="0"/> <input type="text" value="25"/>	24VDC	Infrared laser class 1	Ethernet Serial/RS 232/RS 422 4 x PNP



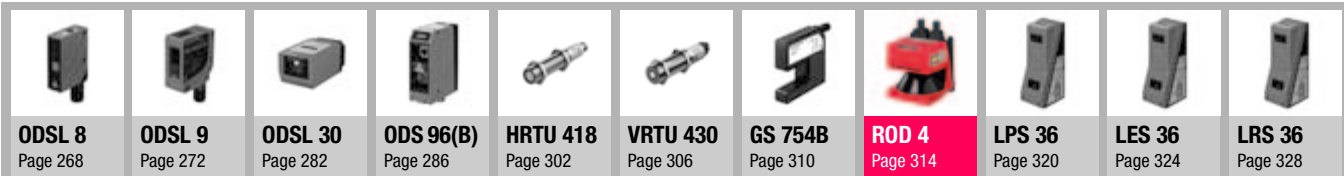
Configuration software RODsoft, RODplussoft - free download at www.leuze.com.

We reserve the right to make changes • ROD4plus_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50106976	KB - 014S - 5000 - 14	Connection cable, single-sided M16 socket, 14-pin, angular, 5m
b 50109881	KB ET - 5000 - SA - RJ45	Ethernet cable, axial M12 connector - RJ 45 plug, 5m
c 50106881	KB - ROD 4plus - 5000	Configuration cable, M12 connector - 9 pin Sub-D socket, 5m
d 50106906	KB - ROD 4plus - 10000	Configuration cable, M12 connector - 9 pin Sub-D socket, 10m
e 50104590	K-D - M12A - 8P - 5m - PUR	RS 232/422 connection cable, single-sided M12 socket, 8-pin, axial, 5m
f 50038066	ROD 4 - MS	Mounting system for ROD 4...



ROD 4 plus
Optical distance sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

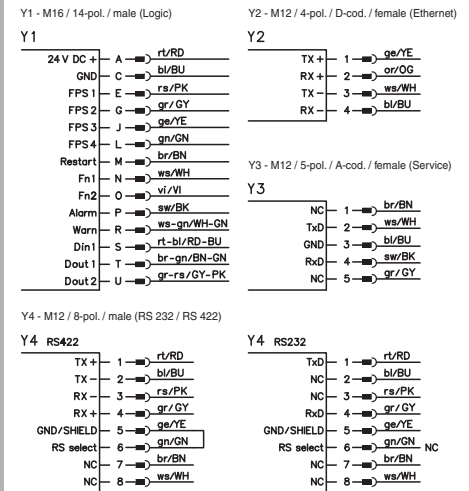
Connection	Option	Accessories
1 M16, 14-pin 3 M12, 4/5/8-pin	1, 2, 3, 4, 8	a, b, c, d, e, f
1 M16, 14-pin 3 M12, 4/5/8-pin	1, 2, 3, 4, 6, 7, 8	a, b, c, d, e, f
1 M16, 14-pin 3 M12, 4/5/8-pin	2, 3, 5, 8	a, b, c, d, e, f
1 M16, 14-pin 3 M12, 4/5/8-pin	2, 3, 5, 6, 7, 8	a, b, c, d, e, f



Optical Sensor

- Optical distance sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



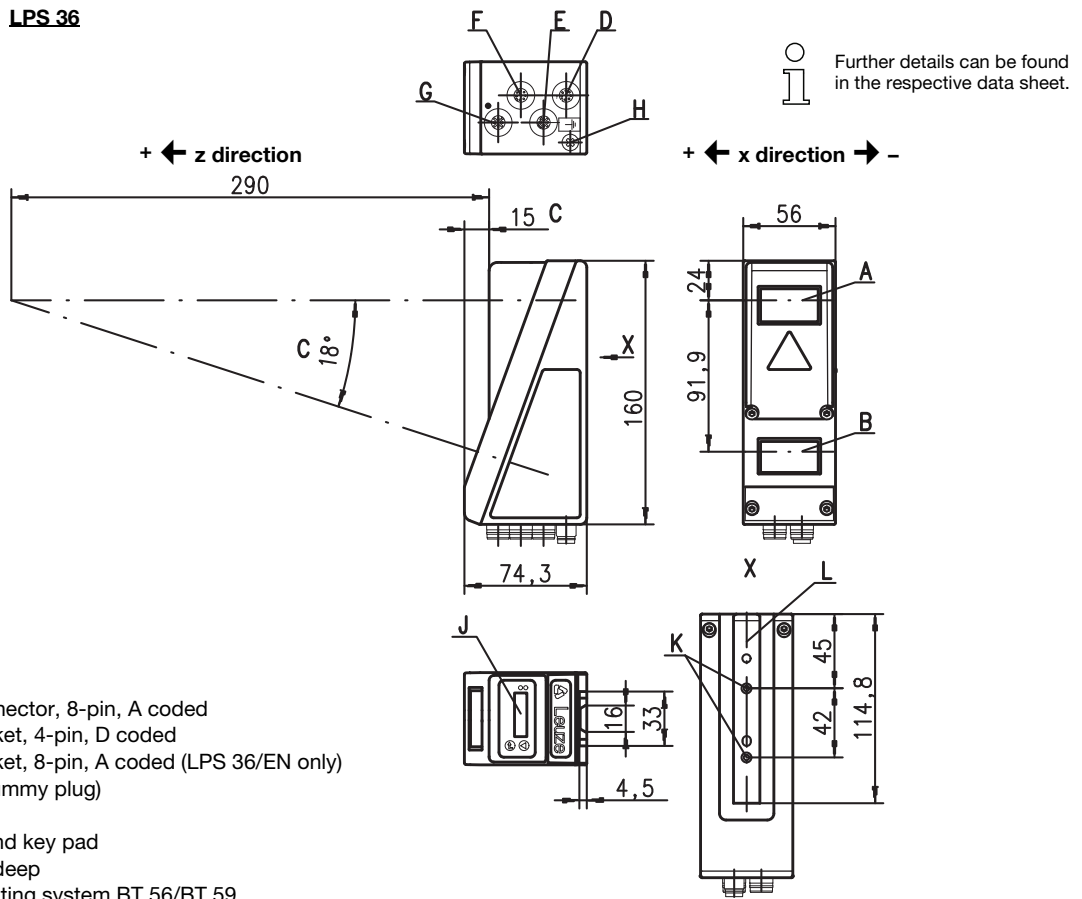
Options

- 8 detection field pairs
- Warning and alarm output
- Restart-disable
- Scanning rate 25Hz / measurement time 40ms/scan, for object detection and object measurement
- Scanning rate 50Hz / measurement time 20ms/scan, for object measurement
- Internal heating
- Dust-insensitive version
- UL approval (class 2 acc. to NEC)












OVERVIEW OF LINE PROFILE SENSORS

Dimensioned drawing



LPS 36



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ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

LPS 36

Light section sensors	Measurement range	Page
 Line Profile Sensors LPS 36	200 ... 800mm	322
 Line Profile Sensors LPS 36 HI	200 ... 600mm	322



Common technical data		
Electrical data	Operating voltage U_B	18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	≤ 200 mA
	Switching outputs	2x24V/100mA/push-pull
	Switching inputs	2x24V, Trigger+Enable
	Ethernet interface	UDP
Indicators	Green LED	Ready to operate
	Yellow LED	Ethernet
Mechanical data	Housing	Aluminum/Plastic
	Optics cover	Glass
	Weight	Approx. 620g
Environmental data	Ambient temperature (operation)	-30°C ... +50°C
	VDE safety class	III, PELV
	Protection class	IP 67
	Laser class	2M acc. to EN 60825-1
	Standards applied	IEC 60947-5-2, UL 508

Features

- Light section sensor for object measurement
- Calibrated system
- Length of laser line: 150 ... 600mm
- High resolution versions (HI) with laser line 60 ... 170mm
- Measurement data transfer via Fast Ethernet (UDP)
- Measurement value display in mm on OLED display as alignment aid



Optical Sensor

- Light section sensors Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

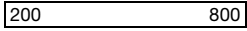


Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

LIGHT SECTION SENSORS

Part description Part No.:	Meas. range [mm] ¹⁾ <input type="checkbox"/>	Operating voltage	Light source	Output	Connection	Meas. time [ms]
Line Profile Sensors						
LPS 36 50111325		18 ... 30VDC	Red light Laser class 2M	Ethernet 2 x push-pull	M12 connector	10
LPS 36/EN 50111324		18 ... 30VDC	Red light Laser class 2M	Ethernet 2 x push-pull	M12 connector	10
LPS 36HI/EN 50111334		18 ... 30VDC	Red light Laser class 2M	Ethernet 2 x push-pull	M12 connector	10

1) Luminosity coefficient 6 ... 90%, entire measurement range, at 20°C after 30minutes warm-up time, medium range U_B.
 2) In z direction, luminosity coefficient 90%, same object, identical environmental conditions, measurement object ≥ 50x50mm²

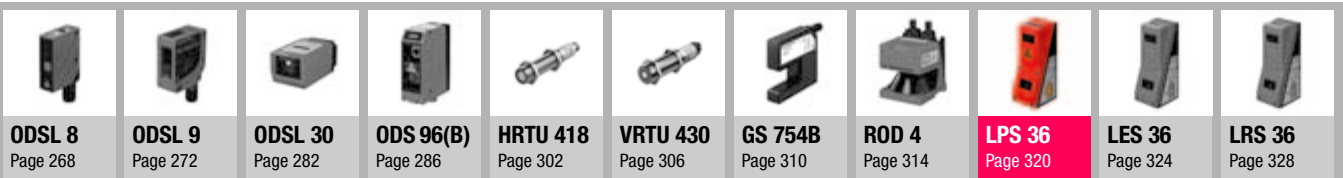


Configuration software LPSsoft - free download at www.leuze.com.

We reserve the right to make changes • LPS36_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50109881	KB ET - 5000 - SA - RJ45	Ethernet cable, axial M12 connector - RJ 45 plug, 5m, for X2
b 50104590	K - D M12A - 8P - 5m - PUR	Connection cable 5000mm, axial M12 socket, 8-pin, for X1
c 50110180	KB M12/8 - 5000 - SA	Connection cable 5000mm, axial M12 connector, 8-pin, for X3
d 50027375	BT 56	Fixing component with dovetail for rod
e 50111224	BT 59	Fixing component with dovetail for ITEM profile



LPS 36
Line Profile Sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Linearity	Repeatability	Resolution	Option	Accessories
$\leq \pm 1\% ^2$	$\leq 0,5\% ^2$	1 ... 1.5mm ³⁾ 1 ... 3mm ⁴⁾	1, 2, 3, 5	a, b, c, d, e
$\leq \pm 1\% ^2$	$\leq 0,5\% ^2$	1 ... 1.5mm ³⁾ 1 ... 3mm ⁴⁾	1, 2, 3, 4, 5	a, b, c, d, e
$\leq \pm 0.5\% ^2$	$\leq 0,25\% ^2$	0.2 ... 0.6mm ³⁾ 0.1 ... 0.9mm ⁴⁾	1, 2, 3, 4	a, b, c, d, e

3) In x direction, minimum and maximum value depend on measurement distance
4) In z direction, minimum and maximum value depend on measurement distance



Optical Sensor

- Light section sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

X1			X2		
M12x1, 8-pole, male, A-cod.			M12x1, 4-pole, female, D-cod.		
PIN	Signal	Color	PIN	Signal	Color
1	+24 V DC	WH	1	Tx+	YE
2	In1	BR	2	Rx+	WH
3	GND	GN	3	Tx-	OR
4	Out1	YE	4	Rx-	BU
5	In2	GY			
6	Out2	PK			
7	RS 232 - Tx	BU			
8	RS 232 - Rx	RD			

X3			X4		
M12x1, 8-pole, female, A-cod.			-		
PIN	Signal	Color	PIN	Signal	Color
1	Enc. +24 V DC	WH			
2	(GND)	BR			
3	GND	GN			
4	Enc. A+	YE			
5	Enc. A-	GY			
6	Enc. B+	PK			
7	Enc. B-	BU			
8	+5 V DC Out	RD			

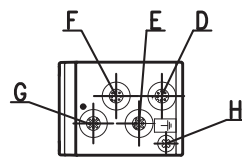
Options

- 1 Configuration via OLED display and control buttons or via PC
- 2 Trigger and activation input
- 3 Cascading of up to 9 sensors
- 4 Connection for incremental transmitter (encoder)
- 5 UL approval (class 2 acc. to NEC)

OVERVIEW OF LINE EDGE SENSORS

Dimensioned drawing

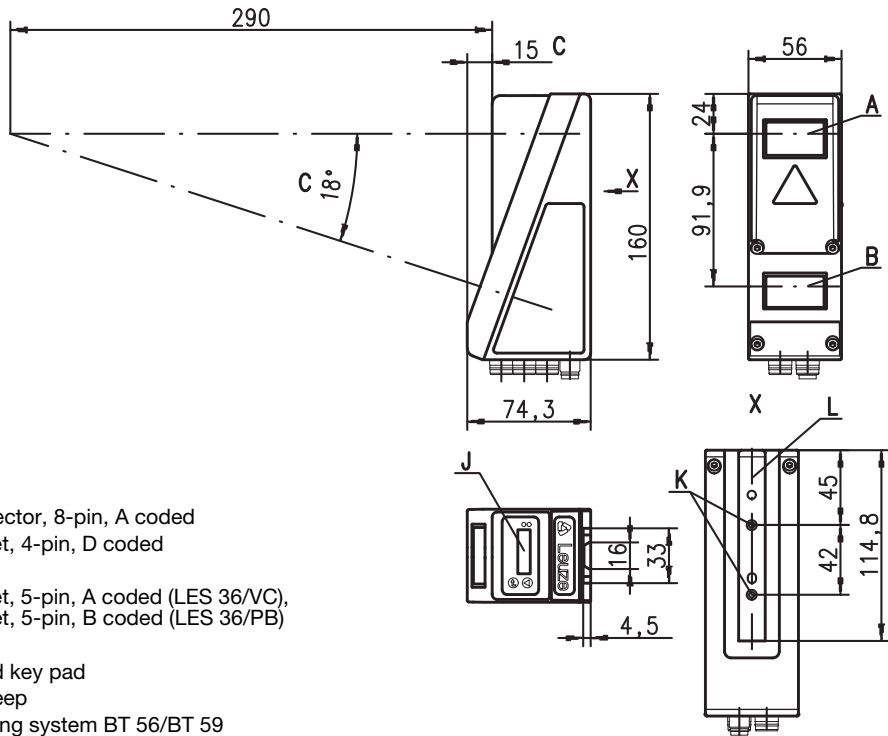
LES 36



Further details can be found in the respective data sheet.












+ ← z direction

+ ← x direction → -




- A** Transmitter
- B** Receiver
- C** Optical axis
- D** X1: M12x1 connector, 8-pin, A coded
- E** X2: M12x1 socket, 4-pin, D coded
- F** X3: cap
- G** X4: M12x1 socket, 5-pin, A coded (LES 36/VC), M12x1 socket, 5-pin, B coded (LES 36/PB)
- H** PE screw
- J** OLED display and key pad
- K** M4 thread, 4.5 deep
- L** Holder for mounting system BT 56/BT 59

We reserve the right to make changes • LES36_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

LES 36

Light section sensors	Measurement range	Page
 Line Edge Sensors LES 36	200 ... 800mm	326



Common technical data		
Electrical data	Operating voltage U_B	18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	≤ 200 mA
	Switching outputs	2x24V/100mA/push-pull
	Switching inputs	2x24V, Trigger/Enable, selection of the inspection
	Ethernet interface	UDP
	PROFIBUS interface	DP V1 slave (optional)
Indicators	Green LED	Ready to operate
	Yellow LED	Ethernet
Mechanical data	Housing	Aluminum/Plastic
	Optics cover	Glass
	Weight	Approx. 620g
Environmental data	Ambient temperature (operation)	-30°C ... +50°C
	VDE safety class	III, PELV
	Protection class	IP 67
	Laser class	2M acc. to EN 60825-1
	Standards applied	IEC 60947-5-2, UL 508

Features

- **Light section sensor for object measurement (width, height, position measurement)**
- **Up to 8 analysis windows with logical linking option**
- **Up to 16 inspection tasks**
- **Length of laser line: 150 ... 600mm**
- **Measurement value display in mm on OLED display as alignment aid**
- **Laser class 2M**



Optical Sensor

- Light section sensors Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

LIGHT SECTION SENSORS

Part description Part No.:	Meas. range [mm] ¹⁾ <input type="checkbox"/>	Operating voltage	Light source	Output	Connection
Line Edge Sensors					
LES 36/VC 50111326	200 <input type="checkbox"/> 800	18 ... 30VDC	Red light Laser class 2M	Ethernet, 2 x analog	M12 connector
LES 36/PB 50111327	200 <input type="checkbox"/> 800	18 ... 30VDC	Red light Laser class 2M	Ethernet, PROFIBUS DP	M12 connector

1) Luminosity coefficient 6 ... 90 %, entire measurement range, at 20°C after 30minutes warm-up time, medium range U_B.
 2) In z direction, luminosity coefficient 90 %, same object, identical environmental conditions, measurement object ≥ 50x50mm²








LESsoft configuration software - free download at www.leuze.com.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50109881	KB ET - 5000 - SA - RJ45	Ethernet cable, axial M12 connector - RJ 45 plug, 5m, for X2
b 50104590	K - D M12A - 8P - 5m - PUR	Connection cable 5000mm, axial M12 socket, 8-pin, for X1
c 50102969	KB 008 - 5000 - A - S	Connection cable 5000mm, axial M12 connector, 5-pin, for X4
d 50104180	KB PB - 5000 - BA	PROFIBUS connection cable 5000mm, axial M12 socket
e 50104187	KB PB - 5000 - SA	PROFIBUS connection cable 5000mm, axial M12 plug
f 50109834	KDS BUS OUT M12-T-5P	PROFIBUS M12 T-connector, for X4
g 50038539	TS 02-4-SA M12	M12 connector with integrated BUS terminating resistor
h 50027375	BT 56	Fixing component with dovetail for rod
j 50111224	BT 59	Fixing component with dovetail for ITEM profile

We reserve the right to make changes • LES36_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

LES 36
Line Edge Sensors



Linearity	Repeatability	Resolution	Option	Accessories
$\leq \pm 1\% ^2)$	$\leq 0,5\% ^2)$	1 ... 1.7mm ³⁾ 1 ... 3mm ⁴⁾	1, 2, 3, 5, 6, 8	a, b, c, d, e, h, j
$\leq \pm 1\% ^2)$	$\leq 0,5\% ^2)$	1 ... 1.7mm ³⁾ 1 ... 3mm ⁴⁾	1, 2, 3, 4, 5, 7, 8	a, b, c, d, e, f, g, h, j

3) In x direction, minimum and maximum value depend on measurement distance
4) In z direction, minimum and maximum value depend on measurement distance



Optical Sensor

- Light section sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

X1			X2		
M12x1, 8-pole, male, A-cod.			M12x1, 4-pole, female, D-cod.		
PIN	Signal	Color	PIN	Signal	Color
1	+24 V DC	WH	1	Tx+	YE
2	In1	BR	2	Rx+	WH
3	GND	GN	3	Tx-	OR
4	Out1	YE	4	Rx-	BU
5	In2	GY			
6	Out2	PK			
7	reserved	BU			
8	reserved	RD			

X4 (LES 36/VC... only)			X4 (LES 36/PB... only)		
M12x1, 5-pole, female, A-cod.			M12x1, 5-pole, female, B-cod.		
PIN	Signal	Color	PIN	Signal	Color
1	not connected	BR	1	VP	
2	4-20mA	WH	2	A	GN
3	AGND	BU	3	DGND	
4	1-10V	BK	4	B	RD
5	FE	GY	5	FE	

Options

- 1 Configuration via OLED display and control buttons or via PC
- 2 Trigger and activation input
- 3 Cascading of up to 9 sensors
- 4 Up to 8 analysis windows with logical linking option
- 5 Up to 16 inspection tasks
- 6 Analog current and voltage output
- 7 PROFIBUS DP interface
- 8 UL approval (class 2 acc. to NEC)

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

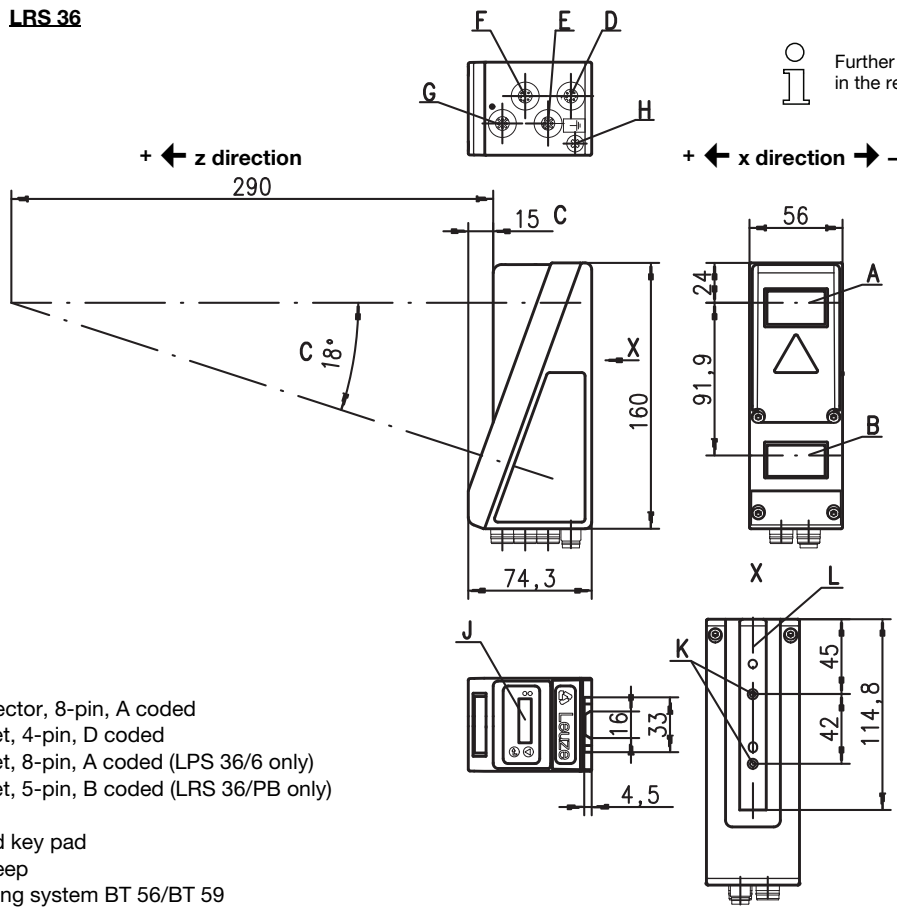
Light
Curtains

Protective
Sensors

OVERVIEW OF LINE RANGE SENSORS

Dimensioned drawing












LRS 36




Further details can be found in the respective data sheet.

- A** Transmitter
- B** Receiver
- C** Optical axis
- D** X1: M12x1 connector, 8-pin, A coded
- E** X2: M12x1 socket, 4-pin, D coded
- F** X3: M12x1 socket, 8-pin, A coded (LRS 36/6 only)
- G** X4: M12x1 socket, 5-pin, B coded (LRS 36/PB only)
- H** PE screw
- J** OLED display and key pad
- K** M4 thread, 4.5 deep
- L** Holder for mounting system BT 56/BT 59

We reserve the right to make changes • LRS36_Overview_EN.fm

										
ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

LRS 36

Light section sensors	Scanning range	Page
 Line Range Sensors LRS 36	200 ... 800mm	330



Common technical data		
Electrical data	Operating voltage U_B	18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	≤ 200 mA
	Switching outputs	2(6)x24V/100mA/push-pull
	Switching inputs	2x24V, Trigger/Enable, selection of the inspection
	Ethernet interface	UDP
	PROFIBUS interface	DP V1 slave (optional)
Indicators	Green LED	Ready to operate
	Yellow LED	Ethernet
Mechanical data	Housing	Aluminum/Plastic
	Optics cover	Glass/Plastic
	Weight	Approx. 620g
Environmental data	Ambient temperature (operation)	-30°C ... +50°C
	VDE safety class	III, PELV
	Protection class	IP 67
	Laser class	2M acc. to EN 60825-1
	Standards applied	IEC 60947-5-2, UL 508

Features

- Light section sensor for object detection
- Up to 16 detection fields with logical linking option
- Up to 16 inspection tasks
- Length of laser line: 150 ... 600mm
- Measurement value display in mm on OLED display as alignment aid
- Laser class 2M



Optical Sensor

- Light section sensors Page 691

Photoel. sensors/
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light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

LIGHT SECTION SENSORS

Part description Part No.:	Scanning range [mm] ¹⁾ <input type="checkbox"/>	Operating voltage	Light source	Output	Connection
Line Range Sensors					
LRS 36/6 50111330	<input type="checkbox"/> 200 <input type="checkbox"/> 800	18 ... 30VDC	Red light Laser class 2M	Ethernet, 6 x push-pull ²⁾	M12 connector
LRS 36/6.10 50115418	<input type="checkbox"/> 200 <input type="checkbox"/> 800	18 ... 30VDC	Red light Laser class 2M	Ethernet, 6 x push-pull ²⁾	M12 connector
LRS 36/PB 50111332	<input type="checkbox"/> 200 <input type="checkbox"/> 800	18 ... 30VDC	Red light Laser class 2M	Ethernet, PROFIBUS DP	M12 connector

1) Luminosity coefficient 6 ... 90%, entire detection range, at 20°C after 30minutes warm-up time, medium range U_B.

2) Number of detection fields: up to 16 with logical linking option; number of inspection tasks: up to 16, of which 8 can be activated via inputs














Configuration software LRSsoft - free download at www.leuze.com.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50109881	KB ET - 5000 - SA - RJ45	Ethernet cable, axial M12 connector - RJ 45 plug, 5m, for X2
b 50104590	K - D M12A - 8P - 5m - PUR	Connection cable 5000mm, axial M12 socket, 8-pin, for X1
c 50110180	KB M12/8 - 5000 - SA	Connection cable 5000mm, axial M12 connector, 8-pin, for X3
d 50104180	KB PB - 5000 - BA	PROFIBUS connection cable 5000mm, axial M12 socket
e 50104187	KB PB - 5000 - SA	PROFIBUS connection cable 5000mm, axial M12 plug
f 50109834	KDS BUS OUT M12-T-5P	PROFIBUS M12 T-connector, for X4
g 50038539	TS 02-4-SA M12	M12 connector with integrated BUS terminating resistor
h 50027375	BT 56	Fixing component with dovetail for rod
j 50111224	BT 59	Fixing component with dovetail for ITEM profile

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ODSL 8 Page 268	ODSL 9 Page 272	ODSL 30 Page 282	ODS 96(B) Page 286	HRTU 418 Page 302	VRTU 430 Page 306	GS 754B Page 310	ROD 4 Page 314	LPS 36 Page 320	LES 36 Page 324	LRS 36 Page 328

LRS 36

Line Range Sensors



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cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

	Response time [ms]	Minimum object size	Option	Accessories
	10	2 ... 3 mm ³⁾ 2 ... 6 mm ⁴⁾	1, 2, 3, 4, 5, 8	a, b, c, h, j
	10	2 ... 3 mm ³⁾ 2 ... 6 mm ⁴⁾	1, 2, 3, 4, 5, 6, 8	a, b, c, h, j
	10	2 ... 3 mm ³⁾ 2 ... 6 mm ⁴⁾	1, 2, 3, 4, 5, 7, 8	a, b, c, d, e, f, g, h, j

3) In x direction, minimum and maximum value depend on measurement distance
4) In z direction, minimum and maximum value depend on measurement distance



Optical Sensor

- Light section sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection






X1			X2		
M12x1, 8-pole, male, A-cod.			M12x1, 4-pole, female, D-cod.		
PIN	Signal	Color	PIN	Signal	Color
1	+24 V DC	WH	1	Tx+	YE
2	In1	BR	2	Rx+	WH
3	GND	GN	3	Tx-	OR
4	Out1	YE	4	Rx-	BU
5	In2	GY			
6	Out2	PK			
7	reserved	BU			
8	reserved	RD			

X3 (LRS 36/6... only)			X4 (LRS 36/PB... only)		
M12x1, 8-pole, female, A-cod.			M12x1, 5-pole, female, B-cod.		
PIN	Signal	Color	PIN	Signal	Color
1	Out6	WH	1	VP	
2	Out5	BR	2	A	GN
3	GND	GN	3	DGND	
4	Out4	YE	4	B	RD
5	Out3	GY	5	FE	
6	InSel3	PK			
7	InSel2	BU			
8	InSel1	RD			

Options

- 1 Configuration via OLED display and control buttons or via PC
- 2 Trigger and activation input
- 3 Cascading of up to 9 sensors
- 4 Up to 16 detection fields with logical linking option
- 5 Up to 16 inspection tasks, of which 8 can be activated via inputs
- 6 With scratch resistant coated plastic screen instead of glass pane
- 7 PROFIBUS DP interface
- 8 UL approval (class 2 acc. to NEC)

SELECTION TABLE

Series	Dimensions in mm (WxHxD) in mm (ØxL)	Housing material		Typ. operating range/scanning range [mm]			
		Plastic	Metal	100	500	1000	6000
 420	20 x 42 x 15	●		10 ————— 1000			
 18	15 x 50 x 33		●	0 ————— 650			
 412	M12 x 70		●	10 ————— 400			
 418	M18 x 50 M18 x 70 M18 x 90		●	25 ————— 700			
 430	M30 x 131 48 x 150		●	60 ————— 6000			

ULTRASONIC SENSORS 

	Operating principle			Operating voltage			Output		Input		Connection		Page
	Ultrasonic throughbeam sensor	Ultrasonic retro-reflective sensor	Ultrasonic scanners	10 ... 30VDC	12 ... 30VDC	20 ... 30VDC	PNP switching outputs	NPN switching outputs	Teach input	Synchronization input	M8 connector	M12 connector	
			●		●		●	●	●		●		338
	●			●			●	●				●	334
			●		●		●	●	●			●	344
			●			●	●		●			●	348
			●			●	●			●		●	354

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

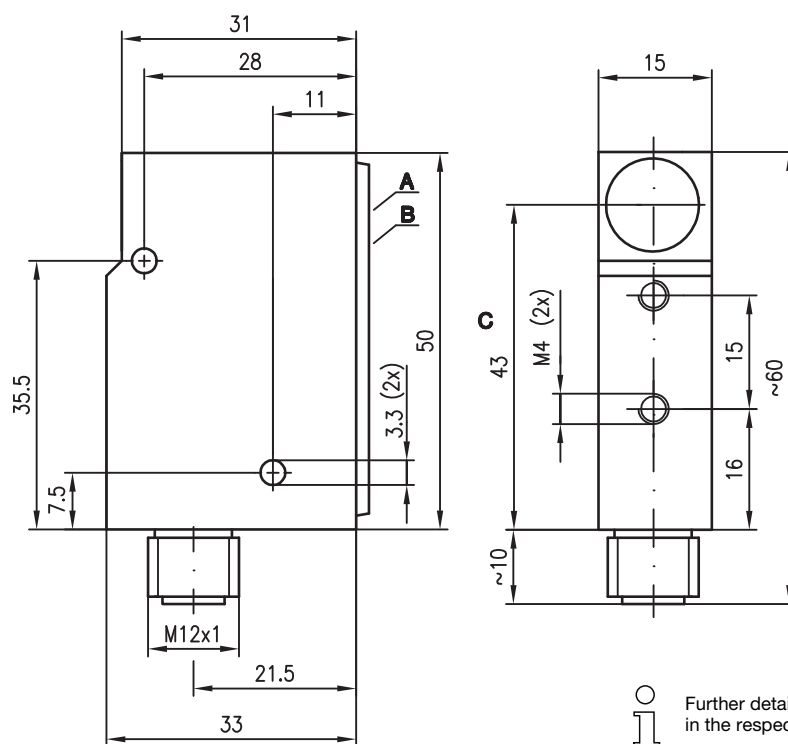
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW OF SWITCHING ULTRASONIC SENSORS

Dimensioned drawing





- A** Indicator diodes
- B** Sensitivity adjustment
- C** Center of ultrasonic transducer

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18 SERIES

Ultrasonic sensors	Operating range	Page
 Ultrasonic throughbeam sensor		336

Other 18 Series products:

 Retro-reflective sensors	RK(R) 18, (I)PRK 18	84
 AS-interface Sensors	IPRK 18	622



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
Mechanical data	Housing	Metal
	Weight	70g each
Environmental data	Ambient temperature (operation/storage)	0°C ... +70°C -40°C ... +85°C
	VDE safety class	III
	Protection class	IP 65
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 629 onwards

Features

- Color and transmission independent detection of objects, even in humid and foggy environment
- Optimized for air transport systems
- Metal housing
- Insensitive to dust
- Detection of narrow gaps



Optical Sensor

- Ultrasonic sensors Page 691

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Sensors

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Sensors

SWITCHING ULTRASONIC SENSORS

Part description Part No.:	Operating range [mm] <input type="checkbox"/> ¹⁾	Operating voltage	Ultrasonic frequency	Switching frequency	Output	Switching
Ultrasonic throughbeam sensors		▶ = Transmitter ◀ = Receiver				
LSSU 18 - S12 50103365 LSEU 18 / 24 - S12 50103364	<input type="text" value="0"/> <input type="text" value="650"/>	10 ... 30VDC	300kHz	100Hz	1 PNP 1 NPN	Object detected

1) Over complete temperature range, measurement object ≥ 20x20mm²

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Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC



18 Series
Ultrasonic sensors



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Special
Sensors

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Sensors

Light
Curtains

Protective
Sensors

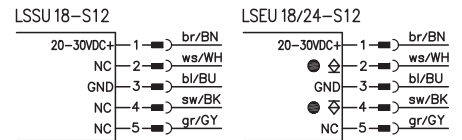
Connection	Repeatability	Option	Accessories
M12 connector		1, 2, 3, 4	a, b, c, d, e, f



Optical Sensor

- Ultrasonic sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

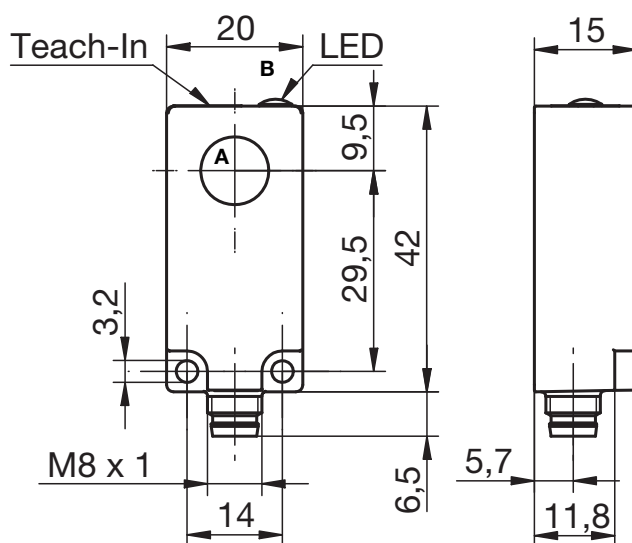


Options

- 1 Sensitivity adjustment via step switch
- 2 IP 65 metal housing
- 3 Bottle counting in the air conveyor
- 4 UL approval

OVERVIEW OF SWITCHING ULTRASONIC SENSORS






Dimensioned drawing





Further details can be found in the respective data sheet.

- A** Active surface
- B** Green indicator diode

We reserve the right to make changes • US_420_Overview_EN.fm

				
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HRTU 420



Ultrasonic sensors	Scanning range	Page
 Ultrasonic scanner HRTU 420		340



Common technical data		
Electrical data	Operating voltage U_B	12 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Output current	$\leq 200\text{mA}$
Indicators	Green LED	Switching/teach state
Mechanical data	Housing	Plastic (PE)
	Weight	Approx. 10g
Environmental data	Ambient temperature (operation/storage)	-10°C ... +60°C / -40°C ... +85°C
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2, UL 508

Features

- Sensors in cubic plastic housing with protection class IP 67
- Measurement range up to 1000mm
- Various opening angles and sound cone geometries
- Switching behavior largely independent of surface properties
- Precise switching point adjustment through teach button or via a cable
- Protection against erroneous operation by self-locking teach button

Optical Sensor	
● Ultrasonic sensors	Page 691

SWITCHING ULTRASONIC SENSORS

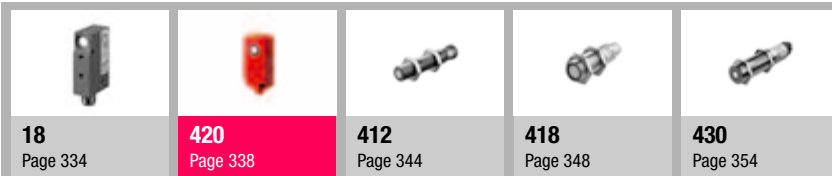
Part description Part No.:	Scanning range [mm]	Operating voltage	Ultrasonic frequency	Switching frequency	Output	Switching
Ultrasonic scanners with background suppression						
HRTU 420 / 4NO.2 - S - S8 50113992	10 200	12 ... 30VDC	380kHz	50Hz	1 PNP	NO (normally open)
HRTU 420 / 4NC.2 - S - S8 50113989	10 200	12 ... 30VDC	380kHz	50Hz	1 PNP	NC (normally closed)
HRTU 420 / 2NO.2 - S - S8 50113986	10 200	12 ... 30VDC	380kHz	50Hz	1 NPN	NO (normally open)
HRTU 420 / 2NC.2 - S - S8 50113983	10 200	12 ... 30VDC	380kHz	50Hz	1 NPN	NC (normally closed)
HRTU 420 / 4NO.2 - S8 50113991	40 400	12 ... 30VDC	290kHz	20Hz	1 PNP	NO (normally open)
HRTU 420 / 4NC.2 - S8 50113988	40 400	12 ... 30VDC	290kHz	20Hz	1 PNP	NC (normally closed)
HRTU 420 / 2NO.2 - S8 50113985	40 400	12 ... 30VDC	290kHz	20Hz	1 NPN	NO (normally open)
HRTU 420 / 2NC.2 - S8 50113982	40 400	12 ... 30VDC	290kHz	20Hz	1 NPN	NC (normally closed)

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104529	K - D M8W - 4P - 10m - PVC	Connection cable 10000mm, M8 angular, 4-pin, PVC
f 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC

We reserve the right to make changes • US_420_1_EN.fm



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HRTU 420
Ultrasonic sensors



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Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

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Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

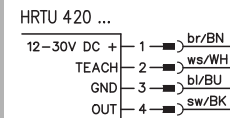
Connection	Repeatability	Option	Accessories
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 4	a, b, c, d, e, f



Optical Sensor

- Ultrasonic sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection







Options

- 1 Teach-in via teach input or teach button
- 2 Automatic locking of the teach button
- 3 Especially narrow sound cone
- 4 UL approval

www.leuze.com/en/ultrasonics/

SWITCHING ULTRASONIC SENSORS

Part description Part No.:	Scanning range [mm]	Operating voltage	Ultrasonic frequency	Switching frequency	Output	Switching
Ultrasonic scanners with background suppression						
HRTU 420 / 4NO.2 - L - S8 50113990		12 ... 30VDC	240kHz	10Hz	1 PNP	NO (normally open)
HRTU 420 / 4NC.2 - L - S8 50113987		12 ... 30VDC	240kHz	10Hz	1 PNP	NC (normally closed)
HRTU 420 / 2NO.2 - L - S8 50113984		12 ... 30VDC	240kHz	10Hz	1 NPN	NO (normally open)
HRTU 420 / 2NC.2 - L - S8 50113981		12 ... 30VDC	240kHz	10Hz	1 NPN	NC (normally closed)

We reserve the right to make changes • US_420_2_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104529	K - D M8W - 4P - 10m - PVC	Connection cable 10000mm, M8 angular, 4-pin, PVC
f 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC



420 Series
Ultrasonic sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

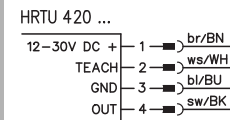
Connection	Repeatability	Option	Accessories
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f
M8 connector	≤ 0.5 mm	1, 2, 3, 4	a, b, c, d, e, f



Optical Sensor

- Ultrasonic sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

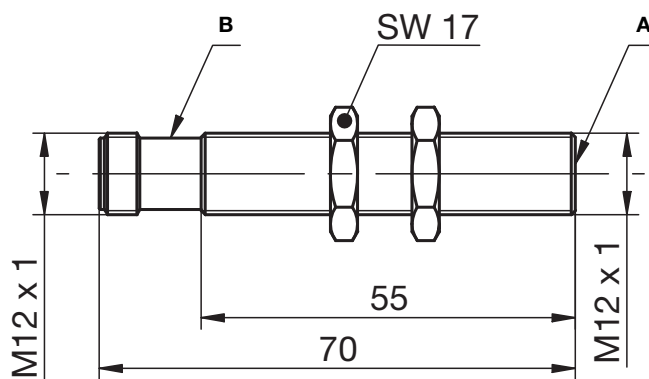



Options

- 1 Teach-in via teach input or teach button
- 2 Automatic locking of the teach button
- 3 Particularly wide sound cone
- 4 UL approval

OVERVIEW OF SWITCHING ULTRASONIC SENSORS






Dimensioned drawing




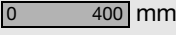
 Further details can be found in the respective data sheet.

- A** Active surface
- B** Green indicator diode

We reserve the right to make changes • US_412_Overview_EN.fm

				
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HRTU 412



Ultrasonic sensors	Scanning range	Page
 Ultrasonic scanner HRTU 412	 mm	346



Common technical data		
Electrical data	Operating voltage U_B	12 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Output current	$\leq 200\text{mA}$
Indicators	Green LED	Switching/teach state
Mechanical data	Housing	Nickel-faced brass
	Weight	Approx. 30g
Environmental data	Ambient temperature (operation/storage)	-10°C ... +60°C / -40°C ... +85°C
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2, UL 508
	Mounting systems for this series can be found from page 632 onwards	

Features

- Sensors in M12 cylindrical housing
- Operating ranges up to 400mm
- Various opening angles and sound cone geometries
- Switching behavior largely independent of surface properties
- Precise switching point adjustment through teach-in via a cable

Optical Sensor	
● Ultrasonic sensors	Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

**Ultrasonic
Sensors**

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SWITCHING ULTRASONIC SENSORS

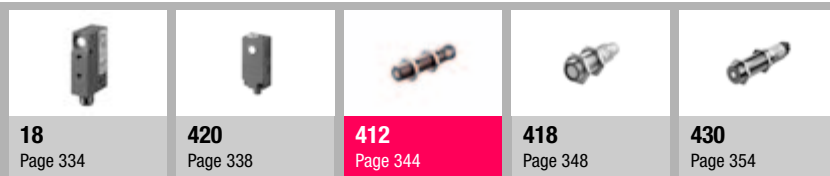
Part description Part No.:	Scanning range [mm]	Operating voltage	Ultrasonic frequency	Switching frequency	Output	Switching
Ultrasonic scanners with background suppression						
HRTU 412 / 4NO.2 - S - S12 50113993	10 200	12 ... 30VDC	380kHz	50Hz	1 PNP	NO (normally open)
HRTU 412 / 4NC.2 - S - S12 50113995	10 200	12 ... 30VDC	380kHz	50Hz	1 PNP	NC (normally closed)
HRTU 412 / 2NO.2 - S - S12 50113997	10 200	12 ... 30VDC	380kHz	50Hz	1 NPN	NO (normally open)
HRTU 412 / 2NC.2 - S - S12 50113999	10 200	12 ... 30VDC	380kHz	50Hz	1 NPN	NC (normally closed)
HRTU 412 / 4NO.2 - S12 50113994	40 400	12 ... 30VDC	290kHz	20Hz	1 PNP	NO (normally open)
HRTU 412 / 4NC.2 - S12 50113996	40 400	12 ... 30VDC	290kHz	20Hz	1 PNP	NC (normally closed)
HRTU 412 / 2NO.2 - S12 50113998	40 400	12 ... 30VDC	290kHz	20Hz	1 NPN	NO (normally open)
HRTU 412 / 2NC.2 - S12 50114000	40 400	12 ... 30VDC	290kHz	20Hz	1 NPN	NC (normally closed)

We reserve the right to make changes • US_412_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



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Page 354

412 Series
Ultrasonic sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

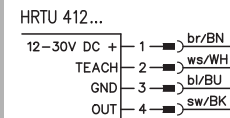
Connection	Repeatability	Option	Accessories
M12 connector	≤ 0.5mm	1, 2, 3	a, b, c, d, e, f
M12 connector	≤ 0.5mm	1, 2, 3	a, b, c, d, e, f
M12 connector	≤ 0.5mm	1, 2, 3	a, b, c, d, e, f
M12 connector	≤ 0.5mm	1, 2, 3	a, b, c, d, e, f
M12 connector	≤ 0.5mm	1, 3	a, b, c, d, e, f
M12 connector	≤ 0.5mm	1, 3	a, b, c, d, e, f
M12 connector	≤ 0.5mm	1, 3	a, b, c, d, e, f
M12 connector	≤ 0.5mm	1, 3	a, b, c, d, e, f



Optical Sensor

- Ultrasonic sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

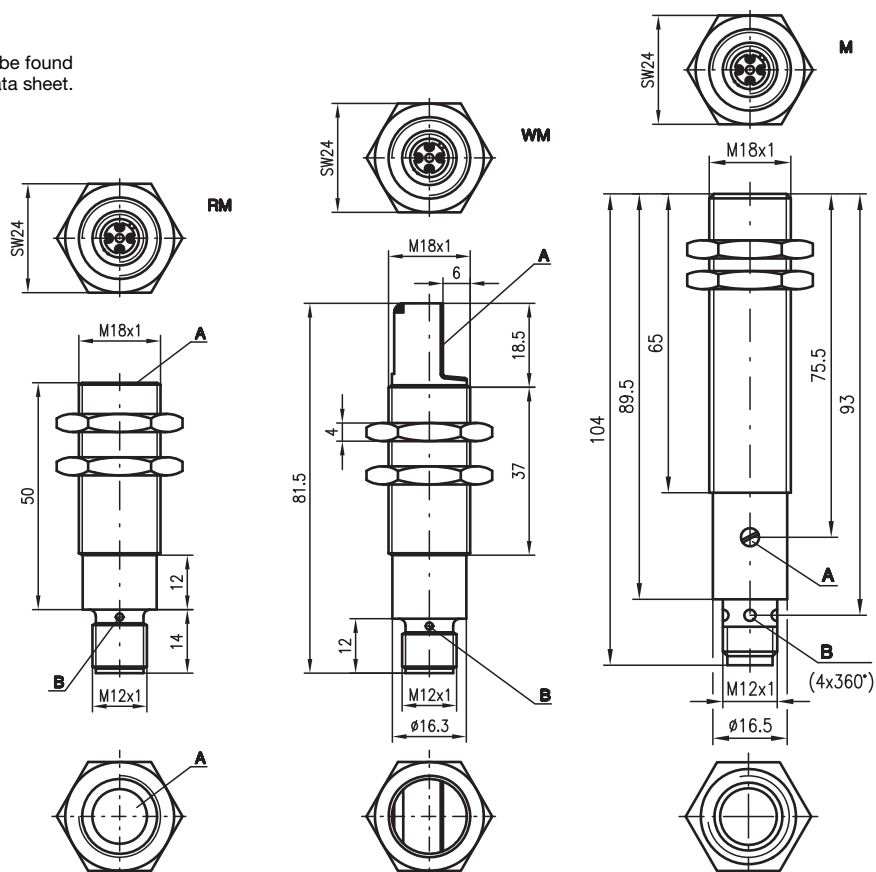
- 1 Teach-in via teach input
- 2 Especially narrow sound cone
- 3 UL approval

OVERVIEW OF SWITCHING ULTRASONIC SENSORS

Dimensioned drawing



Further details can be found in the respective data sheet.






- A** Active surface
- B** Indicator diode

We reserve the right to make changes • US_418_Overview_EN.fm

				
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HRTU 418

Ultrasonic sensors	Scanning range	Page
 Ultrasonic scanner HRTU 418		350



Other 418 Series products:		
 Ultrasonic distance sensors	HRTU 418	302



Common technical data		
Electrical data	Operating voltage U_B	20 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 60\text{mA}$
	Output current	$\leq 150\text{mA}$
Indicators	Yellow LED	Switching state/teach-in
Mechanical data	Housing	Nickel-faced brass
	Weight	50g
Environmental data	Ambient temperature (operation/storage)	-25°C ... +70°C / -40°C ... +85°C
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2, UL 508
	Mounting systems for this series can be found from page 630 onwards	

Features

- **Color and transmission independent detection of objects**
- **Switching behavior largely independent of surface properties**
- **Distance teachable**
- **Small construction**

Optical Sensor	
● Ultrasonic sensors	Page 691

- Photoel. sensors/
light scanners,
cubic housing
- Photoel. sensors/
light scanners,
cylindric housing
- Measuring
Sensors
- Ultrasonic
Sensors**
- Inductive
Switches
- Forked
Sensors
- Special
Sensors
- Fiber Optic
Sensors
- Light
Curtains
- Protective
Sensors

SWITCHING ULTRASONIC SENSORS

Part description Part No.:	Scanning range ¹⁾ [mm] <input type="checkbox"/>	Operating voltage	Ultrasonic frequency	Switching frequency	Output	Switching
Ultrasonic scanners with background suppression, short construction						
HRTU 418 RM/P - 5020 - 200 - S12 50038635	<input type="checkbox"/> 30 ... 200	20 ... 30VDC	400kHz	10Hz	1 PNP	Object detected
HRTU 418 WM/P - 5020 - 200 - S12 50038636	<input type="checkbox"/> 30 ... 200	20 ... 30VDC	400kHz	10Hz	1 PNP	Object detected
HRTU 418 RM/P - 5220 - 400 - S12 50109016	<input type="checkbox"/> 25 400	20 ... 30VDC	300kHz	10Hz	2 PNP	Object detected
HRTU 418 WM/P - 5220 - 400 - S12 50109017	<input type="checkbox"/> 25 400	20 ... 30VDC	300kHz	10Hz	2 PNP	Object detected
HRTU 418 RM/P - 3020 - 700 - S12 50038639	<input type="checkbox"/> 100 700	20 ... 30VDC	200kHz	5Hz	1 PNP	Object detected
HRTU 418 WM/P - 3020 - 700 - S12 50038640	<input type="checkbox"/> 100 700	20 ... 30VDC	200kHz	5Hz	1 PNP	Object detected
HRTU 418 RM/P - 5220 - 700 - S12 50109018	<input type="checkbox"/> 50 700	20 ... 30VDC	200kHz	5Hz	2 PNP	Object detected
HRTU 418 WM/P - 5220 - 700 - S12 50109019	<input type="checkbox"/> 50 700	20 ... 30VDC	200kHz	5Hz	2 PNP	Object detected

1) Over complete temperature range, measurement object $\geq 20 \times 20 \text{mm}^2$

We reserve the right to make changes • US_418_2_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC



418 Series
Ultrasonic sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

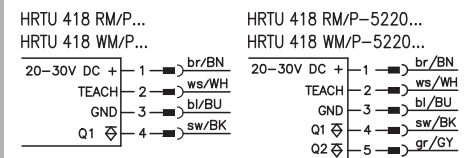
Connection	Repeatability	Option	Accessories
M12 connector	± 1 mm	1, 3	a, b, c, d
M12 connector	± 1 mm	1, 2, 3	a, b, c, d
M12 connector	± 1 mm	1, 3	e, f
M12 connector	± 1 mm	1, 2, 3	e, f
M12 connector	± 1 mm	1, 3	a, b, c, d
M12 connector	± 1 mm	1, 2, 3	a, b, c, d
M12 connector	± 1 mm	1, 3	e, f
M12 connector	± 1 mm	1, 2, 3	e, f



Optical Sensor

- Ultrasonic sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach-in via teach input
- 2 90° ultrasonic head (radial sound emission)
- 3 UL approval

SWITCHING ULTRASONIC SENSORS

Part description Part No.:	Scanning range [mm]	Operating voltage	Ultrasonic frequency	Switching frequency	Output	Switching
Ultrasonic scanners with background suppression, long construction						
HRTU 418 M/P - 5010 - 300 - S12 50036257	<input type="text" value="50 ... 300"/> 1)	20 ... 30VDC	400kHz	5Hz	1 PNP	Object detected
HRTU 418 M/P - 3010 - 1000 - S12 50036258	<input type="text" value="150 ... 1000"/> 1)	20 ... 30VDC	200kHz	4Hz	1 PNP	Object detected

1) Over complete temperature range, measurement object $\geq 10 \times 10 \text{mm}^2$

We reserve the right to make changes • US_418_3_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

				
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418 Series
Ultrasonic sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

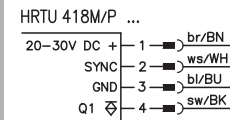
Connection	Repeatability	Option	Accessories
M12 connector	± 1 mm	1, 2, 3, 4	a, b, c, d, e, f
M12 connector	± 2 mm	1, 2, 3, 4	a, b, c, d, e, f



Optical Sensor

- Ultrasonic sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



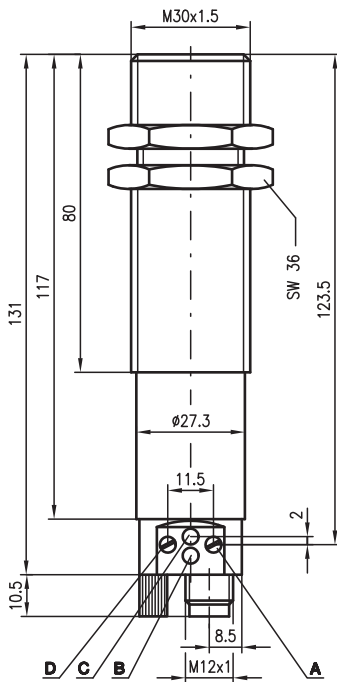
Options

- 1 Configurable via programming unit and software
- 2 Sensor synchronization via SYNC input
- 3 Configurable multiplex operation
- 4 UL approval

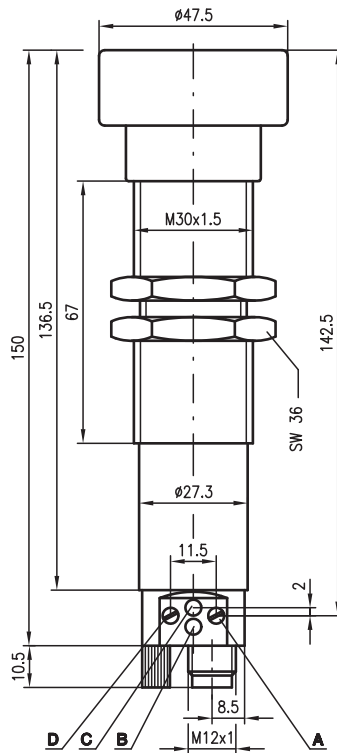
OVERVIEW OF SWITCHING ULTRASONIC SENSORS

Dimensioned drawing

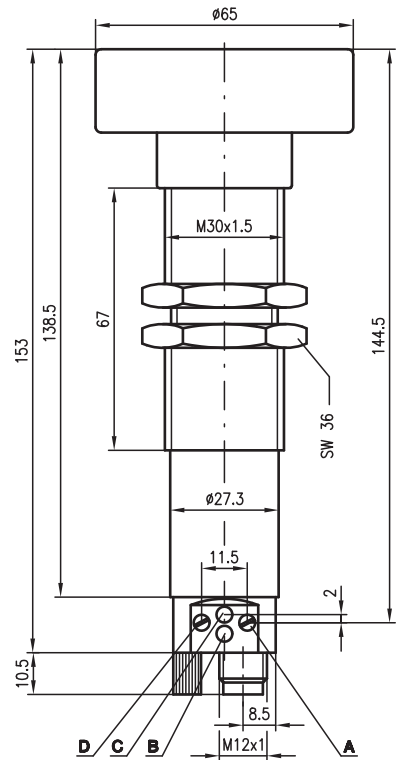
VRTU 430...-300-S12
VRTU 430...-1300-S12




VRTU 430...-3000-S12



VRTU 430...-6000-S12





- A Setting of cut-out point Q1
- B Indicator diode Q2
- C Indicator diode Q1
- D Setting of cut-in point Q1/cut-out point Q2

 Further details can be found in the respective data sheet.

We reserve the right to make changes • US_430_Overview_EN.fm

				
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VRTU 430

Ultrasonic sensors	Scanning range	Page
 Ultrasonic scanner VRTU 430		356



Other 430 Series products:		
 Ultrasonic distance sensors	VRTU 430	306



Common technical data		
Electrical data	Operating voltage U_B	20 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 50\text{mA}$
	Output current	$\leq 300\text{mA}$
Indicators	Yellow LED	Switching output
	Flashing yellow LED	Programming error
Mechanical data	Housing	Metal (CuZn)
	Weight	210g ... 380g
Environmental data	Ambient temperature (operation/storage)	-25°C ... +70°C / -40°C ... +85°C
	VDE safety class	III
	Protection class	IP 65
	Standards applied	IEC 60947-5-2, UL 508
	Mounting systems for this series can be found from page 632 onwards	

Features

- Ideal for detection of levels of liquids, bulk materials, transparent media, ...
- Distance information largely independent of surface properties
- PC-configuration software for configuring sensor and switching output
- Up to 10 devices can be synchronized via the SYNC input
- Separate adjustment of start and end of switching range (Q1) via potentiometer and PC

Optical Sensor
<ul style="list-style-type: none"> ● Ultrasonic distance sensors Page 691

www.leuze.com/en/ultrasonics/

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SWITCHING ULTRASONIC SENSORS

Part description Part No.:	Operating range [mm] <input type="checkbox"/>	Operating voltage	Ultrasonic frequency	Switching frequency	Output	Switching
Ultrasonic scanners						
VRTU 430 M/P - 5110 - 300 - S12 50036261	<input type="checkbox"/> 60 ... 300 ¹⁾	20 ... 30VDC	400kHz	8Hz	2 PNP	Object detected
VRTU 430 M/P - 3110 - 1300 - S12 50036262	<input type="checkbox"/> 200 ... 1300 ¹⁾	20 ... 30VDC	200kHz	4Hz	2 PNP	Object detected
VRTU 430 M/P - 2110 - 3000 - S12 50036263	<input type="checkbox"/> 400 3000 ²⁾	20 ... 30VDC	120kHz	2Hz	2 PNP	Object detected
VRTU 430 M/P - 1110 - 6000 - S12 50036264	<input type="checkbox"/> 600 6000 ³⁾	20 ... 30VDC	80kHz	1Hz	2 PNP	Object detected

- 1) Over complete temperature range, measurement object $\geq 10 \times 10 \text{mm}^2$
 2) Over complete temperature range, measurement object $\geq 50 \times 50 \text{mm}^2$
 3) Over complete temperature range, measurement object $\geq 100 \times 100 \text{mm}^2$

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC



430 Series
Ultrasonic sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

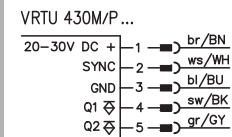
Connection	Repeatability	Option	Accessories
M12 connector	± 0.45mm	1, 2, 3, 4	a, b, c, d, e, f
M12 connector	± 2mm	1, 2, 3, 4	a, b, c, d, e, f
M12 connector	± 5mm	1, 2, 3, 4	a, b, c, d, e, f
M12 connector	± 9mm	1, 2, 3, 4	a, b, c, d, e, f



Optical Sensor

- Ultrasonic sensors Page 691
- Connection types Page 694
- Outputs Page 694






Electrical connection



Options

- 1 Configurable via programming unit and software
- 2 Sensor synchronization via SYNC input
- 3 Configurable multiplex operation
- 4 UL approval

SERIES SELECTION TABLE

Series	Dimensions in mm (HxWxL)	Typ. scan range limit S_n in mm	Installation		Switching output / function				
			Embedded	Non-embedded	PNP	NPN	NO - normally open	NC - normally closed	
 Series									
 IS 255	5 x 5 x 25	1.5	•		•	•	•	○	
 IS 288	8 x 8 x 50	1.5	•		•	•	•	○	
		2.0	•		•	○	•	•	
		3.0	•		•	○	•	○	
 IS 240	40 x 12 x 26	4.0	•		•	•	•	•	
		8.0		•	•	•	•	•	
 IS 244	40 x 40 x 67 40 x 40 x 120	20.0	•		•	•	•	•	
		40.0		•	•	•	•	•	

We reserve the right to make changes • IS_Auswahl_Applikation_kubisch_EN.fm

INDUCTIVE SWITCHES, CUBIC

Max. switching frequency	Operating voltage	Connection			Housing material		Protection class		Page
		M8 connector	M12 connector	Cable, 2 m, PVC	Chromium-plated brass	Plastic (PA)	IP 67	IP 69K	
3000Hz	10 ... 30VDC	○		●	●		●		370
5000Hz	10 ... 30VDC	●		●	●		●		374
3000Hz	10 ... 30VDC	●		●	●		●		
1000Hz	10 ... 30VDC	●		●	●		●		
1400Hz	10 ... 30VDC	●		●		●	●		362
1400Hz	10 ... 30VDC	●		●		●	●		
150Hz	10 ... 30VDC		●	●		●	●		366
150Hz	10 ... 30VDC		●	●		●	●		

○ = on request

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors








Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SERIES SELECTION TABLE

Series	Dimensions in mm (Ø x L)	Typ. scan range limit S _n in mm	Installation		Switching output / function			
			Embedded	Non-embedded	PNP	NPN	NO - normally open	NC - normally closed
 IS 204	Ø 4 x 25	1.5	●		●	○	●	○
 IS 205	M5 x 38	1.5	●		●	○	●	○
 IS 206	Ø 6.5 x 35	2.0	●		●	○	●	○
		3.0	●		●	○	●	○
 IS 208	M8 x 45	1.5	●		●	○	●	
		2.0	●		●	●	●	●
		2.5		●	●	○	●	
		4.0		●	●	○	●	○
 IS 212	M12 x 50	2.0	●		●	○	●	
		4.0	●		●	●	●	●
		4.0		●	●	○	●	
		6.0 ¹⁾	●		●	○	●	
		6.0	●		●	●	●	○
		8.0		●	●	●	●	○
		10.0 ¹⁾		●	●	○	●	
10.0		●	●	○	●	○		
 IS 218	M18 x 50	5.0	●		●	○	●	
		8.0	●		●	●	●	●
		8.0		●	●	○	●	
		10.0 ¹⁾	●		●	○	●	
		12.0	●		●	●	●	○
		20.0 ¹⁾		●	●	○	●	
20.0		●	●	○	●	○		
 IS 230	M30 x 60	10.0	●		●	○	●	
		15.0		●	●	○	●	
		20.0 ¹⁾	●		●	○	●	
		22.0	●		●	●	●	●
		40.0 ¹⁾		●	●	○	●	
		40.0		●	●	●	●	○

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INDUCTIVE SWITCHES, CYLINDRICAL

Max. switching frequency	Operating voltage	Connection			Housing material		Protection class		Page
		M8 connector	M12 connector	Cable, 2 m, PVC	Chromium-plated brass	Stainless steel	IP 67	IP 69K	
									378
3000Hz	10 ... 30VDC	○		●		●	●		
									382
3000Hz	10 ... 30VDC	●		●		●	●		
5000Hz	10 ... 30VDC	●		●		●	●		386
1000Hz	10 ... 30VDC			●		●	●		
5000Hz	10 ... 30VDC	●	●	●		●	●		390
5000Hz	10 ... 30VDC	●		●		●	●		
5000Hz	10 ... 30VDC	●	●	●		●	●		
3500Hz	10 ... 30VDC	●		●		●	●		
3000Hz	10 ... 30VDC		●	●	●		●		400
2000Hz	10 ... 30VDC		●	●	●		●		
2000Hz	10 ... 30VDC		●	●	●		●		
800Hz	10 ... 30VDC		●	●		●	●	●	
600Hz	10 ... 30VDC		●	●	●		●		
1500Hz	10 ... 30VDC		●	●	●		●		
400Hz	10 ... 30VDC		●	●		●	●	●	
400Hz	10 ... 30VDC		●	●	●		●		
2000Hz	10 ... 30VDC		●	●	●		●		410
1500Hz	10 ... 30VDC		●	●	●		●		
2000Hz	10 ... 30VDC		●	●	●		●		
200Hz	10 ... 30VDC		●	●		●	●	●	
500Hz	10 ... 30VDC		●	●	●		●		
200Hz	10 ... 30VDC		●	●		●	●	●	
200Hz	10 ... 30VDC		●	●	●		●		
1200Hz	10 ... 30VDC		●	●	●		●		420
700Hz	10 ... 30VDC		●	●	●		●		
100Hz	10 ... 30VDC		●	●		●	●	●	
200Hz	10 ... 30VDC		●	●	●		●		
100Hz	10 ... 30VDC		●	●		●	●	●	
90Hz	10 ... 30VDC		●	●	●		●		

1) Food+Beverage version

○ = on request

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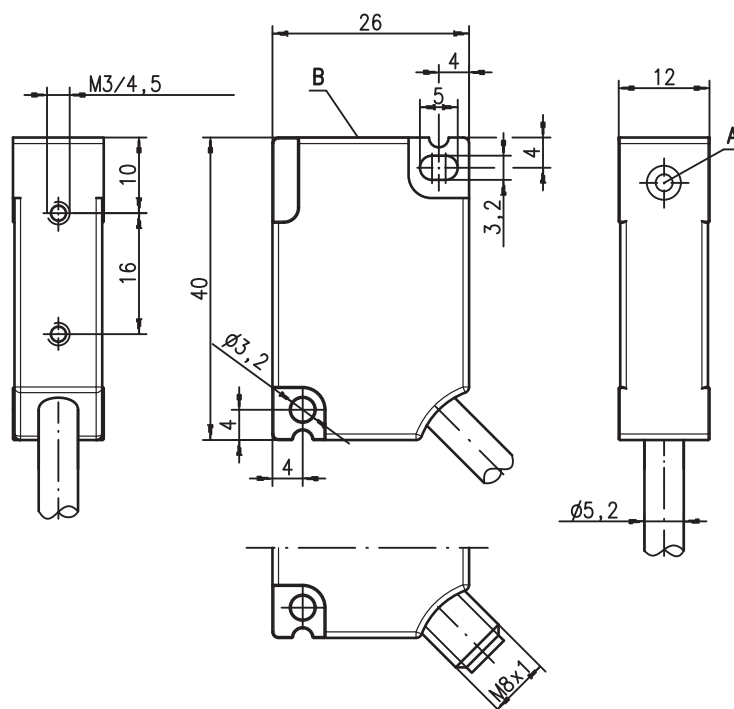
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Protective
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OVERVIEW












Dimensioned drawing





- A** Active surface
- B** Yellow indicator diode

i Further details can be found in the respective data sheet.

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IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 240 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 <input type="text" value="4"/> mm	364
 Non-embedded	0 <input type="text" value="8"/> mm	364



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 250 mA
	Residual current I_r	≤ 10 μ A
	Voltage drop U_d	≤ 2.5 V
	Hysteresis H of S_r	$\leq 5\%$
	Repeatability	$\leq 10\%$
Indicators	Yellow LED	Switching state
Mechanical data	Standard target (Fe360)	12 x 12mm ² (24 x 24mm ²)
	Weight (connector/cable)	Approx. 18g/108g
Environmental data	Ambient temperature	-25°C ... +70°C
	Protective circuit	Polarity reversal protection, short circuit protection
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 61000-4-2 air 8kV IEC 61000-4-3 10V/m IEC 61000-4-4 2kV

Features

- Slim construction 40 x 12mm
- Plastic housing
- Integrated short circuit and polarity reversal protection
- LED for switching state



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

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INDUCTIVE SWITCHES

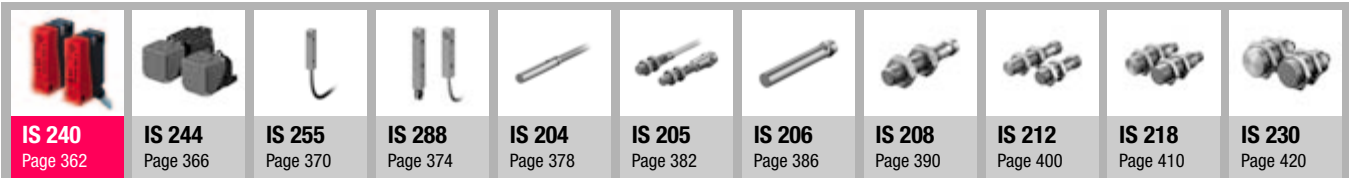
Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches 40 x 12, embedded installation					
IS 240 PP/44 - 4E0 50114207		1400Hz	Embedded	2 x PNP	NO / NC complementary (make-contact/ break-contact)
IS 240 PP/44 - 4E0 - S8.4 50114208		1400Hz	Embedded	2 x PNP	NO / NC complementary (make-contact/ break-contact)
IS 240 PP/4NO - 4E0 - S8.3 50117797		1400Hz	Embedded	1 x PNP	NO (normally open)
IS 240 PP/22 - 4E0 50114203		1400Hz	Embedded	2 x NPN	NO / NC complementary (make-contact/ break-contact)
IS 240 PP/22 - 4E0 - S8.4 50114204		1400Hz	Embedded	2 x NPN	NO / NC complementary (make-contact/ break-contact)
Inductive switches 40 x 12, non-embedded installation					
IS 240 PP/44 - 8N0 50114209		1400Hz	Non-embedded	2 x PNP	NO / NC complementary (make-contact/ break-contact)
IS 240 PP/44 - 8N0 - S8.4 50114210		1400Hz	Non-embedded	2 x PNP	NO / NC complementary (make-contact/ break-contact)
IS 240 PP/22 - 8N0 50114205		1400Hz	Non-embedded	2 x NPN	NO / NC complementary (make-contact/ break-contact)
IS 240 PP/22 - 8N0 - S8.4 50114206		1400Hz	Non-embedded	2 x NPN	NO / NC complementary (make-contact/ break-contact)

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104583	D M8A - 4P - SK	Cable socket, M8 axial, 4-pin, user-configurable

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IS 240 SERIES

Inductive Switches



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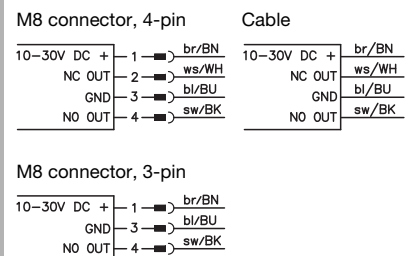
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2m, PVC	PA / PA	IP 67	
M8 connector	PA / PA	IP 67	c, d, e
M8 connector	PA / PA	IP 67	a, b
Cable, 2m, PVC	PA / PA	IP 67	
M8 connector	PA / PA	IP 67	c, d, e
Cable, 2m, PVC	PA / PA	IP 67	
M8 connector	PA / PA	IP 67	c, d, e
Cable, 2m, PVC	PA / PA	IP 67	
M8 connector	PA / PA	IP 67	c, d, e
Cable, 2m, PVC	PA / PA	IP 67	
M8 connector	PA / PA	IP 67	c, d, e



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

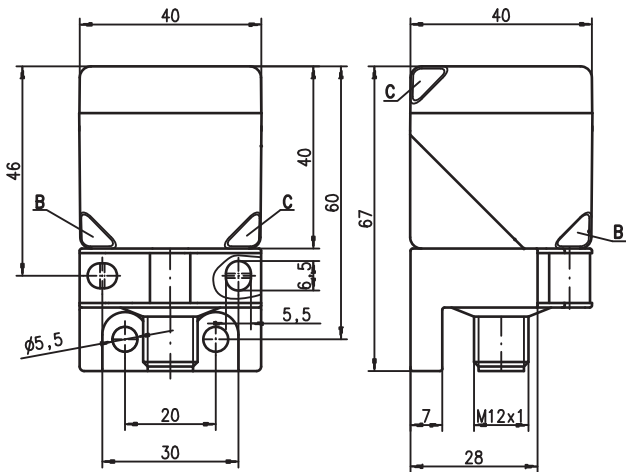
Electrical connection



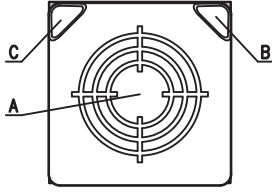
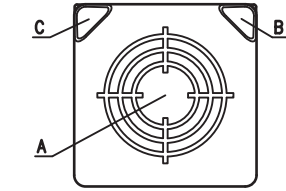
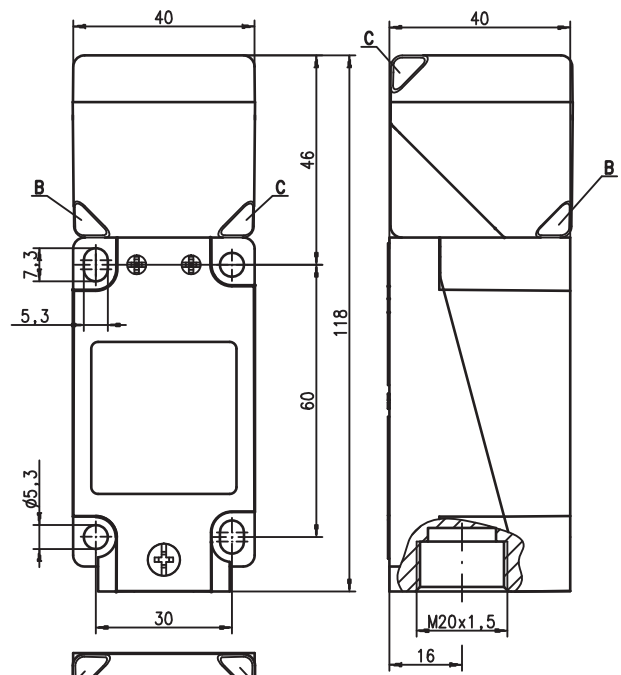
OVERVIEW

Dimensioned drawing


Types with M12 connector














Types with terminals





- A** Active surface
- B** Yellow indicator diode
- C** Green indicator diode

 Further details can be found in the respective data sheet.

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IS 244 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 20 mm	368
 Non-embedded	0 40 mm	368



Common technical data		
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 500 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	$\leq 5\%$
	Repeatability	$\leq 10\%$
Indicators	2x green LED	Ready to operate
	2x yellow LED	Switching state
Mechanical data	Standard target (Fe360)	60 x 60mm ² (120 x 120mm ²)
	Weight (connector/cable)	Approx. 130g/225g
Environmental data	Ambient temperature	-25°C ... +85°C
	Protective circuit	Polarity reversal protection, short circuit protection
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 61000-4-2 air 8kV IEC 61000-4-3 10V/m IEC 61000-4-4 2kV

Features

- **Classic construction 40 x 40mm**
- **Plastic housing**
- **Connection via M12 connector or terminals**
- **Integrated short circuit and polarity reversal protection**
- **LED for switching state**



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
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INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches 40 x 40, embedded installation					
IS 244 PP/44 - 20E - TB.4 50114213		150Hz	Embedded	2x PNP	NO / NC complementary (make-contact/ break-contact)
ISS 244 PP/44 - 20E - S12 50114217		150Hz	Embedded	2x PNP	NO / NC complementary (make-contact/ break-contact)
IS 244 PP/22 - 20E - TB.4 50114211		150Hz	Embedded	2xNPN	NO / NC complementary (make-contact/ break-contact)
ISS 244 PP/22 - 20E - S12 50114215		150Hz	Embedded	2xNPN	NO / NC complementary (make-contact/ break-contact)
Inductive switches 40 x 40, non-embedded installation					
IS 244 PP/44 - 40N - TB.4 50114214		150Hz	Non-embedded	2x PNP	NO / NC complementary (make-contact/ break-contact)
ISS 244 PP/44 - 40N - S12 50114218		150Hz	Non-embedded	2x PNP	NO / NC complementary (make-contact/ break-contact)
IS 244 PP/22 - 40N - TB.4 50114212		150Hz	Non-embedded	2xNPN	NO / NC complementary (make-contact/ break-contact)
ISS 244 PP/22 - 40N - S12 50114216		150Hz	Non-embedded	2xNPN	NO / NC complementary (make-contact/ break-contact)

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

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IS 244 SERIES
Inductive Switches



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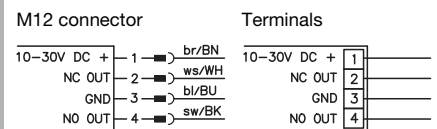
Connection	Material housing / active surface	Protection class	Accessories
Terminals	PA / PA	IP 67 IP 69K	
M12 connector	PA / PA	IP 67 IP 69K	a, b, c, d, e
Terminals	PA / PA	IP 67 IP 69K	
M12 connector	PA / PA	IP 67 IP 69K	a, b, c, d, e
Terminals	PA / PA	IP 67 IP 69K	
M12 connector	PA / PA	IP 67 IP 69K	a, b, c, d, e
Terminals	PA / PA	IP 67 IP 69K	
M12 connector	PA / PA	IP 67 IP 69K	a, b, c, d, e
Terminals	PA / PA	IP 67 IP 69K	
M12 connector	PA / PA	IP 67 IP 69K	a, b, c, d, e



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

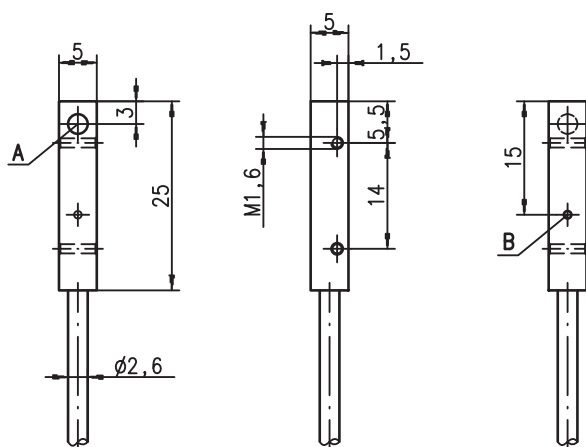
Electrical connection




www.leuze.com/en/inductive/

OVERVIEW







Dimensioned drawing




- A** Active surface
- B** Yellow indicator diode

 Further details can be found in the respective data sheet.

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IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 255 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 1.5 mm	372



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	$\leq 10\%$
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 2\%$
Indicators	Yellow LED	Switching state
Mechanical data	Standard target (Fe360)	5 x 5 mm ²
	Weight	Approx. 34g
Environmental data	Ambient temperature	-25°C ... +70°C
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 2 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Features

- Slim and short 5 x 5 mm cubical metal housing
- Chromium-plated brass housing
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
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INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches 5 x 5, embedded installation					
IS 255 MP/4NO - 1E5 50113209	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	3000Hz	Embedded	1 x PNP	NO (normally open)
IS 255 MP/4NO - 1E5, 200 - S8.3 50117200	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	3000Hz	Embedded	1 x PNP	NO (normally open)
IS 255 MP/2NO - 1E5 50113210	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	3000Hz	Embedded	1 x NPN	NO (normally open)

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Accessories / connection cables		More accessories can be found from page 643 onwards	
Part no.	Designation	Features	
a 50104521	K - D M8W - 3P - 2m - PVC	Connection cable 2000mm, M8 angular, 3-pin, PVC	
b 50104520	K - D M8A - 3P - 2m - PVC	Connection cable 2000mm, M8 axial, 3-pin, PVC	
c 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC	
d 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC	
e 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, insulation displacement connections, user-configurable	

										
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IS 255 SERIES
Inductive Switches



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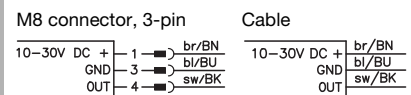
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PUR	Brass, chromium-plated / PA66	IP 67	
Cable, 0.2 m, with M8 connector	Brass, chromium-plated / PA66	IP 67	a, b, c, d, e
Cable, 2 m, PUR	Brass, chromium-plated / PA66	IP 67	



Inductive Switch

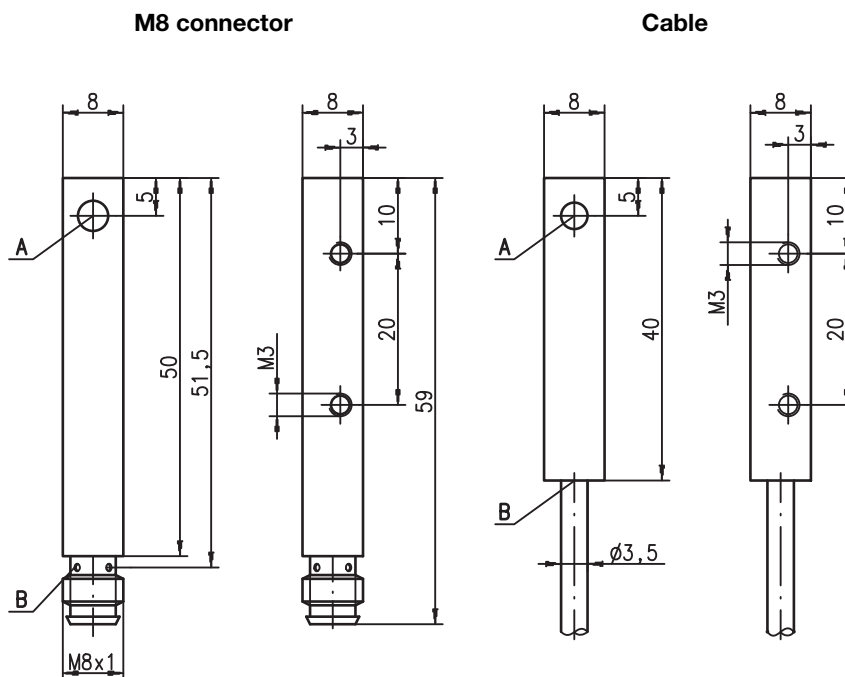
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection




OVERVIEW












Dimensioned drawing




- A** Active surface
- B** Yellow indicator diode

 Further details can be found in the respective data sheet.

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IS 288 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	<input type="text" value="0"/> <input type="text" value="3"/> mm	376



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	$\leq 5\% / \leq 10\%$
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 2\% / 5\%$
Indicators	Yellow LED	Switching state
Mechanical data	Standard target (Fe360)	8 x 8 (9 x 9) mm ²
	Weight (connector/cable)	Approx. 15g/45g
Environmental data	Ambient temperature	-25°C ... +70°C
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 3 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Mounting systems for this series can be found from page 643 onwards

Features

- Slim and short 8 x 8 mm cubical metal housing
- Nickel-plated brass housing
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

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INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches 8 x 8, embedded installation					
IS 288 MP/4NO - 1E5 - S8.3 50112886	<input type="checkbox"/> 0 1.2 <input type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 288 MP/4NO - 1E5 50112885	<input type="checkbox"/> 0 1.2 <input type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 288 MP/2NO - 1E5 50113208	<input type="checkbox"/> 0 1.2 <input type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x NPN	NO (normally open)
IS 288 MP/4NO - 2E0 - S8.3 50112888	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	3000Hz	Embedded	1 x PNP	NO (normally open)
IS 288 MP/4NO - 2E0 50112887	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	3000Hz	Embedded	1 x PNP	NO (normally open)
IS 288 MP/4NC - 2E0 50113783	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	3000Hz	Embedded	1 x PNP	NC (normally closed)
IS 288 MP/4NO - 3E0 - S8.3 50112890	<input type="checkbox"/> 0 2.4 <input type="checkbox"/> 0 3	1000Hz	Embedded	1 x PNP	NO (normally open)
IS 288 MP/4NO - 3E0 50112889	<input type="checkbox"/> 0 2.4 <input type="checkbox"/> 0 3	1000Hz	Embedded	1 x PNP	NO (normally open)

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Accessories / connection cables		More accessories can be found from page 643 onwards
Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50106692	K - D M8W - 3P - 5m - PUR	Connection cable 5000mm, M8 angular, 3-pin, PUR
d 50106691	K - D M8A - 3P - 5m - PUR	Connection cable 5000mm, M8 axial, 3-pin, PUR
e 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, user-configurable

										
IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 288 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

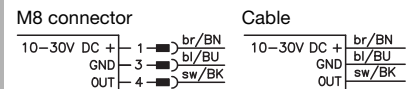
Connection	Material housing / active surface	Protection class	Accessories
M8 connector	Brass, nickel-plated / PBTP	IP 67	a, b, c, d, e
Cable, 2 m, PVC	Brass, nickel-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, nickel-plated / PBTP	IP 67	
M8 connector	Brass, nickel-plated / PBTP	IP 67	a, b, c, d, e
Cable, 2 m, PVC	Brass, nickel-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, nickel-plated / PBTP	IP 67	
M8 connector	Brass, nickel-plated / PBTP	IP 67	a, b, c, d, e
Cable, 2 m, PVC	Brass, nickel-plated / PBTP	IP 67	



Inductive Switch

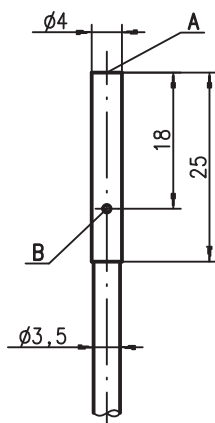
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection




OVERVIEW












Dimensioned drawing




- A** Active surface
- B** Yellow indicator diode

 Further details can be found in the respective data sheet.

We reserve the right to make changes • BR204_Overview_EN.fm

										
IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 204 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 1.5 mm	380



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	$\leq 10\%$
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 2\%$
Indicators	Yellow LED	Switching state
Mechanical data	Standard target (Fe360)	4.5 x 4.5 mm ²
	Weight	Approx. 32g
Environmental data	Ambient temperature	-25°C ... +70°C
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 2 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Features

- Slim and short cylindrical metal housing \varnothing 4mm
- Stainless steel housing
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors












Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches Ø 4, embedded installation					
IS 204 MP/4NO - 1E5 50113478	<input type="checkbox"/> 1.2 <input checked="" type="checkbox"/> 1.5	3000Hz	Embedded	1 x PNP	NO (normally open)

										
IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 204 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2m, PVC	Stainless steel / PA66	IP 67	



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

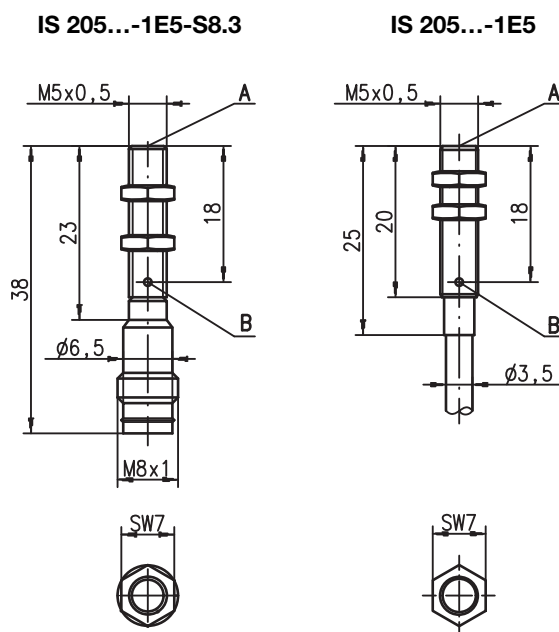
Electrical connection

Cable


10-30V DC +	br/BN
GND	bl/BU
OUT	sw/BK

OVERVIEW





Dimensioned drawing




- A** Active surface
- B** Yellow indicator diode

 Further details can be found in the respective data sheet.

We reserve the right to make changes • BR205_Overview_EN.fm

										
IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 205 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 1.5 mm	384



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	$\leq 10\%$
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 2\%$
Indicators	Yellow LED	Switching state
Mechanical data	Standard target (Fe360)	5 x 5 mm ²
	Weight (connector/cable)	Approx. 5g/approx. 35g
Environmental data	Ambient temperature	-25°C ... +70°C
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 2 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Features

- Slim and short cylindrical metal housing M5
- Stainless steel housing
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains






Protective
Sensors

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M5, embedded installation					
IS 205 MM/4NO - 1E5 50113213	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	3000Hz	Embedded	1 x PNP	NO (normally open)
IS 205 MM/4NO - 1E5 - S8.3 50113212	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	3000Hz	Embedded	1 x PNP	NO (normally open)

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Accessories / connection cables		More accessories can be found from page 643 onwards
Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50106692	K - D M8W - 3P - 5m - PUR	Connection cable 5000mm, M8 angular, 3-pin, PUR
d 50106691	K - D M8A - 3P - 5m - PUR	Connection cable 5000mm, M8 axial, 3-pin, PUR
e 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, user-configurable

										
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IS 205 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

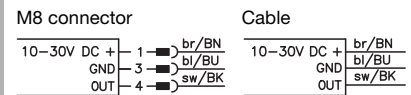
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2m, PVC	Stainless steel / PA66	IP 67	
M8 connector	Stainless steel / PA66	IP 67	a, b, c, d, e



Inductive Switch

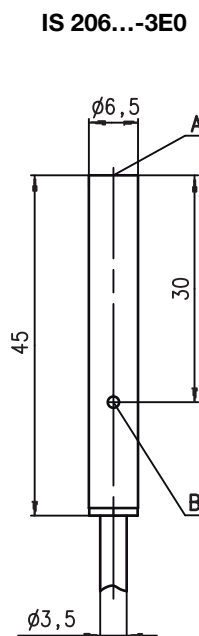
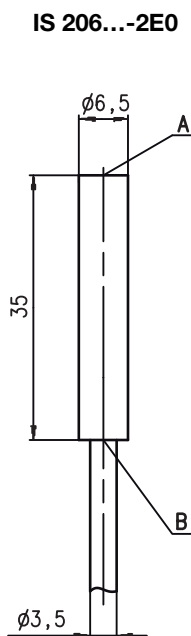
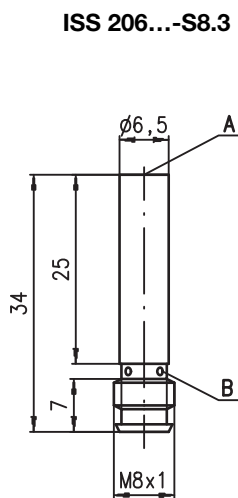
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection




OVERVIEW












Dimensioned drawing




- A** Active surface
- B** Yellow indicator diode

 Further details can be found in the respective data sheet.

We reserve the right to make changes • BR206_Overview_EN.fm

										
IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 206 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	<input type="text" value="0"/> <input type="text" value="3"/> mm	388



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	$\leq 10\%$
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 2\%/5\%$
Indicators	Yellow LED (360° visible)	Switching state
Mechanical data	Standard target (Fe360)	6.5 x 6.5 (9 x 9) mm ²
	Weight (connector/cable)	Approx. 4g/61g
Environmental data	Ambient temperature	-25°C ... +70°C
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 3 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Mounting systems for this series can be found from page 643 onwards

Features

- Slim and short cylindrical metal housing $\varnothing 6.5$ mm
- Chromium-plated brass or stainless steel housing
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state visible from 360°



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors












INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches Ø 6.5, embedded installation					
IS 206 MP/4NO - 2E0 50111437	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NO (normally open)
ISS 206 MP/4NO - 2E0 - S8.3 1) 50111438	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 206 MP/4NO - 3E0 50109686	<input type="checkbox"/> 0 2.4 <input type="checkbox"/> 0 3	1000Hz	Embedded	1 x PNP	NO (normally open)

1) Short construction

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Accessories / connection cables		More accessories can be found from page 643 onwards
Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50106692	K - D M8W - 3P - 5m - PUR	Connection cable 5000mm, M8 angular, 3-pin, PUR
d 50106691	K - D M8A - 3P - 5m - PUR	Connection cable 5000mm, M8 axial, 3-pin, PUR
e 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, user-configurable

										
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IS 206 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

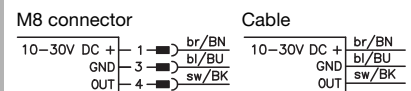
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2m, PVC	Stainless steel / PA12	IP 67	
M8 connector	Stainless steel / PA12	IP 67	a, b, c, d, e
Cable, 2m, PVC	Brass, chromium-plated / PBTP	IP 67	



Inductive Switch

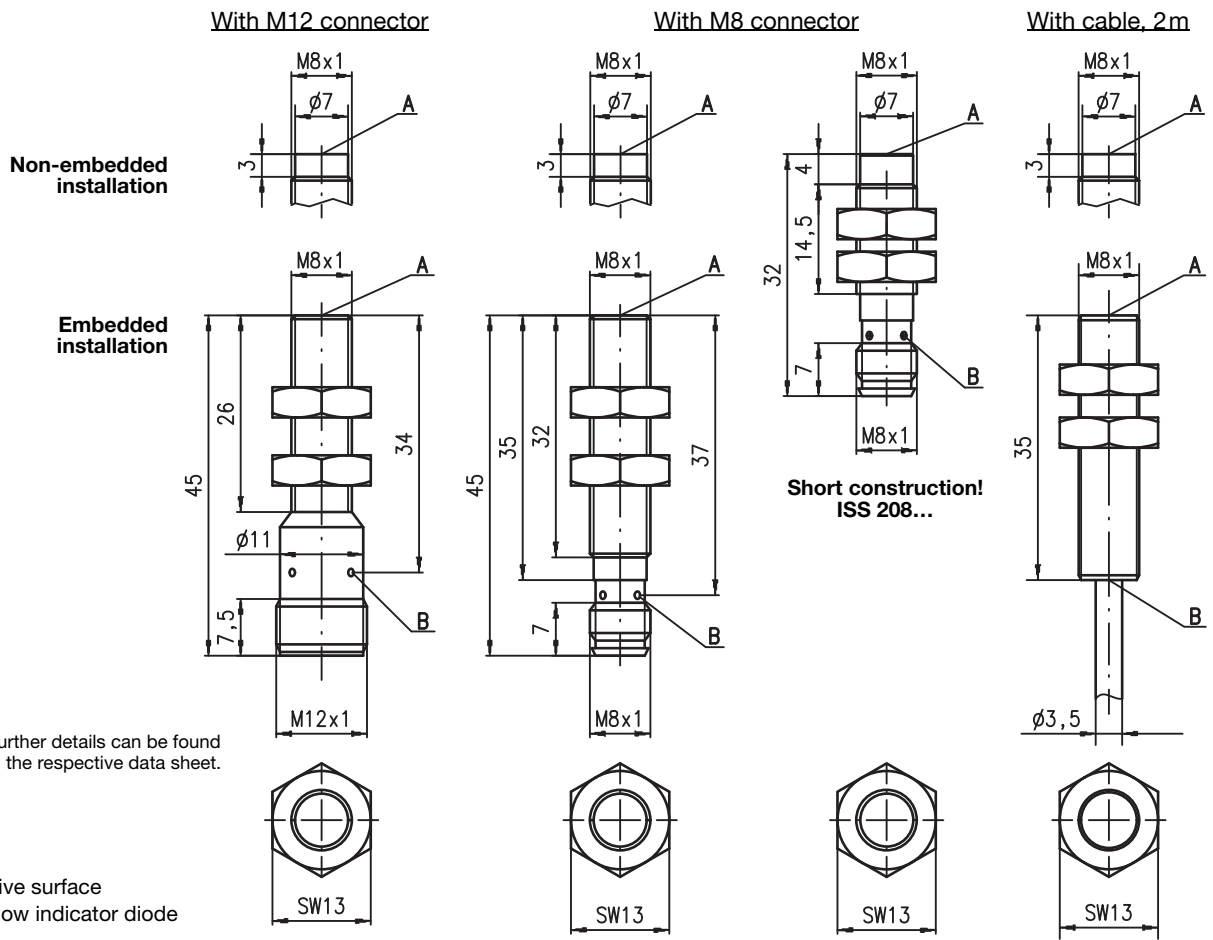
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection














OVERVIEW



Dimensioned drawing



We reserve the right to make changes • BR208_Overview_EN.fm

										
IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 208 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 2 mm	392
 Non-embedded	0 4 mm	396



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	5 ... 20 %
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 5\%$
Indicators	Yellow LED (360° visible)	Switching state
Mechanical data	Standard target (Fe360)	8 x 8 (12 x 12) mm ²
	Weight (connector/cable)	Approx. 12g/70g
Environmental data	Ambient temperature	-25°C ... +70°C
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 3 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Mounting systems for this series can be found from page 643 onwards

Features

- Slim and short cylindrical metal housing M8 x 1
- Stainless steel housing
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state visible from 360°



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

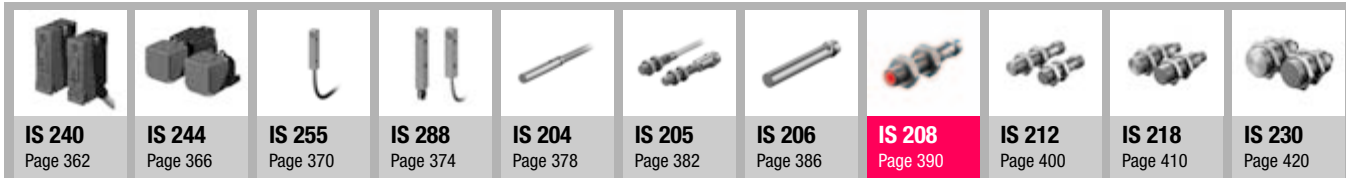
Protective
Sensors

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M8, embedded installation					
IS 208 MM/4NO - 1E5 50109639	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 208 MM/4NO - 1E5 - S8.3 50109640	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 208 MM/4NO - 1E5 - S12 50109641	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 208 MM/4NC - 1E5 50112444	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x PNP	NC (normally closed)
IS 208 MM/2NO - 1E5 50109642	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x NPN	NO (normally open)
IS 208 MM/2NC - 1E5 50113207	<input type="checkbox"/> 0 1.2 <input checked="" type="checkbox"/> 0 1.5	5000Hz	Embedded	1 x NPN	NC (normally closed)

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Accessories / connection cables		More accessories can be found from page 643 onwards	
Part no.	Designation	Features	
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC	
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC	
c 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC	
d 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
g 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, user-configurable	



IS 208 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

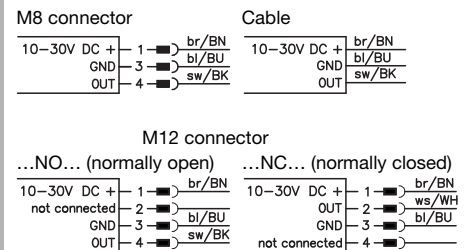
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Stainless steel / PA12	IP 67	
M8 connector	Stainless steel / PA12	IP 67	a, b, g
M12 connector	Stainless steel / PA12	IP 67	c, d, e, f
Cable, 2 m, PVC	Stainless steel / PA12	IP 67	
Cable, 2 m, PVC	Stainless steel / PA12	IP 67	
Cable, 2 m, PVC	Stainless steel / PA12	IP 67	



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection



...NO...-S12 (normally open):
3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):
only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M8, embedded installation					
IS 208 MM/4NO - 2EO 50109652	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 208 MM/4NO - 2EO - S8.3 50109653	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NO (normally open)
ISS 208 MM/4NO - 2EO - S8.3 ¹⁾ 50117201	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 208 MM/4NO - 2EO, 200 - S8.3 50114051	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NO (normally open)
ISS 208 MM/4NO - 2EO, 200 - S8.3 ¹⁾ 50118369	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NO (normally open)
IS 208 MM/4NC - 2EO 50113211	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NC (normally closed)
IS 208 MM/4NC - 2EO - S8.3 50109654	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1 x PNP	NC (normally closed)
IS 208 MM/2NO - 2EO 50109655	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1xNPN	NO (normally open)
IS 208 MM/2NO - 2EO - S8.3 50109656	<input type="checkbox"/> 0 1.6 <input type="checkbox"/> 0 2	5000Hz	Embedded	1xNPN	NO (normally open)

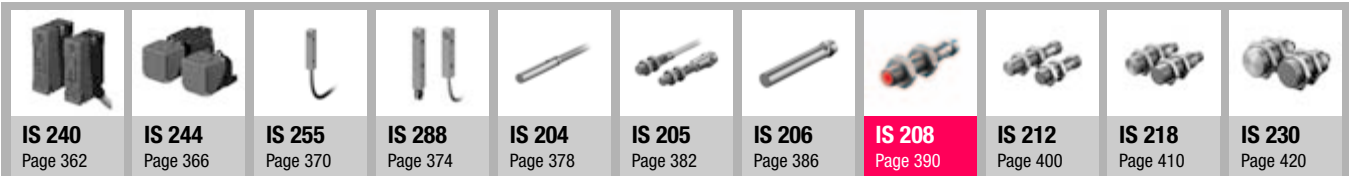
1) Short construction

We reserve the right to make changes • BR208_2_EN.fm

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104521	K - D M8W - 3P - 2m - PVC	Connection cable 2000mm, M8 angular, 3-pin, PVC
b 50104520	K - D M8A - 3P - 2m - PVC	Connection cable 2000mm, M8 axial, 3-pin, PVC
c 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
d 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
e 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, user-configurable



IS 208 SERIES

Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

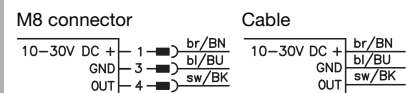
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Stainless steel / PA12	IP 67	
M8 connector	Stainless steel / PA12	IP 67	a, b, c, d, e
M8 connector	Stainless steel / PA12	IP 67	a, b, c, d, e
Cable, 0.2 m, with M8 connector	Stainless steel / PA12	IP 67	a, b, c, d, e
Cable, 0.2 m, with M8 connector	Stainless steel / PA12	IP 67	a, b, c, d, e
Cable, 2 m, PVC	Stainless steel / PA12	IP 67	
M8 connector	Stainless steel / PA12	IP 67	a, b, c, d, e
Cable, 2 m, PVC	Stainless steel / PA12	IP 67	
M8 connector	Stainless steel / PA12	IP 67	a, b, c, d, e



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection














INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M8, non-embedded installation					
IS 208 MM/4NO - 2N5 50109645	<input type="checkbox"/> 0 <input type="checkbox"/> 2 <input type="checkbox"/> 0 <input type="checkbox"/> 2.5	5000Hz	Non-embedded	1 x PNP	NO (normally open)
IS 208 MM/4NO - 2N5 - S8.3 50109646	<input type="checkbox"/> 0 <input type="checkbox"/> 2 <input type="checkbox"/> 0 <input type="checkbox"/> 2.5	5000Hz	Non-embedded	1 x PNP	NO (normally open)
ISS 208 MM/4NO - 2N5 - S8.3 ¹⁾ 50114490	<input type="checkbox"/> 0 <input type="checkbox"/> 2 <input type="checkbox"/> 0 <input type="checkbox"/> 2.5	5000Hz	Non-embedded	1 x PNP	NO (normally open)
IS 208 MM/4NO - 2N5 - S12 50109647	<input type="checkbox"/> 0 <input type="checkbox"/> 2 <input type="checkbox"/> 0 <input type="checkbox"/> 2.5	5000Hz	Non-embedded	1 x PNP	NO (normally open)
IS 208 MM/2NO - 2N5 50109649	<input type="checkbox"/> 0 <input type="checkbox"/> 2 <input type="checkbox"/> 0 <input type="checkbox"/> 2.5	5000Hz	Non-embedded	1 x NPN	NO (normally open)

1) Short construction

We reserve the right to make changes • BR208_3_EN.fm

Accessories / connection cables		More accessories can be found from page 643 onwards	
Part no.	Designation	Features	
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC	
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC	
c 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC	
d 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC	
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
g 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, user-configurable	

										
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IS 208 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
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Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

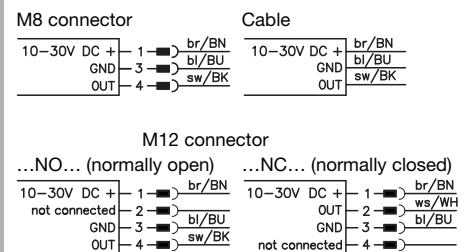
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2m, PVC	Stainless steel / PBTP	IP 67	
M8 connector	Stainless steel / PBTP	IP 67	a, b, g
M8 connector	Stainless steel / PBTP	IP 67	a, b, g
M12 connector	Stainless steel / PBTP	IP 67	c, d, e, f
Cable, 2m, PVC	Stainless steel / PBTP	IP 67	



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection



...NO...-S12 (normally open):
3-pin or 4-pin M12 connection cables can be used.











...NC...-S12 (normally closed):
only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M8, non-embedded installation					
IS 208 MM/4NO - 4NO 50109658	<input type="checkbox"/> 0 3.2 <input type="checkbox"/> 0 4	3500Hz	Non-embedded	1 x PNP	NO (normally open)
IS 208 MM/4NO - 4NO - S8.3 50109659	<input type="checkbox"/> 0 3.2 <input type="checkbox"/> 0 4	3500Hz	Non-embedded	1 x PNP	NO (normally open)
IS 208 MM/4NC - 4NO - S8.3 50109660	<input type="checkbox"/> 0 3.2 <input type="checkbox"/> 0 4	3500Hz	Non-embedded	1 x PNP	NC (normally closed)
IS 208 MM/2NO - 4NO 50109661	<input type="checkbox"/> 0 3.2 <input type="checkbox"/> 0 4	3500Hz	Non-embedded	1 x NPN	NO (normally open)
IS 208 MM/2NO - 4NO - S8.3 50109662	<input type="checkbox"/> 0 3.2 <input type="checkbox"/> 0 4	3500Hz	Non-embedded	1 x NPN	NO (normally open)

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Accessories / connection cables		More accessories can be found from page 643 onwards
Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
d 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
g 50104582	D M8A - 3P - SK	Cable socket, M8 axial, 3-pin, user-configurable

										
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IS 208 SERIES
Inductive Switches



Photoel. sensors/
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Switches

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Light
Curtains

Protective
Sensors

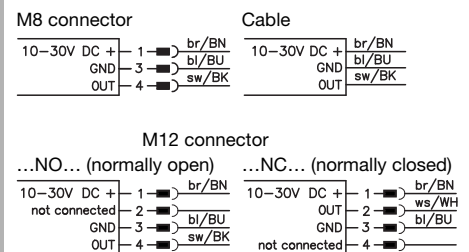
Connection	Material housing / active surface	Protection class	Accessories
Cable, 2m, PVC	Stainless steel / PBTP	IP 67	
M8 connector	Stainless steel / PBTP	IP 67	a, b, g
M8 connector	Stainless steel / PBTP	IP 67	a, b, g
Cable, 2m, PVC	Stainless steel / PBTP	IP 67	
M8 connector	Stainless steel / PBTP	IP 67	a, b, g



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

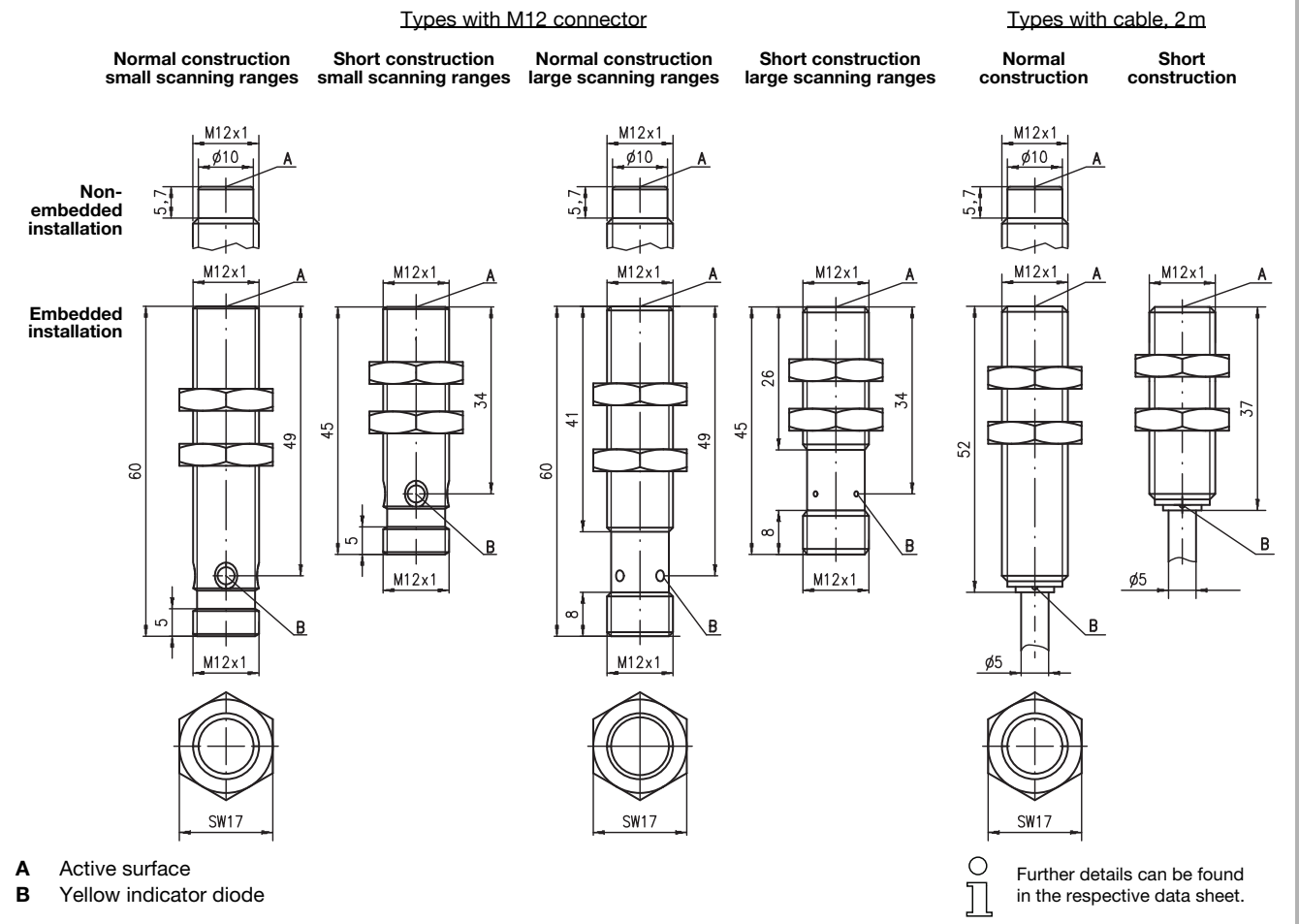


...NO...-S12 (normally open):
3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):
only 4-pin M12 connection cables can be used.

OVERVIEW



Dimensioned drawing



We reserve the right to make changes • BR212_Overview_EN.fm

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IS 212 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 6 mm	402
 Non-embedded	0 10 mm	408



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	0 ... 15%
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 5\%$
Indicators	Yellow LED (360° visible)	Switching state
Mechanical data	Standard target (Fe360)	12 x 12 (30 x 30) mm ²
	Weight (connector/cable)	Approx. 30g/95g
Environmental data	Ambient temperature	-25°C ... +70°C (+85°C)
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 3 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Mounting systems for this series can be found from page 632 onwards

Features

- Slim and short cylindrical metal housing M12 x 1
- Chromium-plated brass housing
- Food+Beverage version in stainless steel AISI 316L (DIN 1.4404) up to +85°C
- Extra short construction available
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state visible from 360°



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
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Sensors

Inductive
Switches

Forked
Sensors





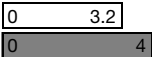
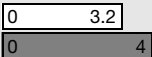
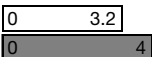
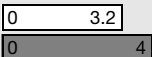
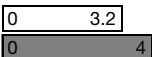
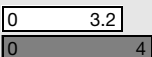
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

INDUCTIVE SWITCHES












Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M12, embedded installation					
IS 212 MM/4NO - 2E0 50109664		3000Hz	Embedded	1 x PNP	NO (normally open)
IS 212 MM/4NO - 2E0 - S12 50109665		3000Hz	Embedded	1 x PNP	NO (normally open)
IS 212 MM/4NC - 2E0 - S12 50111870		3000Hz	Embedded	1 x PNP	NC (normally closed)
IS 212 MM/2NO - 2E0 50109666		3000Hz	Embedded	1 x NPN	NO (normally open)
IS 212 MM/4NO - 4E0 50109672		2000Hz	Embedded	1 x PNP	NO (normally open)
IS 212 MM/4NO - 4E0 - S12 50109673		2000Hz	Embedded	1 x PNP	NO (normally open)
ISS 212 MM/4NO - 4E0 ¹⁾ 50109684		2000Hz	Embedded	1 x PNP	NO (normally open)
ISS 212 MM/4NO - 4E0 - S12 ¹⁾ 50109685		2000Hz	Embedded	1 x PNP	NO (normally open)
IS 212 MM/4NC - 4E0 - S12 50109674		2000Hz	Embedded	1 x PNP	NC (normally closed)
ISS 212 MM/4NC - 4E0 - S12 ¹⁾ 50109676		2000Hz	Embedded	1 x PNP	NC (normally closed)

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable
f 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

We reserve the right to make changes • BR212_1_EN.fm

										
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IS 212 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d, e, f
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d, e, f

1) Short construction

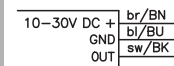


Inductive Switch

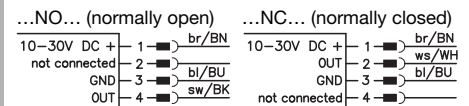
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

Cable



M12 connector



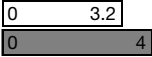
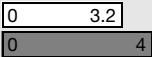
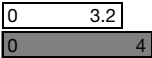

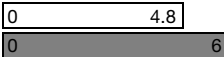



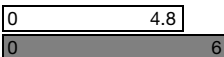
...NO...-S12 (normally open):

3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):

only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES












Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M12, embedded installation					
IS 212 MM/2NO - 4EO 50109675		2000Hz	Embedded	1 x NPN	NO (normally open)
ISS 212 MM/2NO - 4EO - S12 ¹⁾ 50109687		2000Hz	Embedded	1 x NPN	NO (normally open)
IS 212 MM/2NC - 4EO 50114380		2000Hz	Embedded	1 x NPN	NC (normally closed)
IS 212 MM/4NO - 6EO 50109678		800Hz	Embedded	1 x PNP	NO (normally open)
ISS 212 MM/4NO - 6EO - S12 ¹⁾ 50109679		800Hz	Embedded	1 x PNP	NO (normally open)
IS 212 MM/2NO - 6EO 50109682		800Hz	Embedded	1 x NPN	NO (normally open)
ISS 212 MM/2NO - 6EO - S12 ¹⁾ 50109688		800Hz	Embedded	1 x NPN	NO (normally open)
IS 212 FM/4NO.5F - 6EO - S12 ²⁾ 50109736		600Hz	Embedded	1 x PNP	NO (normally open)
IS 212 FM/4NO.5W - 6EO - S12 ³⁾ 50117127		15Hz	Embedded	1 x PNP	NO (normally open)

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.
g 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable
h 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

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IS 212 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, g, h
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, g, h
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, g, h
M12 connector	Stainless steel AISI 316L (DIN 1.4404) / stainless steel AISI 316L (DIN 1.4404)	IP 67, IP 69K	e, f
M12 connector	Stainless steel AISI 303L (DIN 1.4305) / stainless steel AISI 303L (DIN 1.4305)	IP 67, IP 69K	a, b, g, h

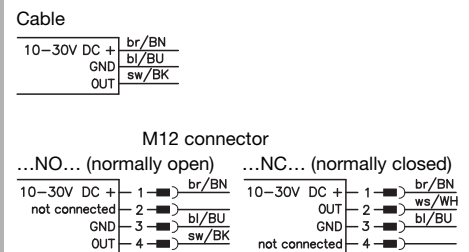
- 1) Short construction
- 2) Food + Beverage version for the food and beverage industries
- 3) Version for welding applications, resistant to electromagnetic fields and welding sparks



Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection



...NO...-S12 (normally open):
3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):
only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M12, non-embedded installation					
IS 212 MM/4NO - 4NO 50109668		2000Hz	Non-embedded	1 x PNP	NO (normally open)
IS 212 MM/4NO - 4NO - S12 50109669		2000Hz	Non-embedded	1 x PNP	NO (normally open)
ISS 212 MM/4NO - 4NO - S12 ¹⁾ 50111963		2000Hz	Non-embedded	1 x PNP	NO (normally open)
IS 212 MM/4NC - 4NO - S12 50112914		2000Hz	Non-embedded	1 x PNP	NC (normally closed)
IS 212 MM/2NO - 4NO 50109670		2000Hz	Non-embedded	1xNPN	NO (normally open)
ISS 212 MM/2NO - 4NO ¹⁾ 50112209		2000Hz	Non-embedded	1xNPN	NO (normally open)
IS 212 MM/4NO - 8NO 50112807		1500Hz	Non-embedded	1 x PNP	NO (normally open)
IS 212 MM/4NO - 8NO - S12 50112808		1500Hz	Non-embedded	1 x PNP	NO (normally open)
IS 212 MM/2NO - 8NO 50112806		1500Hz	Non-embedded	1xNPN	NO (normally open)
IS 212 MM/2NO - 8NO - S12 50120274		1500Hz	Non-embedded	1xNPN	NO (normally open)

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable
f 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

We reserve the right to make changes • BR212_3_EN.fm

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IS 212 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f

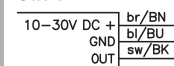


Inductive Switch

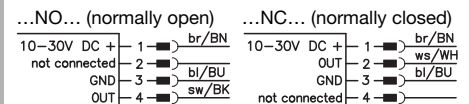
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

Cable



M12 connector



...NO...-S12 (normally open):

3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):

only 4-pin M12 connection cables can be used.

1) Short construction

INDUCTIVE SWITCHES

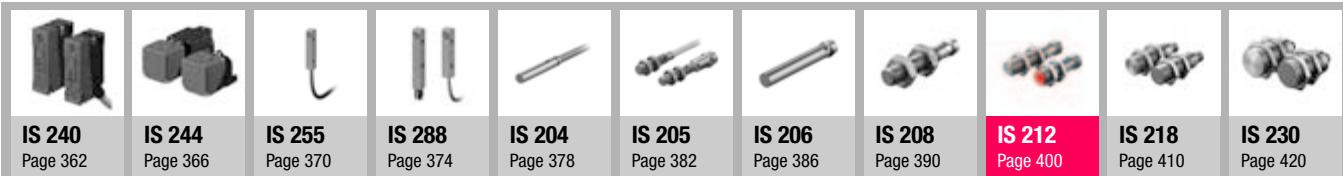
Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M12, non-embedded installation					
IS 212 MM/4NO - 10N 50109689		400Hz	Non-embedded	1 x PNP	NO (normally open)
ISS 212 MM/4NO - 10N - S12 ¹⁾ 50109680		400Hz	Non-embedded	1 x PNP	NO (normally open)
IS 212 MM/4NC - 10N - S12 50114052		400Hz	Non-embedded	1 x PNP	NC (normally closed)
IS 212 MM/2NO - 10N 50111952		400Hz	Non-embedded	1 x NPN	NO (normally open)
IS 212 FM/4NO.5F - 10N - S12 ²⁾ 50109738		400Hz	Non-embedded	1 x PNP	NO (normally open)

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.
g 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable
h 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

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IS 212 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, g, h
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d, g, h
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Stainless steel AISI 316L (DIN 1.4404) / stainless steel AISI 316L (DIN 1.4404)	IP 67, IP 69K	e, f

- 1) Short construction
- 2) Food + Beverage version for the food and beverage industries

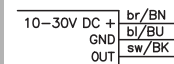


Inductive Switch

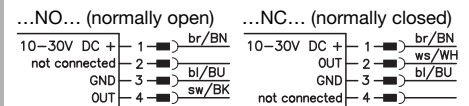
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

Cable



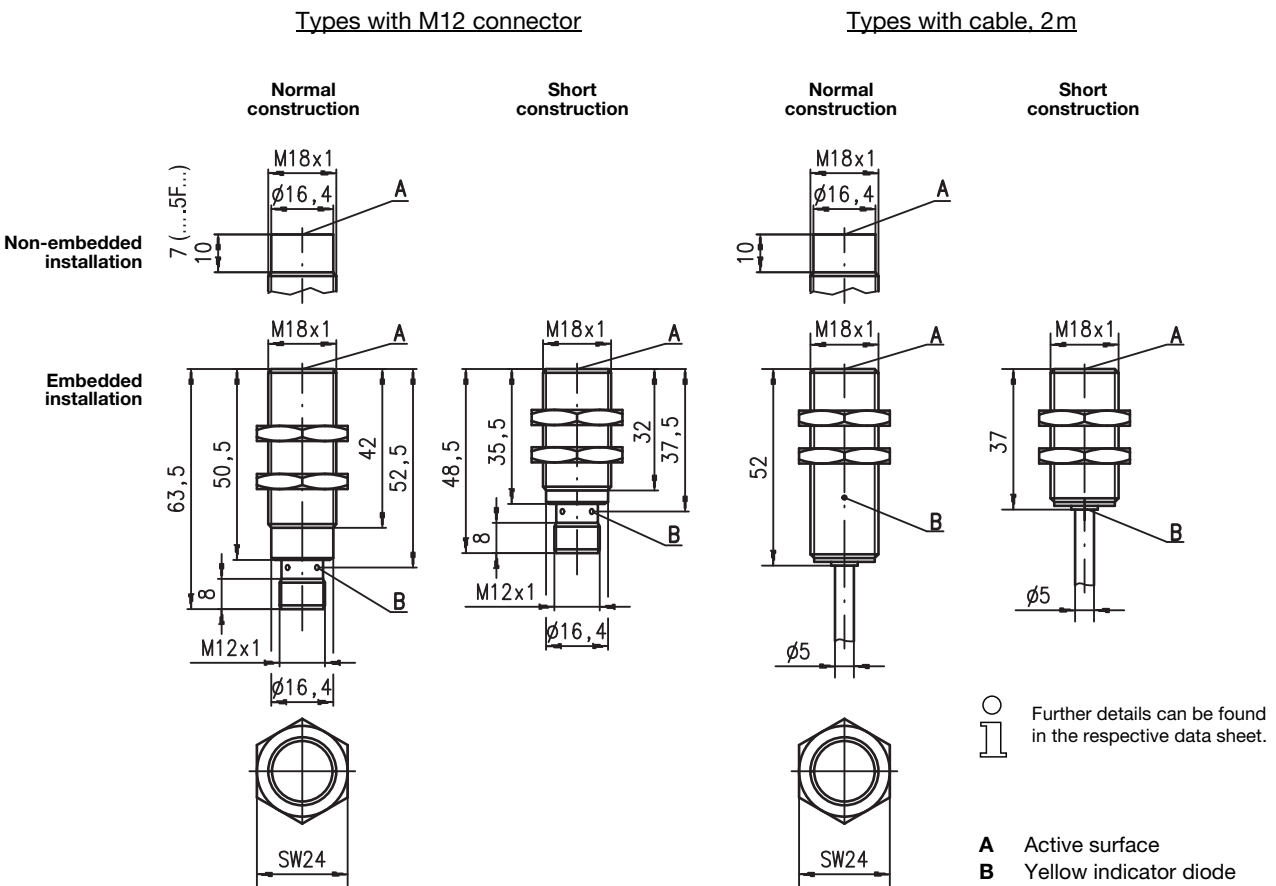
M12 connector



- ...NO...-S12 (normally open):
3-pin or 4-pin M12 connection cables can be used.
- ...NC...-S12 (normally closed):
only 4-pin M12 connection cables can be used.

OVERVIEW



Dimensioned drawing



We reserve the right to make changes • BR218_Overview_EN.fm

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IS 218 SERIES



Installation	Typ. scan range limit S_n	Page
 Embedded	0 12 mm	412
 Non-embedded	0 20 mm	418



Common technical data		
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	0 ... 15%
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 5\%$
Indicators	Yellow LED (360° visible)	Switching state
Mechanical data	Standard target (Fe360)	18 x 18 (60 x 60) mm ²
	Weight (connector/cable)	Approx. 50g/165g
Environmental data	Ambient temperature	-25°C ... +70°C (+85°C)
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 3 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3
Mounting systems for this series can be found from page 630 onwards		

Features

- Slim and short cylindrical metal housing M18 x 1
- Chromium-plated brass housing
- Food+Beverage version in stainless steel AISI 316L (DIN 1.4404) up to +85°C
- Extra short construction available
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state visible from 360°

Inductive Switch

● Functionality	P. 700
● Outputs / Switching functions	P. 701
● Mounting / Installation	P. 702
● Characteristic values	P. 703

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains












Protective
Sensors

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M18, embedded installation					
IS 218 MM/4NO - 5E0 50109692	<input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5	2000Hz	Embedded	1 x PNP	NO (normally open)
IS 218 MM/4NC - 5E0 50118521	<input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5	2000Hz	Embedded	1 x PNP	NC (normally closed)
IS 218 MM/4NO - 5E0 - S12 50109693	<input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5	2000Hz	Embedded	1 x PNP	NO (normally open)
ISS 218 MM/4NO - 5E0 ¹⁾ 50112915	<input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5	2000Hz	Embedded	1 x PNP	NO (normally open)
ISS 218 MM/4NO - 5E0 - S12 ¹⁾ 50112293	<input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5	2000Hz	Embedded	1 x PNP	NO (normally open)
IS 218 MM/2NO - 5E0 50109694	<input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5	2000Hz	Embedded	1xNPN	NO (normally open)

We reserve the right to make changes • BR218_1_EN.fm

Accessories / connection cables		More accessories can be found from page 643 onwards	
Part no.	Designation	Features	
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC	
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable	
f 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable	

										
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IS 218 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	



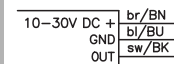
Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

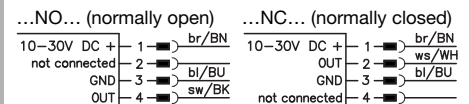
1) Short construction

Electrical connection

Cable



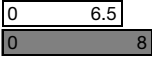
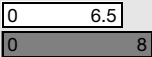
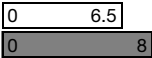
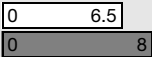
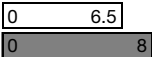
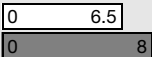
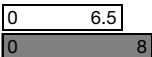
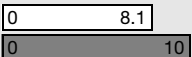
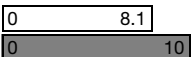
M12 connector



...NO...-S12 (normally open):
3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):
only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES












Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M18, embedded installation					
IS 218 MM/4NO - 8EO 50109700		1500Hz	Embedded	1 x PNP	NO (normally open)
IS 218 MM/4NO - 8EO - S12 50109701		1500Hz	Embedded	1 x PNP	NO (normally open)
ISS 218 MM/4NO - 8EO - S12 ¹⁾ 50111743		1500Hz	Embedded	1 x PNP	NO (normally open)
IS 218 MM/4NC - 8EO - S12 50109702		1500Hz	Embedded	1 x PNP	NC (normally closed)
IS 218 MM/2NO - 8EO 50112104		1500Hz	Embedded	1xNPN	NO (normally open)
IS 218 MM/2NO - 8EO - S12 50109704		1500Hz	Embedded	1xNPN	NO (normally open)
ISS 218 MM/2NO - 8EO - S12 ¹⁾ 50109703		1500Hz	Embedded	1xNPN	NO (normally open)
IS 218 FM/4NO.5F - 10E - S12 ²⁾ 50109732		300Hz	Embedded	1 x PNP	NO (normally open)
IS 218 FM/4NO.5W - 10E - S12 ³⁾ 50117128		15Hz	Embedded	1 x PNP	NO (normally open)

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.
g 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable
h 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

We reserve the right to make changes • BR218_2_EN.fm

										
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IS 218 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d, g, h
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d, g, h
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d, g, h
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d, g, h
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d, g, h
M12 connector	Stainless steel AISI 316L (DIN 1.4404) / stainless steel AISI 316L (DIN 1.4404)	IP 67, IP 69K	e, f
M12 connector	Stainless steel AISI 303L (DIN 1.4305) / stainless steel AISI 303L (DIN 1.4305)	IP 67, IP 69K	a, b, c, d, g, h

- 1) Short construction
- 2) Food + Beverage version for the food and beverage industries
- 3) Version for welding applications, resistant to electromagnetic fields and welding sparks

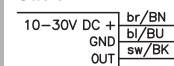


Inductive Switch

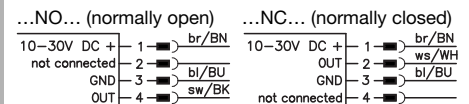
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

Cable



M12 connector



...NO...-S12 (normally open):

3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):












only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M18, embedded installation					
IS 218 MM/4NO - 12E 50109706	<input type="checkbox"/> 9.7 <input checked="" type="checkbox"/> 12	500Hz	Embedded	1 x PNP	NO (normally open)
IS 218 MM/4NO - 12E - S12 50114427	<input type="checkbox"/> 9.7 <input checked="" type="checkbox"/> 12	500Hz	Embedded	1 x PNP	NO (normally open)
ISS 218 MM/4NO - 12E - S12 ¹⁾ 50109707	<input type="checkbox"/> 9.7 <input checked="" type="checkbox"/> 12	500Hz	Embedded	1 x PNP	NO (normally open)
ISS 218 MM/4NC - 12E - S12 ¹⁾ 50120273	<input type="checkbox"/> 9.7 <input checked="" type="checkbox"/> 12	500Hz	Embedded	1 x PNP	NC (normally closed)
IS 218 MM/2NO - 12E 50111954	<input type="checkbox"/> 9.7 <input checked="" type="checkbox"/> 12	500Hz	Embedded	1 x NPN	NO (normally open)
ISS 218 MM/2NO - 12E - S12 ¹⁾ 50109708	<input type="checkbox"/> 9.7 <input checked="" type="checkbox"/> 12	500Hz	Embedded	1 x NPN	NO (normally open)

We reserve the right to make changes • BR218_3_EN.fm

Accessories / connection cables		More accessories can be found from page 643 onwards	
Part no.	Designation	Features	
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC	
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC	
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC	
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC	
e 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable	
f 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable	

										
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IS 218 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f



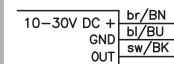
Inductive Switch

- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

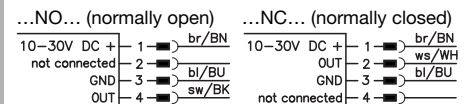
1) Short construction

Electrical connection

Cable



M12 connector



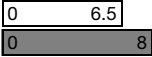
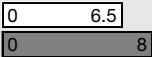
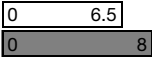
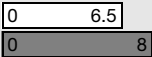
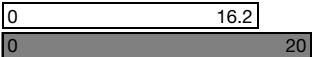



...NO...-S12 (normally open):

3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):

only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M18, non-embedded installation					
IS 218 MM/4NO - 8NO 50109696		2000Hz	Non-embedded	1 x PNP	NO (normally open)
IS 218 MM/4NO - 8NO - S12 50109697		2000Hz	Non-embedded	1 x PNP	NO (normally open)
IS 218 MM/2NO - 8NO 50109698		2000Hz	Non-embedded	1 x NPN	NO (normally open)
IS 218 MM/2NO - 8NO - S12 50109699		2000Hz	Non-embedded	1 x NPN	NO (normally open)
IS 218 MM/4NO - 20N 50109709		200Hz	Non-embedded	1 x PNP	NO (normally open)
ISS 218 MM/4NO - 20N - S12 ¹⁾ 50109710		200Hz	Non-embedded	1 x PNP	NO (normally open)
IS 218 MM/2NO - 20N 50111953		200Hz	Non-embedded	1 x NPN	NO (normally open)
IS 218 FM/4NO.5F - 20N - S12 ²⁾ 50109734		200Hz	Non-embedded	1 x PNP	NO (normally open)

1) Short construction












2) Food + Beverage version for the food and beverage industries

We reserve the right to make changes • BR218_4_EN.fm

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
c 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
d 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.
e 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable
f 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

										
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IS 218 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Stainless steel AISI 316L (DIN 1.4404) / stainless steel AISI 316L (DIN 1.4404)	IP 67, IP 69K	c, d

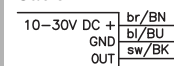


Inductive Switch

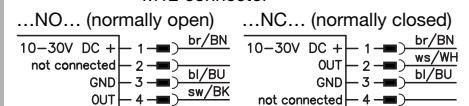
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

Cable



M12 connector

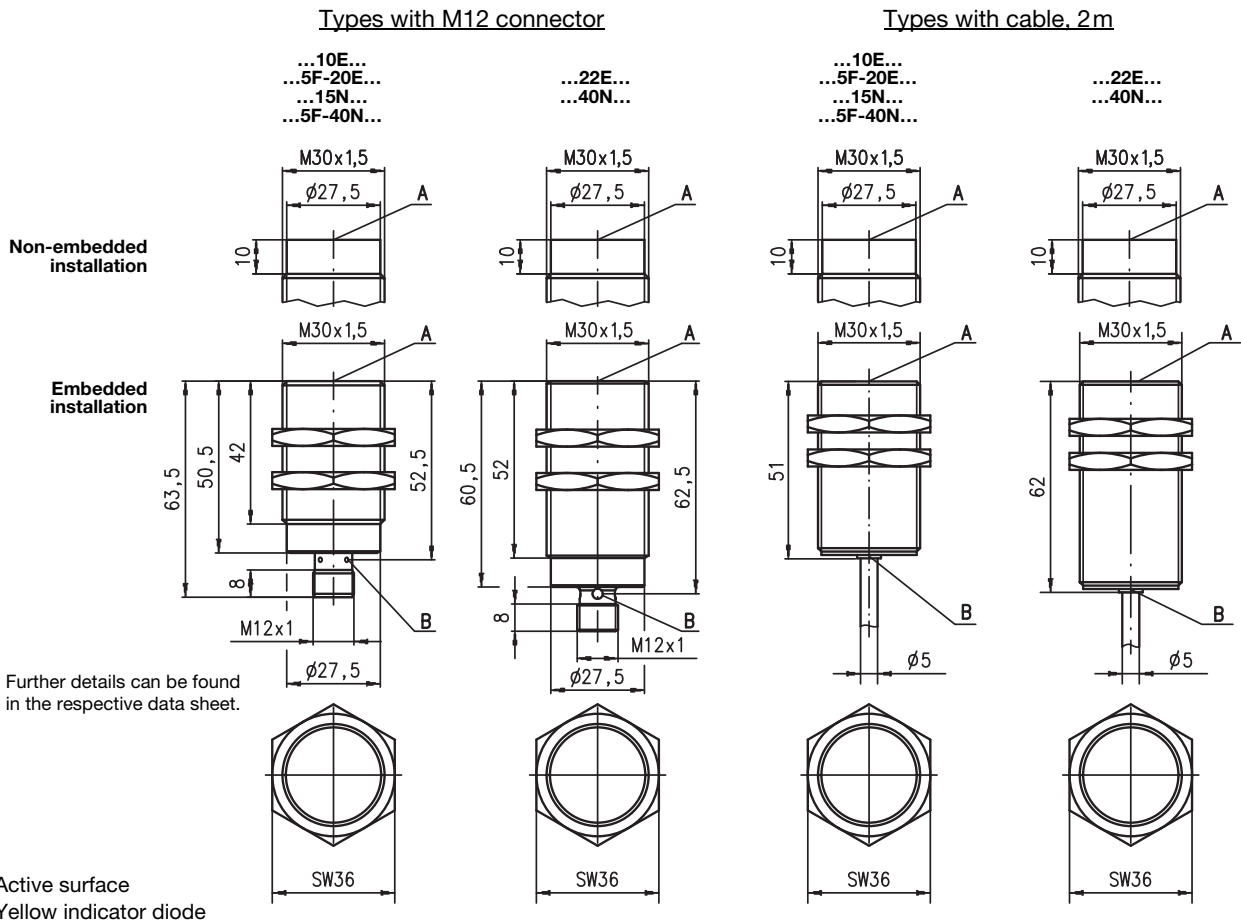


...NO...-S12 (normally open):
3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):
only 4-pin M12 connection cables can be used.

OVERVIEW



Dimensioned drawing



We reserve the right to make changes • BR230_Overview_EN.fm

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IS 230 SERIES

Installation	Typ. scan range limit S_n	Page
 Embedded	0 22 mm	422
 Non-embedded	0 40 mm	424



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple σ	$\leq 20\%$ of U_B
	Output current I_L	≤ 200 mA
	Residual current I_r	≤ 100 μ A
	Voltage drop U_d	≤ 2.0 V
	Hysteresis H of S_r	0 ... 15%
	Temperature drift of S_r	$\leq 10\%$ (entire temp. range)
	Repeatability	$\leq 5\%$
Indicators	Yellow LED (360° visible)	Switching state
Mechanical data	Standard target (Fe360)	30x30 (120x120) mm ²
	Weight (connector/cable)	Approx. 155g/210g
Environmental data	Ambient temperature	-25°C ... +70°C (+85°C)
	Protective circuit	Polarity reversal protection, short circuit prot., inductive prot.
	Standards applied	IEC 60947-5-2, UL 508
	Electromagnetic compatibility	IEC 60255-5 1 kV IEC 61000-4-2 Level 3 IEC 61000-4-3 Level 3 IEC 61000-4-4 Level 3

Mounting systems for this series can be found from page 632 onwards

Features

- Slim and short cylindrical metal housing M30 x 1
- Chromium-plated brass housing
- Food+Beverage version in stainless steel AISI 316L (DIN 1.4404) up to +85°C
- Built-in short circuit protection, inductive protection, polarity reversal protection
- LED for switching state visible from 360°



Inductive Switch

- | | |
|---------------------------------|--------|
| ● Functionality | P. 700 |
| ● Outputs / Switching functions | P. 701 |
| ● Mounting / Installation | P. 702 |
| ● Characteristic values | P. 703 |

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

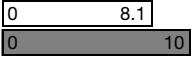

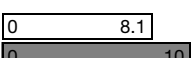
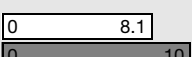
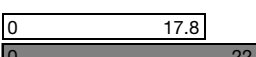



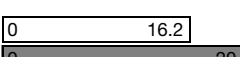
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

INDUCTIVE SWITCHES

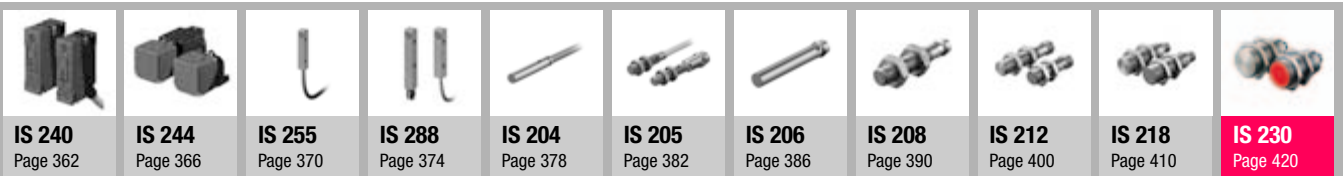
Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M30, embedded installation					
IS 230 MM/4NO - 10E 50109712		1200Hz	Embedded	1 x PNP	NO (normally open)
IS 230 MM/4NO - 10E - S12 50109713		1200Hz	Embedded	1 x PNP	NO (normally open)
IS 230 MM/4NC - 10E - S12 50111871		1200Hz	Embedded	1 x PNP	NC (normally closed)
IS 230 MM/2NO - 10E 50109714		1200Hz	Embedded	1xNPN	NO (normally open)
IS 230 MM/4NO - 22E 50109720		200Hz	Embedded	1 x PNP	NO (normally open)
IS 230 MM/4NO - 22E - S12 50109721		200Hz	Embedded	1 x PNP	NO (normally open)
IS 230 MM/4NC - 22E - S12 50109722		200Hz	Embedded	1 x PNP	NC (normally closed)
IS 230 MM/2NO - 22E 50109723		200Hz	Embedded	1xNPN	NO (normally open)
IS 230 FM/4NO.5F - 20E - S12¹⁾ 50111435		100Hz	Embedded	1 x PNP	NO (normally open)

1) Food + Beverage version for the food and beverage industries

We reserve the right to make changes • BR230_1_EN.fm

Accessories / connection cables More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
f 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.



IS 230 SERIES
Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, c, d
M12 connector	Brass, chromium-plated / PBTP	IP 67	c, d
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Stainless steel AISI 316L (DIN 1.4404) / stainless steel AISI 316L (DIN 1.4404)	IP 67, IP 69K	e, f

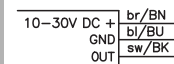


Inductive Switch

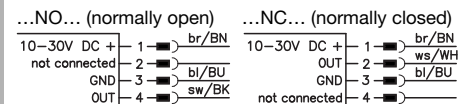
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

Cable



M12 connector



...NO...-S12 (normally open):

3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):

only 4-pin M12 connection cables can be used.

INDUCTIVE SWITCHES

Part description Part No.:	Scanning range S_a [mm] <input type="checkbox"/> Typ. scan range limit S_n [mm] <input type="checkbox"/>	Switching frequency	Installation	Output	Switching
Inductive switches M30, non-embedded installation					
IS 230 MM/4NO - 15N 50109716	<input type="checkbox"/> 0 12.1 <input type="checkbox"/> 0 15	700Hz	Non-embedded	1 x PNP	NO (normally open)
IS 230 MM/4NO - 15N - S12 50109717	<input type="checkbox"/> 0 12.1 <input type="checkbox"/> 0 15	700Hz	Non-embedded	1 x PNP	NO (normally open)
IS 230 MM/2NO - 15N 50109718	<input type="checkbox"/> 0 12.1 <input type="checkbox"/> 0 15	700Hz	Non-embedded	1 x NPN	NO (normally open)
IS 230 MM/2NO - 15N - S12 50109719	<input type="checkbox"/> 0 12.1 <input type="checkbox"/> 0 15	700Hz	Non-embedded	1 x NPN	NO (normally open)
IS 230 MM/4NO - 40N 50109726	<input type="checkbox"/> 0 32.4 <input type="checkbox"/> 0 40	100Hz	Non-embedded	1 x PNP	NO (normally open)
IS 230 MM/4NO - 40N - S12 50109727	<input type="checkbox"/> 0 32.4 <input type="checkbox"/> 0 40	100Hz	Non-embedded	1 x PNP	NO (normally open)
IS 230 MM/2NO - 40N 50109728	<input type="checkbox"/> 0 32.4 <input type="checkbox"/> 0 40	100Hz	Non-embedded	1 x NPN	NO (normally open)
IS 230 FM/4NO.5F - 40N - S12 ¹⁾ 50111436	<input type="checkbox"/> 0 32.4 <input type="checkbox"/> 0 40	90Hz	Non-embedded	1 x PNP	NO (normally open)












1) Food + Beverage version for the food and beverage industries

We reserve the right to make changes • BR230_2_EN.fm

Accessories / connection cables

More accessories can be found from **page 643** onwards

Part no.	Designation	Features
a 50104541	K - D M12W - 3P - 5m - PVC	Connection cable 5000mm, M12 angular, 3-pin, PVC
b 50104540	K - D M12A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
c 50104573	K - D M12W - 4P - 5m - FAB	Connection cable 5000mm, M12 angular, 4-pin, Food+Bev.
d 50104572	K - D M12A - 4P - 5m - FAB	Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.
e 50031324	KD 095 - 4	Cable socket, M12 angular, 4-pin, user-configurable
f 50031323	KD 095 - 4A	Cable socket, M12 axial, 4-pin, user-configurable

										
IS 240 Page 362	IS 244 Page 366	IS 255 Page 370	IS 288 Page 374	IS 204 Page 378	IS 205 Page 382	IS 206 Page 386	IS 208 Page 390	IS 212 Page 400	IS 218 Page 410	IS 230 Page 420

IS 230 SERIES

Inductive Switches



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Material housing / active surface	Protection class	Accessories
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Brass, chromium-plated / PBTP	IP 67	a, b, e, f
Cable, 2 m, PVC	Brass, chromium-plated / PBTP	IP 67	
M12 connector	Stainless steel AISI 316L (DIN 1.4404) / stainless steel AISI 316L (DIN 1.4404)	IP 67, IP 69K	c, d

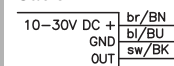


Inductive Switch

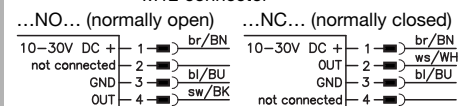
- Functionality P. 700
- Outputs / Switching functions P. 701
- Mounting / Installation P. 702
- Characteristic values P. 703

Electrical connection

Cable



M12 connector



...NO...-S12 (normally open):

3-pin or 4-pin M12 connection cables can be used.

...NC...-S12 (normally closed):

only 4-pin M12 connection cables can be used.



SELECTION GUIDE

Forked sensors for detecting small parts

Application



Detection of small parts in a feed system

Products and mouth widths [mm]



GS 04 from **page 428** onwards
Mouth widths: **20 / 30 / 50 / 80 / 120 / 220**



GSL 04 from **page 428** onwards
Mouth widths: **30 / 50 / 80**



GS 21 from **page 428** onwards
Mouth widths: **8**

FORKED SENSORS





Forked sensors for detecting labels

Application



Detection of paper, transparent or metalized labels

Products and mouth widths [mm]

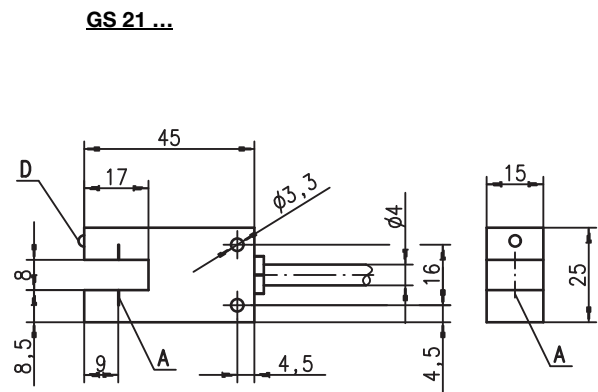
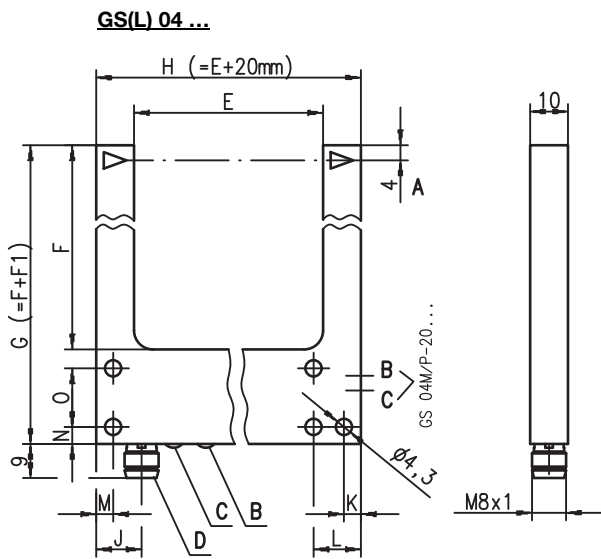
	GS 61/(I)GS 63 Mouth widths: 3	from page 434 onwards
	GK 14 Mouth widths: 0.9	from page 446 onwards
	GSU 06 Mouth widths: 2.5	from page 450 onwards
	GSU 14C Mouth widths: 4	from page 450 onwards


Using the sensors with different label materials

Sensors	Base material	Label material		
		PAPER	TRANSPARENT	METALIZED
Optical forked sensors GS 61, (I)GS 63	PAPER	●		
	TRANSPARENT	●		
Capacitive forked sensors GK 14	PAPER	●	●	
	TRANSPARENT	●	●	
Ultrasonic forked sensors GSU 06, GSU 14C	PAPER	●	●	●
	TRANSPARENT	●	●	●

OVERVIEW OF OPTICAL FORKED SENSORS

Dimensioned drawing



 Further details can be found in the respective data sheet.




	E Mw	F Mt	F1	G	H	J	K	L	M	N	O
GS 04M/P-20...	20	24	25	49	40	6	4.5	12.5	-	4.5	-
GS(L) 04M/P-30...	30	34	25	59	50	12	4.5	12.5	4.5	4.5	-
GS(L) 04M/P-50...	50	54	25	79	70	12	4.5	12.5	4.5	4.5	-
GS(L) 04M/P-80...	80	54	25	79	100	12	4.5	12.5	4.5	4.5	-
GS 04M/P-120...	120	54	30	84	140	37	-	18	22	5	20
GS 04M/P-220...	220	114	30	144	240	37	-	18	22	5	20

- A** Optical axis
- B** Sensitivity adjustment
- C** Light/dark switching
- D** Indicator diode




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GS 04/21 Page 428	GS 61/63 Page 434	GK 14 Page 446	GSU 06/14C Page 450

GS(L) 04 / GS 21

Optical forked sensors	Mouth widths	Page
 Optical forked sensors GS 04	20 / 30 / 50 / 80 / 120 / 220mm	430
 Optical laser forked sensors GSL 04	30 / 50 / 80 / 120mm	432
 Optical forked sensors GS 21	8mm	432

Additional products - forked sensors:

 Optical forked sensors	GS 61, (I)GS 63	434
 Capacitive forked sensors	GK 14	446
 Ultrasonic forked sensors	GSU 06, GSU 14C	450

Common technical data

Electrical data	Operating voltage U_B	GS(L) 04: 10 ... 30VDC GS 21: 24VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA} / \leq 90\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Red LED	Switching output
Mechanical data	Housing GS(L) 04	Diecast zinc
	Housing GS 21	Aluminum, anodized
	Optics cover	Glass
	Weight	28g ... 220g
Environmental data	Ambient temperature (operation)	GS 04: $-10^\circ\text{C} \dots +60^\circ\text{C}$ GS 21: $-20^\circ\text{C} \dots +60^\circ\text{C}$
	VDE safety class	III
	Protection class	IP 67
	Standards applied	IEC 60947-5-2, UL 508



Features

- Sensitivity adjustment and light/dark switching on rear side of fork
- Visible red light and laser
- All common mouth widths



Optical Sensor

- Throughbeam sensors Page 689

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OPTICAL FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency	Light source	Output	Switching	Response time
Optical forked sensors						
GS 04 M/P - 20 - S8 50110792	20	1500Hz	Red light	PNP	Light/dark reversible	0.33ms
GS 04 M/P - 30 - S8 50110782	30	1500Hz	Red light	PNP	Light/dark reversible	0.33ms
GS 04 M/N - 30 - S8 50110791	30	1500Hz	Red light	NPN	Light/dark reversible	0.33ms
GS 04 M/P - 50 - S8 50110783	50	1500Hz	Red light	PNP	Light/dark reversible	0.33ms
GS 04 M/N - 50 - S8 50110789	50	1500Hz	Red light	NPN	Light/dark reversible	0.33ms
GS 04 M/P - 80 - S8 50110784	80	1500Hz	Red light	PNP	Light/dark reversible	0.33ms
GS 04 M/N - 80 - S8 50110790	80	1500Hz	Red light	NPN	Light/dark reversible	0.33ms
GS 04 M/P - 120 - S8 50110785	120	1500Hz	Red light	PNP	Light/dark reversible	0.33ms
GS 04 M/N - 120 - S8 50110787	120	1500Hz	Red light	NPN	Light/dark reversible	0.33ms
GS 04 M/P - 220 - S8 50110786	220	1500Hz	Red light	PNP	Light/dark reversible	0.33ms
GS 04 M/N - 220 - S8 50110788	220	1500Hz	Red light	NPN	Light/dark reversible	0.33ms

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104521	K - D M8W - 3P - 2m - PVC	Connection cable 2000mm, M8 angular, 3-pin, PVC
b 50104520	K - D M8A - 3P - 2m - PVC	Connection cable 2000mm, M8 axial, 3-pin, PVC
c 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
d 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC

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GS 04
Optical forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

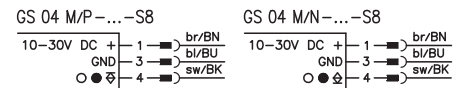
Repeatability	Connection	Option	Accessories
0.02mm	M8 connector	1, 2	a, b, c, d
0.02mm	M8 connector	1, 2	a, b, c, d
0.02mm	M8 connector	1, 2	a, b, c, d
0.04mm	M8 connector	1, 2	a, b, c, d
0.04mm	M8 connector	1, 2	a, b, c, d
0.06mm	M8 connector	1, 2	a, b, c, d
0.06mm	M8 connector	1, 2	a, b, c, d
0.08mm	M8 connector	1, 2	a, b, c, d
0.08mm	M8 connector	1, 2	a, b, c, d
0.08mm	M8 connector	1, 2	a, b, c, d
0.08mm	M8 connector	1, 2	a, b, c, d



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 UL approval (class 2 acc. to NEC)

OPTICAL FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency	Light source	Output	Switching	Response time
Optical forked sensors						
GSL 04 M/P - 30 - S8 50110793	30	5000Hz	Red light laser class 1	PNP	Light/dark reversible	0.1 ms
GSL 04 M/P - 50 - S8 50110794	50	5000Hz	Red light laser class 1	PNP	Light/dark reversible	0.1 ms
GSL 04 M/P - 80 - S8 50110795	80	5000Hz	Red light laser class 1	PNP	Light/dark reversible	0.1 ms
GS 21 / 4 G, 5000 50013967	8	1000Hz	Infrared light	PNP	Light	0.5 ms

Accessories / connection cables

 More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104521	K - D M8W - 3P - 2m - PVC	Connection cable 2000mm, M8 angular, 3-pin, PVC
b 50104520	K - D M8A - 3P - 2m - PVC	Connection cable 2000mm, M8 axial, 3-pin, PVC
c 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
d 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC



GSL 04 / GS 21

Optical forked sensors



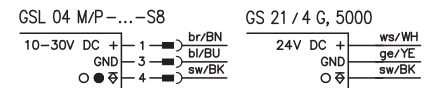
Repeatability	Connection	Option	Accessories
0.010mm	M8 connector	1, 3	a, b, c, d
0.010mm	M8 connector	1, 3	a, b, c, d
0.010mm	M8 connector	1, 3	a, b, c, d
	Cable, 5m		



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694
- Sensors w. laser transmitter Page 695

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transparent objects
- 3 UL approval (class 2 acc. to NEC)

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

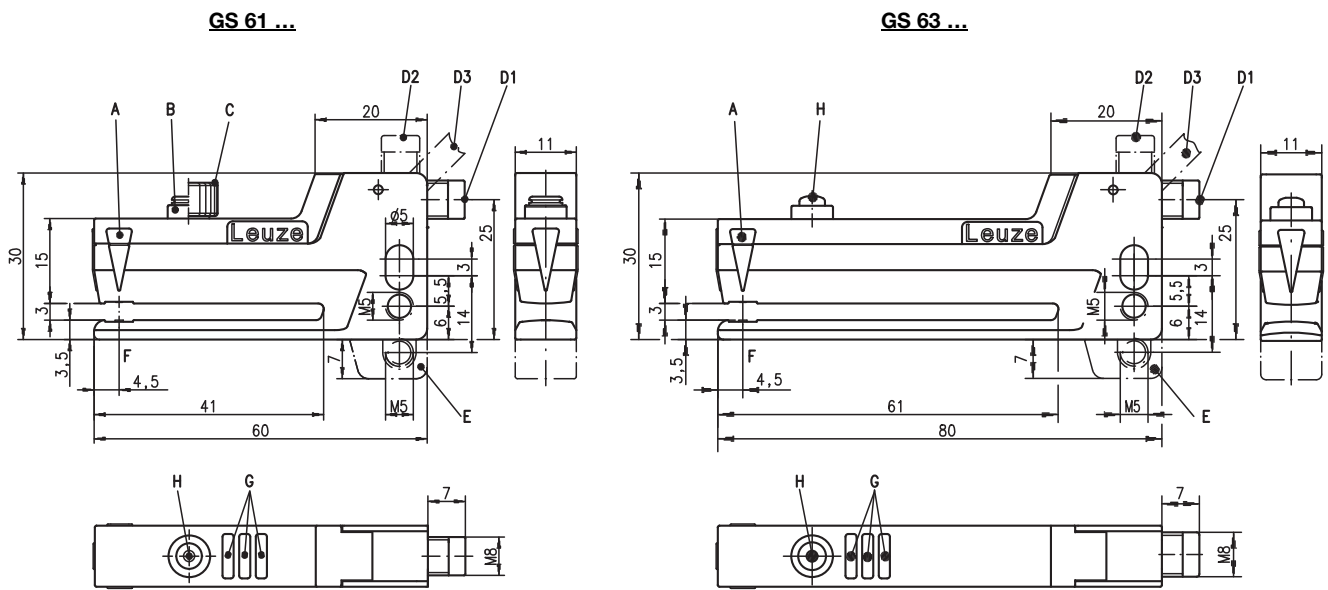
Light
Curtains

Protective
Sensors

www.leuze.com/en/forked-sensors/

OVERVIEW OF OPTICAL FORKED SENSORS

Dimensioned drawing





- A** Label center position
- B** Control element
- C** Knurled knob (removable)
- D** D1: horizontal connector, D2: vertical connector, D3: cable
- E** Mounting device BT-GS6X
- F** Optical axis
- G** Indicator diodes
- H** Teach button

i Further details can be found in the respective data sheet.





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GS 61 / (I)GS 63

Optical forked sensors	Mouth width / mouth depth	Page
 Optical forked sensors GS 61	3mm / 40mm	436
 Optical forked sensors (I)GS 63	3mm / 60mm	442

Additional products - forked sensors:

 Optical forked sensors	GS 04, GSL 04, GS 21	428
 Capacitive forked sensors	GK 14	446
 Ultrasonic forked sensors	GSU 06, GSU 14C	450
 Measuring CCD forked sensors	GS 754(B)	310

Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 30\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2V) / \leq 2V$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching output
	LED red (optional)	teach / function error
Mechanical data	Housing	GS 61: plastic GS 63: metal/plastic
	Weight	20g ... 100g
Environmental data	Ambient temperature (operation)	-20°C ... +60°C
	VDE safety class	III
	Protection class	IP 65 ¹⁾
	Standards applied	IEC 60947-5-2, UL 508

1) With mounted connector

Mounting systems for this series can be found from page 644 onwards



Features

- Precise detection of labels on base material
- Slim-line design for installation directly on the dispensing edge
- Smallest dimensions with excellent price / performance ratio
- High switching frequency of 10kHz
- Simple adjustment via multiturn potentiometer or teach-in button



Optical Sensor

- Throughbeam sensors Page 689

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OPTICAL FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency	Light source	Output	Switching	Response time
Optical forked sensors with adjustment via multiturn potentiometer						
GS 61 / 6 - S8.3 50110761	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6 - S8 50110110	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6 - S8V 50110112	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6 50110769	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6, 200 - S12 50112423	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6D - S8.3 50110762	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D - S8 50110111	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D - S8V 50110113	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D 50110770	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D, 200 - S12 50112427	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC

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GS 61

Optical forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Repeatability ¹⁾	Connection	Option	Accessories
± 5 ... ± 40µm	M8 connector, 3-pin horizontal outlet	1, 4, 5	a, b
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	1, 4, 5	c, d
± 5 ... ± 40µm	M8 connector, 4-pin vertical outlet	1, 4, 5	c, d
± 5 ... ± 40µm	Cable, 2m	1, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, with M12 connector	1, 4, 5	e, f
± 5 ... ± 40µm	M8 connector, 3-pin horizontal outlet	1, 4, 5	a, b
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	1, 4, 5	c, d
± 5 ... ± 40µm	M8 connector, 4-pin vertical outlet	1, 4, 5	c, d
± 5 ... ± 40µm	Cable, 2m	1, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, with M12 connector	1, 4, 5	e, f

1) Linear, dependent on the conveyor speed, in range 25 ... 200m/min.

Options

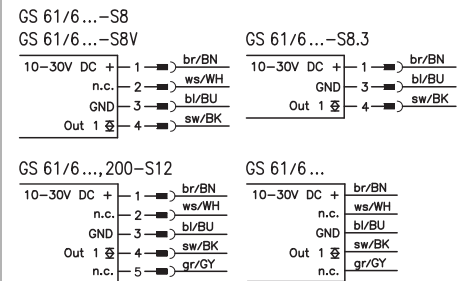
- Sensitivity adjustment via multiturn potentiometer
- Sensitivity adjustment via teach button
- Sensitivity adjustment via teach button and teach input
- Removable operating head for potentiometer adjustment without tool
- UL approval (class 2 acc. to NEC)



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



OPTICAL FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency	Light source	Output	Switching	Response time
Optical forked sensors with adjustment via teach button/teach input						
GS 61 / 6.2 - S8.3 50110765	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6.2 - S8 50110108	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6.2 - S8V 50110763	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6.2 50110767	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6.2, 200 - S12 50112422	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 61 / 6D.2 - S8.3 50110766	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D.2 - S8 50110109	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D.2 - S8V 50110764	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D.2 50110768	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6D.2, 200 - S12 50112426	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC

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GS 61

Optical forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Repeatability ¹⁾	Connection	Option	Accessories
± 5 ... ± 40µm	M8 connector, 3-pin horizontal outlet	2, 4, 5	a, b
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	2, 4, 5	c, d
± 5 ... ± 40µm	M8 connector, 4-pin vertical outlet	2, 4, 5	c, d
± 5 ... ± 40µm	Cable, 2m outlet at 45°	2, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, outlet at 45°, with M12 connector	2, 4, 5	
± 5 ... ± 40µm	M8 connector, 3-pin horizontal outlet	2, 4, 5	a, b
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	2, 4, 5	c, d
± 5 ... ± 40µm	M8 connector, 4-pin vertical outlet	2, 4, 5	c, d
± 5 ... ± 40µm	Cable, 2m outlet at 45°	2, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, outlet at 45°, with M12 connector	2, 4, 5	

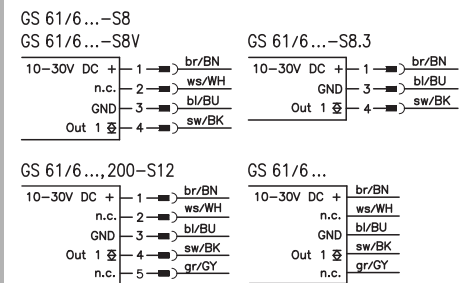
1) Linear, dependent on the conveyor speed, in range 25 ... 200m/min.



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Sensitivity adjustment via teach button
- 3 Sensitivity adjustment via teach button and teach input
- 4 Removable operating head for potentiometer adjustment without tool
- 5 UL approval (class 2 acc. to NEC)

OPTICAL FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency	Light source	Output	Switching	Response time
Optical forked sensors with adjustment via teach button/teach input						
GS 61 / 6.3 50112424	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 61 / 6.3, 200 - S12 50112425	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms

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Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC

			
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GS 61

Optical forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Repeatability ¹⁾	Connection	Option	Accessories
± 5 ... ± 40 μm	Cable, 2m outlet at 45°	3, 5	
± 5 ... ± 40 μm	Cable, 0.2m, outlet at 45°, with M12 connector	3, 5	e, f

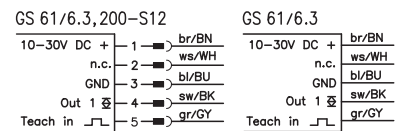
1) Linear, dependent on the conveyor speed, in range 25 ... 200m/min.



Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Sensitivity adjustment via teach button
- 3 Sensitivity adjustment via teach button and teach input
- 4 Removable operating head for potentiometer adjustment without tool
- 5 UL approval (class 2 acc. to NEC)

OPTICAL FORKED SENSORS





Part description Part No.:	Mouth width [mm]	Switching frequency	Light source	Output	Switching	Response time
Optical forked sensors with adjustment via multiturn potentiometer						
GS 63 / 6 - S8 50112617	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 63 / 6 - S8V 50112618	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 63 / 6 50112615	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 63 / 6, 200 - S12 50112616	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 63 / 6D - S8 50112620	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 63 / 6D 50112619	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 63 / 6D, 200 - S8 50118090	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 63 / 6D, 200 - S12 50113790	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC

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GS 63

Optical forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Repeatability ¹⁾	Connection	Option	Accessories
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	1, 4, 5	a, b, c, d
± 5 ... ± 40µm	M8 connector, 4-pin vertical outlet	1, 4, 5	a, b, c, d
± 5 ... ± 40µm	Cable, 2m outlet at 45°	1, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, outlet at 45°, with M12 connector	1, 4, 5	a, b, c, d
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	1, 4, 5	a, b, c, d
± 5 ... ± 40µm	Cable, 2m outlet at 45°	1, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, outlet at 45°, with M8 connector	1, 4, 5	a, b, c, d
± 5 ... ± 40µm	Cable, 0.2m, outlet at 45°, with M12 connector	1, 4, 5	e, f

1) Linear, dependent on the conveyor speed, in range 25 ... 200m/min.

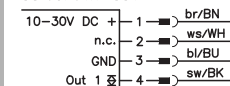


Optical Sensor

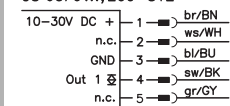
- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection

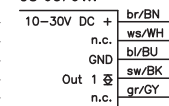
GS 63/6...-S8
GS 63/6...-S8V



GS 63/6...,200-S12



GS 63/6...



Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Sensitivity adjustment via teach button
- 3 Sensitivity adjustment via teach button and teach input
- 4 Removable operating head for potentiometer adjustment without tool
- 5 UL approval (class 2 acc. to NEC)

OPTICAL FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency	Light source	Output	Switching	Response time
Optical forked sensors with adjustment via teach button/teach input						
GS 63 / 6.3 - S8 50110104	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 63 / 6.3 - S8V 50110106	3	10000Hz	Infrared light	1 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
IGS 63 / 6.3 50110759	3	10000Hz	Infrared light	2 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
IGS 63 / 6.3, 200 - S12 50112428	3	10000Hz	Infrared light	2 x push-pull	PNP gap signal NPN label signal	typ. 0.05 ms
GS 63 / 6D.3 - S8 50110105	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
GS 63 / 6D.3 - S8V 50110107	3	10000Hz	Infrared light	1 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
IGS 63 / 6D.3 50110760	3	10000Hz	Infrared light	2 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms
IGS 63 / 6D.3, 200 - S12 50112429	3	10000Hz	Infrared light	2 x push-pull	PNP label signal NPN gap signal	typ. 0.05 ms

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC

We reserve the right to make changes • GS_63_2_EN.fm



(I)GS 63

Optical forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Repeatability ¹⁾	Connection	Option	Accessories
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	3, 5	a, b, c, d
± 5 ... ± 40µm	M8 connector, 4-pin vertical outlet	3, 5	a, b, c, d
± 5 ... ± 40µm	Cable, 2m outlet at 45°	3, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, outlet at 45°, with M12 connector	3, 4, 5	e, f
± 5 ... ± 40µm	M8 connector, 4-pin horizontal outlet	3, 5	a, b, c, d
± 5 ... ± 40µm	M8 connector, 4-pin vertical outlet	3, 5	a, b, c, d
± 5 ... ± 40µm	Cable, 2m outlet at 45°	3, 4, 5	
± 5 ... ± 40µm	Cable, 0.2m, outlet at 45°, with M12 connector	3, 4, 5	e, f

1) Linear, dependent on the conveyor speed, in range 25 ... 200m/min.

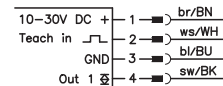


Optical Sensor

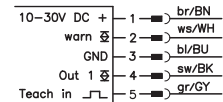
- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection

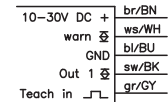
GS 63/6...-S8
GS 63/6...-S8V



IGS 63/6...,200-S12



IGS 63/6...



Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Sensitivity adjustment via teach button
- 3 Sensitivity adjustment via teach button and teach input
- 4 Warning output
- 5 UL approval (class 2 acc. to NEC)

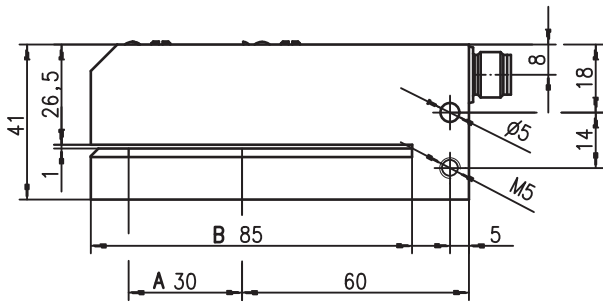
OVERVIEW OF CAPACITIVE FORKED SENSORS



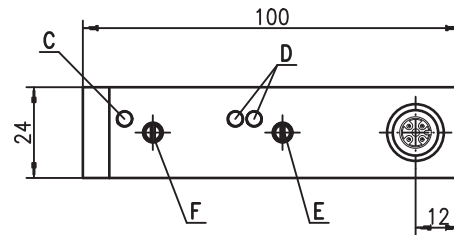
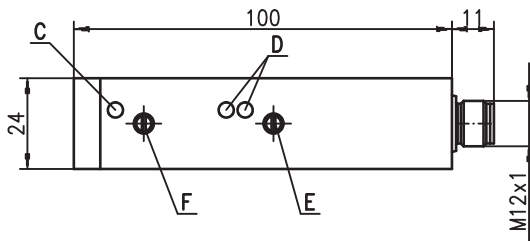
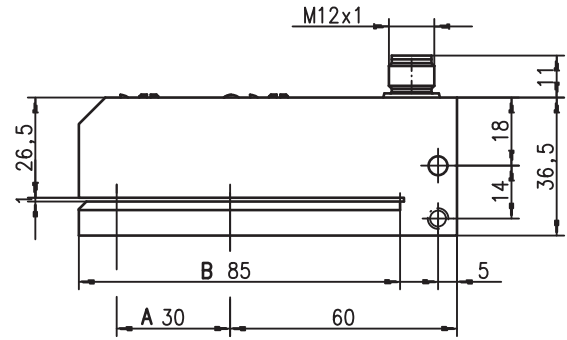
Detection of transparent labels

Dimensioned drawing


GK 14 / 24 L



GK 14 / 24 L.2



- A** Sensor
- B** Mouth depth
- C** Switching output indicator diode
- D** Base adjustment indicator diode
- E** Base adjustment
- F** Sensitivity adjustment (clockwise rotation = increase in sensitivity)

 Further details can be found in the respective data sheet.





We reserve the right to make changes • GK_14_Overview_EN.fm

 <p>GS 04/21 Page 428</p>	 <p>GS 61/63 Page 434</p>	 <p>GK 14 Page 446</p>	 <p>GSU 06/14C Page 450</p>
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GK 14

Capacitive forked sensors	Mouth widths	Page
 Capacitive forked sensors GK 14	0.9 ± 0.1 mm	448

Additional products - forked sensors:

 Optical forked sensors	GS 04, GSL 04, GS 21	428
 Optical forked sensors	GS 61, (I)GS 63	434
 Ultrasonic forked sensors	GSU 06, GSU 14C	450
 Measuring CCD forked sensors	GS 754(B)	310



Common technical data

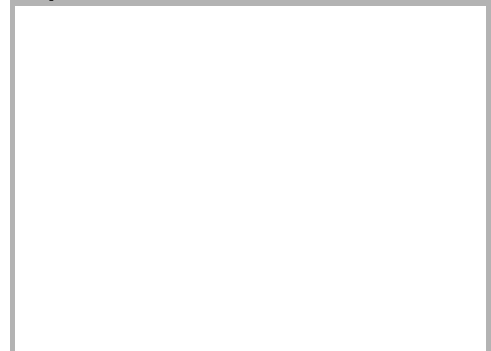
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	≤ 15% of U_B
	Open-circuit current	≤ 35mA
	Signal voltage high/low	≥ ($U_B - 2V$) / ≤ 2V
Indicators	Yellow LED 1	Switching output
	Yellow LED 2	Base adjustment
Mechanical data	Housing	Aluminum, anodized
	Weight	175g
Environmental data	Ambient temperature (operation)	0°C ... +60°C
	VDE safety class	III
	Protection class	IP 65
	Standards applied	IEC 60947-5-2

Features

- Detection of paper and transparent labels
- Conveyor speeds up to 10m/s
- Attractive cost/performance ratio



Optical Sensor



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

CAPACITIVE FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency	Sensor principle	Output	Switching	Response time
Capacitive forked sensors						
GK 14 / 24 L 50026371	0.9 ± 0.1	5000Hz	Capacitive	1 x NPN 1 x PNP	Light	0.1 ms
GK 14 / 24 L.2 50031714	0.9 ± 0.1	5000Hz	Capacitive	1 x NPN 1 x PNP	Light	0.1 ms

We reserve the right to make changes • GK_14_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC	
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC	
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC	
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC	
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC	
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC	

			
GS 04/21 Page 428	GS 61/63 Page 434	GK 14 Page 446	GSU 06/14C Page 450

GK 14

Capacitive forked sensors



Repeatability	Connection	Option	Accessories
± 0.20mm	M12 connector	1, 2, 3	a, b, c, d, e, f
± 0.20mm	M12 connector ¹⁾	1, 2, 3	a, b, c, d, e, f

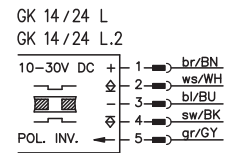
1) Plug outlet points upward



Optical Sensor

- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Base adjustment via potentiometer
- 3 Inverting input for switching output signal

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

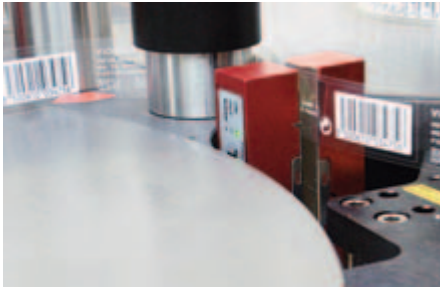
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW OF ULTRASONIC FORKED SENSORS



Detection of transparent labels



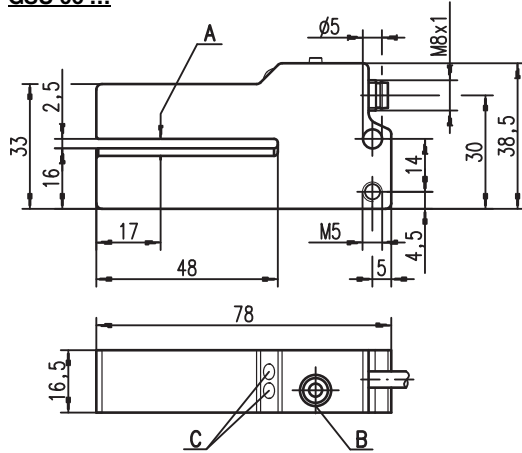
Detection of paper labels



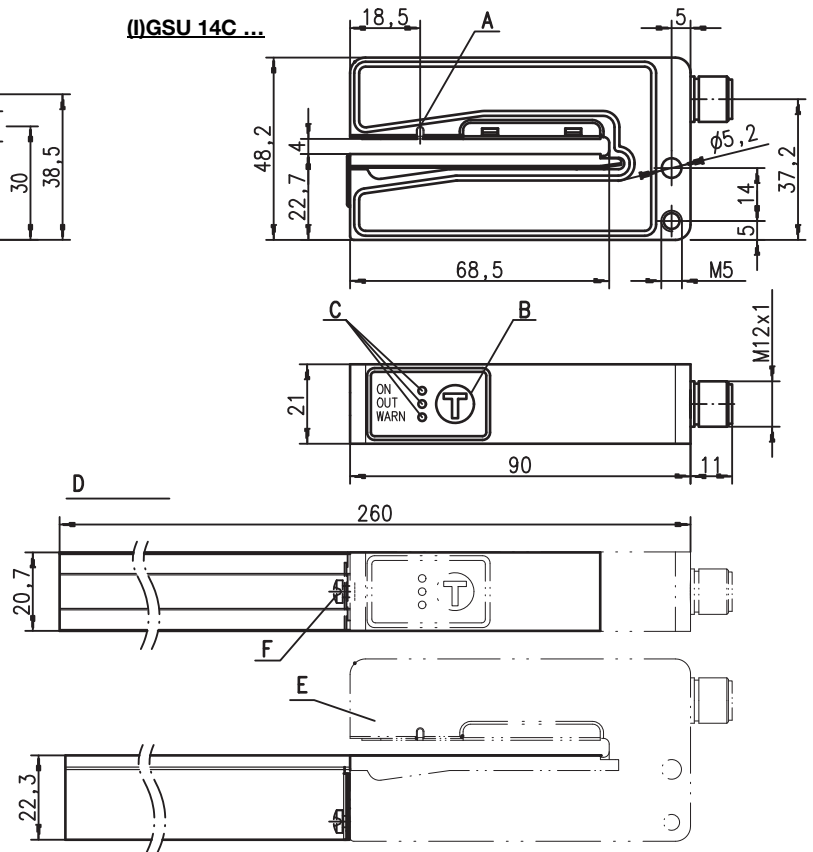
Detection of metalized labels

Dimensioned drawing

GSU 06 ...



(I)GSU 14C ...





- A** Sensor marker (center of label tape)
- B** Teach-in button
- C** Indicator diodes
- D** View with extended carriage mounted
- E** Sensor
- F** Fastening screw for carriage

i Further details can be found in the respective data sheet.

We reserve the right to make changes • GSU_06_14_Overview_EN.fim

			
GS 04/21 Page 428	GS 61/63 Page 434	GK 14 Page 446	GSU 06/14C Page 450

GSU 06 / (I)GSU 14C

Ultrasonic forked sensors	Mouth widths	Page
 Ultrasonic forked sensors GSU 06	2.5mm	452
 Ultrasonic forked sensors (I)GSU 14C	4mm	454

Additional products - forked sensors:

 Optical forked sensors	GS 04, GSL 04, GS 21	428
 Optical forked sensors	GS 61, (I)GS 63	434
 Capacitive forked sensors	GK 14	446
 Measuring CCD forked sensors	GS 754(B)	310

Common technical data

Electrical data	Operating voltage U_B	10 ... 30/12 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 40\text{mA}/\leq 70\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V})/\leq 2\text{V}$
Indicators	Green LED	Ready/Teach-in
	Yellow LED	Switching point in the label gap
	Red LED	Teach/function error
Mechanical data	Housing	Aluminum, anodized
	Weight	60g / 160g
Environmental data	Ambient temperature (operation)	GSU 06: $+5^\circ\text{C} \dots +50^\circ\text{C}$ GSU 14C: $0^\circ\text{C} \dots +60^\circ\text{C}$
	VDE safety class	III
	Protection class	GSU 06: IP 62 GSU 14C: IP 65
	Standards applied	IEC 60947-5-2, UL 508
	Accessories for this series can be found from page 644 onwards	

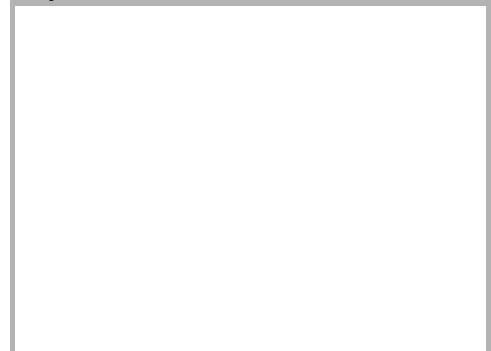


Features

- Detection of paper, transparent and metalized labels
- Conveyor speeds up to 4m/s
- Simple adjustment via teach-in button or remote calibration



Optical Sensor



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

ULTRASONIC FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Switching frequency ¹⁾	Sensor principle	Output	Switching	Response time
Ultrasonic forked sensors						
GSU 06 / 24 - 2 - S8 50039638	2.5	2000 labels/min.	Ultrasonics	1 x NPN 1 x PNP	Light	0.15 ms
GSU 06 / 24 - 2 50040191	2.5	2000 labels/min.	Ultrasonics	1 x NPN 1 x PNP	Light	0.15 ms
GSU 06 / 24D - 2 - S8 50040190	2.5	2000 labels/min.	Ultrasonics	1 x NPN 1 x PNP	Dark	0.15 ms
GSU 06 / 24D - 2 50040192	2.5	2000 labels/min.	Ultrasonics	1 x NPN 1 x PNP	Dark	0.15 ms
GSU 06 / 24D - 2, 200 - S12 50108819	2.5	2000 labels/min.	Ultrasonics	1 x NPN 1 x PNP	Dark	0.15 ms

1) Depending on conveyor speed, label length and label gap
2) Material dependent

We reserve the right to make changes • GSU_06_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC	
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC	
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC	
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC	

			
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GSU 06

Ultrasonic forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

	Repeatability ²⁾	Connection	Option	Accessories
	±0.3mm	M8 connector	1, 4	a, b, c, d
	±0.3mm	Cable, 2m	1, 2, 4	
	±0.3mm	M8 connector	1, 4	a, b, c, d
	±0.3mm	Cable, 2m	1, 2, 4	
	±0.3mm	Cable, 0.2m, with M12 connector	1, 2, 4	e, f

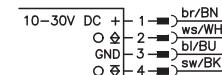


Optical Sensor

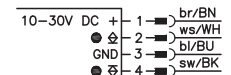
- Connection types Page 694
- Outputs Page 694

Electrical connection

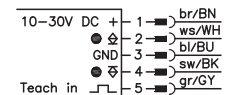
GSU 06/24-2-S8



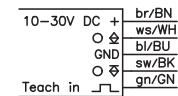
GSU 06/24 D-2-S8



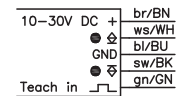
GSU 06/24 D-2, 200-S12



GSU 06/24-2



GSU 06/24 D-2



Options

- 1 Teach-in via teach button
- 2 Teach-in via teach input
- 3 Forked sensor for tape-tear monitoring
- 4 UL approval

ULTRASONIC FORKED SENSORS

Part description Part No.:	Mouth width [mm]	Conveyor speed [m/min.]	Sensor principle	Output	Switching	Response time
Ultrasonic forked sensors						
IGSU 14C / 6.3 - S12 50116936	4	≤ 240 ¹⁾	Ultrasonics	1 x Push-pull/DC	Light/dark antivalent	≤ 200 μs
IGSU 14C / 6.3 SD - S12 50115736	4	≤ 2400 ²⁾	Ultrasonics	1 x Push-pull/DC	Light/dark antivalent	≤ 250 μs
IGSU 14C / 6.31 - S12 50116937	4	≤ 240 ¹⁾	Ultrasonics	1 x Push-pull/DC	Light/dark antivalent	≤ 200 μs
IGSU 14C / 6D.3 - S12 50116938	4	≤ 240 ¹⁾	Ultrasonics	1 x Push-pull/DC	Dark/light antivalent	≤ 200 μs
GSU 14C / 66.3 - S12 50116933	4	≤ 240 ¹⁾	Ultrasonics	2 x Push-pull/DC	Light/dark antivalent	≤ 200 μs
GSU 14C / 66D.3 - S12 50116934	4	≤ 240 ¹⁾	Ultrasonics	2 x Push-pull/DC	Dark/light antivalent	≤ 200 μs
GSU 14C / 66D.31 - S12 50116935	4	≤ 240 ¹⁾	Ultrasonics	2 x Push-pull/DC	Dark/light antivalent	≤ 200 μs

1) Label length ≥ 5mm, label gap ≥ 2mm
2) At splice width ≥ 10mm

We reserve the right to make changes • GSU_14C_EN.fm

Accessories / connection cables More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC
f 50114056	FS 14BML.5	Extended guide rail for GSU 14C, 260mm long

			
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(I)GSU 14C
Ultrasonic forked sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Repeatability ¹⁾	Connection	Option	Accessories
±0.2mm	M12 connector	1, 2, 3, 4, 5, 8	a, b, c, d, e, f
	M12 connector	1, 2, 3, 5, 7, 8	a, b, c, d, e, f
±0.2mm	M12 connector	1, 2, 3, 4, 5, 6, 8	a, b, c, d, e
±0.2mm	M12 connector	1, 2, 3, 4, 5, 8	a, b, c, d, e, f
±0.2mm	M12 connector	1, 2, 8	a, b, c, d, e, f
±0.2mm	M12 connector	1, 2, 8	a, b, c, d, e, f
±0.2mm	M12 connector	1, 2, 6, 8	a, b, c, d, e

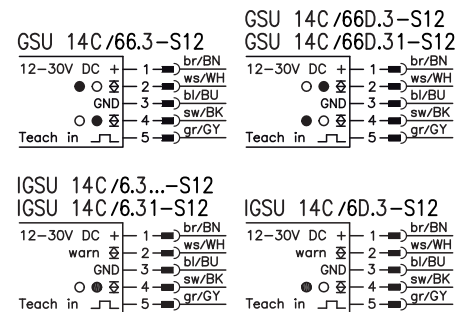
1) Depending on material, conveyor speed, label length and spacing between labels



Optical Sensor

- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach-in via teach button
- 2 Teach-in via teach input
- 3 *easyTeach* function
- 4 ALC (auto level control) - online optimization of the switching threshold
- 5 Warning output
- 6 With extended carriage
- 7 20ms pulse stretching
- 8 UL approval (class 2 acc. to NEC)

SELECTION GUIDE

Contrast scanners

Operating principle



Contrast scanners detect markings, even those with only slight contrast with respect to the background, at very high processing speeds. Automatic adaptation of the wavelength allows the slightest changes in gray value to be detected, independent of the color combination of the marking and background.

Products and typ. scanning ranges [mm]



KRT... 3B
Scanning ranges: **14.5 / 60**

from **page 458** onwards



KRT... 55
Scanning ranges: **13**

from **page 458** onwards



KRT... 20B
Scanning ranges: **13.5**

from **page 458** onwards



KRTM 20
Scanning ranges: **12 / 20 / 50**

from **page 458** onwards

Features

- Multicolor-, white-light- and laser contrast scanners available
- Detection of the slightest differences in contrast by means of highly dynamic transmitter regulation
- Various teach-in variants for optimum process integration
- Special functions can be enabled via a keyboard
- Temperature compensation ensures stable scanning over a long operating period

Color sensors

Operating principle



Color sensors detect the color of an object by comparing with a taught-in reference color. They generate a switching signal when both colors match within a specified tolerance range.

Products and typ. scanning ranges [mm]



CRT 20B
Scanning ranges: **12.5 / 60**

from **page 486** onwards



CRT 442
Scanning ranges: **12.5**

from **page 486** onwards



CRT 448
Scanning ranges: **18 ... 22 / 12 ... 32**

from **page 486** onwards

Features

- Multicolor LED transmitter
- Color detection with incident light and transmitted light
- Detection of different colors via up to 4 digital outputs
- Up to four reference colors can be stored
- Programming via teach-in
- Analogue evaluation with transmitter switchover

Luminescence scanners

Operating principle



A luminescent material which is illuminated with blue light reflects light with a longer wavelength. This effect, combined with appropriate filtering, makes it possible to detect luminescent markings or materials, even on optically critical surfaces.

Products and typ. scanning ranges [mm]



LRT 8

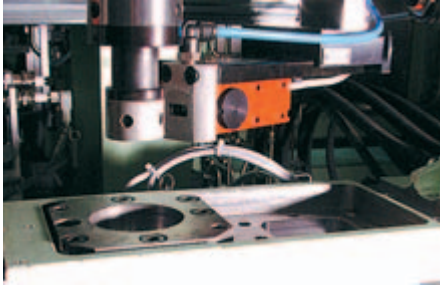
Typical scanning ranges: **0 ... 500**

from **page 494** onwards

Features

- UV LED transmitter or blue light LED transmitter
- Detection of visible and invisible luminescent materials
- Filtering options
- Different light-spot profiles
- PNP and NPN outputs

OVERVIEW OF CONTRAST SCANNERS



Slit and hole recognition



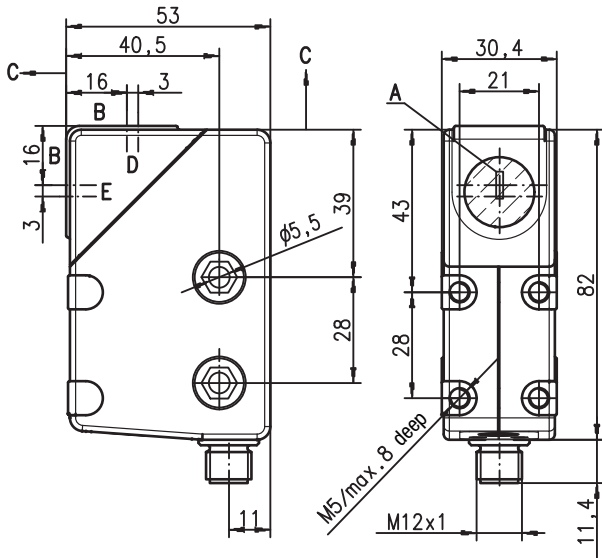
Mark detection



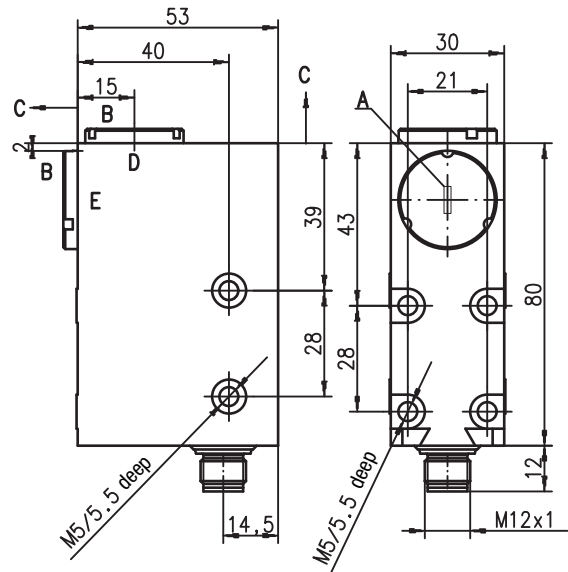
Dimensioned drawing KRT... 3B... see 3B Series standard sensors on page 32.
Dimensioned drawing KRT... 55... see 55 Series standard sensors on page 152.

Dimensioned drawing

KRT... 20B



KRT... 20



- A Vertical light spot orientation
- B Optical axis
- C Scanning range
- D Head
- E Front



Further details can be found in the respective data sheet.

We reserve the right to make changes • KRT_Overview_EN.fm



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KRT 3B / 55 / 20(B)

Contrast scanners	Scanning ranges	Page
 Contrast scanner KRT... 3B	14.5 / 60mm	460
 Contrast scanner KRT... 55	13mm	470
 Contrast scanner KRT... 20(B)	12 ... 50mm	476

Additional products - special sensors:

 Color sensors	CRT 20B, CRT 442, CRT 448	486
 Luminescence scanners	LRT 8	494



Common technical data

Electrical data	Operating voltage U_B	10 ... 30/18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}/\leq 60\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V})/\leq 2\text{V}$
Indicators	Green LED	Ready, teach-in
	Yellow LED	Obj. detected, teach-in
Mechanical data	Housing	Metal
	Optics cover	Glass
	Weight (...3B/...55/...20)	10g/50g/300g
Environmental data	Ambient temperature (operation)	..3B: -30°C ... +55°C
		Laser 3B: -10°C ... +55°C
		..55/20B: -30°C ... +55°C
		..20: -25°C ... +60°C
	VDE safety class	II
	Protection class	IP 67, IP 69K
LED class	1 acc. to EN 60825-1	
Standards applied	IEC 60947-5-2, UL 508	

Mounting systems for this series can be found from page 629 onwards

Features

- Multicolor, white light or laser light
- Variants with interchangeable lenses for scanning ranges of 12mm, 20mm and 50mm
- Models with memory for up to 128 different labels
- Analog and digital 10 μ s high-speed interface
- Automatic amplifier adaptation for shiny cut marks
- IO-Link



Optical Sensor

- Contrast scanners Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 3B / 4.1121 - S8 50110584	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.1121, 200 - S12 50110586	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.1221 - S8 50110588	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.1221, 200 - S12 50110590	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.2121 - S8 50111768	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 3B

Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

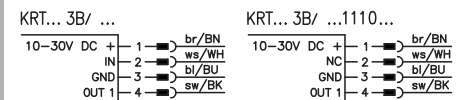
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 5, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 5, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d



Optical Sensor

- Contrast scanners Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 Light spot orientation horizontal
- 10 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 3B / 2.1121 - S8 50110585	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 3B / 2.1121, 200 - S12 50110587	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 3B / 2.1221 - S8 50110589	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 3B / 2.1221, 200 - S12 50110591	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 3B / 6.1121 - S8 50111312	14.5 ± 2mm	10(18) ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xPush-pull/DC
KRTM 3B / 6.1221 - S8 50111313	14.5 ± 2mm	10(18) ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xPush-pull/DC
KRTM 3B / 6.2121 - S8 50118393	14.5 ± 2mm	10(18) ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xPush-pull/DC

We reserve the right to make changes • KRTM_3B_2_EN.fm

Accessories / connection cables

 More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC


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KRT 3B

Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

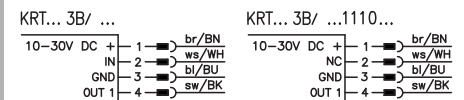
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 11	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 11	e, f
M8 connector	1, 5, 6, 7, 8, 11	a, b, c, d
Cable, 0.2m, with M12 connector	1, 5, 6, 7, 8, 11	e, f
M8 connector	1, 4, 6, 7, 8, 9, 11	a, b, c, d
M8 connector	1, 5, 6, 7, 8, 9, 11	a, b, c, d
M8 connector	1, 5, 6, 7, 8, 9, 10, 11	a, b, c, d



Optical Sensor

- Contrast scanners Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 IO-Link COM2
- 10 Light spot orientation horizontal
- 11 UL approval (class 2 acc. to NEC)

www.leuze.com/en/special-sensors/

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner					
KRTW 3B / 4.1110 - S8 50110572	14.5 ± 2mm	10 ... 30VDC	6kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.1121 - S8 50110576	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.1121, 200 - S12 50110578	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.2121 - S8 50111769	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 4.0 x 1.5mm ²	1 x PNP
KRTW 3B / 4.1321 - S8 50110580	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.1321, 200 - S12 50110582	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP

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Accessories / connection cables

 More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC


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KRT 3B

Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

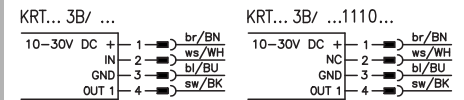
Connection	Option	Accessories
M8 connector	2, 4, 5, 10	a, b, c, d
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d
M8 connector	1, 3, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 3, 6, 7, 8, 10	e, f



Optical Sensor

- Contrast scanners Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Economy housing
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 Light spot orientation horizontal
- 10 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner					
KRTW 3B / 2.1110 - S8 50110573	14.5 ± 2mm	10 ... 30VDC	6kHz	White light 1.5 x 4.0mm ²	1xNPN
KRTW 3B / 2.1121 - S8 50110577	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xNPN
KRTW 3B / 2.1121, 200 - S12 50110579	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xNPN
KRTW 3B / 2.1321 - S8 50110581	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xNPN
KRTW 3B / 2.1321, 200 - S12 50110583	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xNPN
KRTW 3B / 6.1121 - S8 50111319	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xPush-pull/DC
KRTW 3B / 6.1321 - S8 50111320	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xPush-pull/DC

We reserve the right to make changes • KRTW_3B_2_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 3B

Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

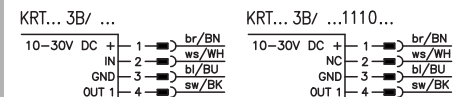
Connection	Option	Accessories
M8 connector	2, 4, 5, 10	a, b, c, d
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 3, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 3, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d
M8 connector	1, 3, 6, 7, 8, 9, 10	a, b, c, d



Optical Sensor

- Contrast scanners Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 IO-Link COM2
- 10 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Laser contrast scanner					
KRTL 3B / 4.3111 - S8 50110592	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1 x PNP
KRTL 3B / 4.3111, 200 - S12 50110594	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1 x PNP
KRTL 3B / 2.3111 - S8 50110593	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1xNPN
KRTL 3B / 2.3111, 200 - S12 50110595	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1xNPN
KRTL 3B / 6.3111 - S8 50111321	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1xPush-pull/DC

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 3B

Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

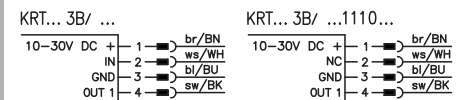
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d



Optical Sensor

- Contrast scanners Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 IO-Link COM2
- 10 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 55 / 4.1121 - S8 50111644	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1121, 5000 50114074	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1121, 200 - S12 50110611	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1221 - S8 50110613	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1221, 200 - S12 50110615	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 55

Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

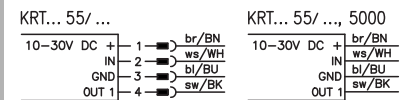
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 9	a, b, c, d
Cable, 5 m	1, 4, 6, 7, 8, 9	
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 9	e, f
M8 connector	1, 5, 6, 7, 8, 9	a, b, c, d
Cable, 0.2m, with M12 connector	1, 5, 6, 7, 8, 9	e, f



Optical Sensor

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- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 IO-Link COM2
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 55 / 2.1121 - S8 50110610	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 55 / 2.1121, 200 - S12 50110612	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 55 / 2.1221 - S8 50110614	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 55 / 2.1221, 200 - S12 50110616	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xNPN
KRTM 55 / 6.1121 - S8 50111643	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1xPush-pull/DC

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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KRT 55
Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

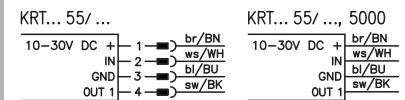
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 9	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 9	e, f
M8 connector	1, 5, 6, 7, 8, 9	a, b, c, d
Cable, 0.2m, with M12 connector	1, 5, 6, 7, 8, 9	e, f
M8 connector	1, 2, 4, 6, 7, 8, 9	a, b, c, d



Optical Sensor

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- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 IO-Link COM2
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 UL approval (class 2 acc. to NEC)

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CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner					
KRTW 55 / 4.1121 - S8 50111642	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 55 / 4.1121, 5000 50114075	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 55 / 4.1121, 200 - S12 50110602	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 55 / 2.1121 - S8 50110601	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xNPN
KRTW 55 / 2.1121, 200 - S12 50110603	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xNPN
KRTW 55 / 6.1121 - S8 50111641	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1xPush-pull/DC

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 55
Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

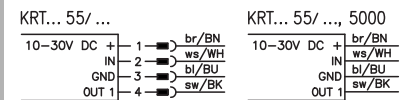
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 5 m	1, 4, 6, 7, 8, 10	
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 2, 4, 6, 7, 8, 10	a, b, c, d



Optical Sensor

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- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach input
- 2 IO-Link COM2
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 Light spot orientation horizontal
- 10 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
RGB multicolor contrast scanners					
KRTM 20B/4.4110 - S12 50112446	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.5110 - S12 50112447	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.4121 - S12 50111627	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.4221 - S12 50111633	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.5121 - S12 50111628	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.5221 - S12 50111634	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.6121 - S12 50111771	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 1.5 x 4mm ²	PNP

We reserve the right to make changes • KRTM_20B_1_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



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KRT 20B
Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

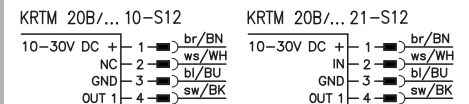
Connection	Option	Accessories
M12 connector	1, 4, 7	a, b, c, d, e, f
M12 connector	1, 5, 7	a, b, c, d, e, f
M12 connector	2, 4, 7	a, b, c, d, e, f
M12 connector	3, 4, 7	a, b, c, d, e, f
M12 connector	2, 5, 7	a, b, c, d, e, f
M12 connector	3, 5, 7	a, b, c, d, e, f
M12 connector	2, 4, 6, 7	a, b, c, d, e, f



Optical Sensor

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- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Static 2-point teach-in via teach button
- 2 Static 2-point teach-in via teach button/input
- 3 Dynamic 2-point teach-in via teach button/input
- 4 Light beam gate on face
- 5 Light beam gate on front
- 6 Light spot orientation horizontal
- 7 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
RGB multicolor contrast scanners					
KRTM 20B/2.4110 - S12 50110600	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.5110 - S12 50112445	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.4121 - S12 50111629	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.4221 - S12 50111635	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.5121 - S12 50111630	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.5221 - S12 50111636	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/6.4121 - S12 50111625	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 1.5 x 4 mm ²	Push-pull/DC
KRTM 20B/6.5121 - S12 50111626	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 1.5 x 4 mm ²	Push-pull/DC

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



KRT 20B
Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

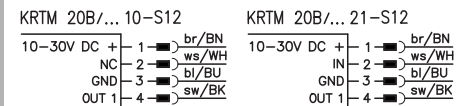
Connection	Option	Accessories
M12 connector	1, 4, 7	a, b, c, d, e, f
M12 connector	1, 5, 7	a, b, c, d, e, f
M12 connector	2, 4, 7	a, b, c, d, e, f
M12 connector	3, 4, 7	a, b, c, d, e, f
M12 connector	2, 5, 7	a, b, c, d, e, f
M12 connector	3, 5, 7	a, b, c, d, e, f
M12 connector	2, 4, 6, 7	a, b, c, d, e, f
M12 connector	2, 5, 6, 7	a, b, c, d, e, f



Optical Sensor

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- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Static 2-point teach-in via teach button
- 2 Static 2-point teach-in via teach button/input
- 3 Dynamic 2-point teach-in via teach button/input
- 4 Light beam gate on face
- 5 Light beam gate on front
- 6 IO-Link COM2
- 7 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner					
KRTW 20B/4.4121 - S12 50111621	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	PNP
KRTW 20B/4.5121 - S12 50111622	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	PNP
KRTW 20B/4.6121 - S12 50111770	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 1.5 x 4 mm ²	PNP
KRTW 20B/2.4121 - S12 50111623	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	NPN
KRTW 20B/2.5121 - S12 50111624	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	NPN

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



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KRT 20B
Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Connection	Option	Accessories
M12 connector	1, 2, 6	a, b, c, d, e, f
M12 connector	1, 3, 6	a, b, c, d, e, f
M12 connector	1, 2, 4, 6	a, b, c, d, e, f
M12 connector	1, 2, 6	a, b, c, d, e, f
M12 connector	1, 3, 6	a, b, c, d, e, f



Optical Sensor

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- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Static 2-point teach-in via teach button/input
- 2 Light beam gate on face
- 3 Light beam gate on front
- 4 Light spot orientation horizontal
- 5 IO-Link COM2
- 6 UL approval (class 2 acc. to NEC)

CONTRAST SCANNERS

Part description Part No.:	Scanning range ¹⁾	Operating voltage	Switching frequency	Light source Light spot	Output
RGB multicolor contrast scanners					
KRTM 20 M/P - 12 - 6420 - S12 50116474	12 ± 1 mm	12 ... 30VDC	25/50kHz (digital)	RGB light 3.0 x 1.0mm ²	PNP
KRTM 20 M/P - 20 - 6320 - S12 50113435	20 ± 2 mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	PNP
KRTM 20 M/P - 20 - 3320 - S12 50114202	20 ± 2 mm	12 ... 30VDC	25/50kHz (digital)	RGB light Ø 0.6mm	PNP
KRTM 20 M/N - 20 - 6320 - S12 50113436	20 ± 2 mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	NPN
KRTM 20 M/N - 20 - 3320 - S12 50114201	20 ± 2 mm	12 ... 30VDC	25/50kHz (digital)	RGB light Ø 0.6mm	NPN

1) Other scanning ranges of 12 ± 1 mm, 20 ± 2 mm or 50 ± 5 mm are possible by changing the lens.

We reserve the right to make changes • KRTM_20_1_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
b 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
c 50034051	OB 12 - KRT 20	Lens for 12mm scanning range
d 50034050	OB 20 - KRT 20	Lens for 20mm scanning range
e 50034049	OB 50 - KRT 20	Lens for 50mm scanning range
f 50034118	WZ - OB - KRT 20	Tool for changing lenses



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KRTM 20
Contrast scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

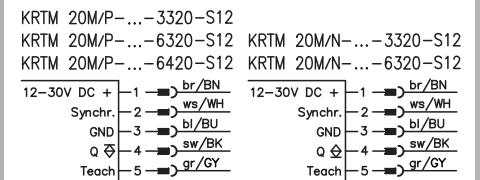
Connection	Option	Accessories
M12 connector	2, 3, 4, 7, 8, 9	a, b, c, d, e, f
M12 connector	1, 3, 4, 7, 8, 9	a, b, c, d, e, f
M12 connector	1, 3, 4, 7, 8, 9	a, b, c, d, e, f
M12 connector	1, 3, 4, 7, 8, 9	a, b, c, d, e, f
M12 connector	1, 3, 4, 7, 8, 9	a, b, c, d, e, f



Optical Sensor

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- Connection types Page 694
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Electrical connection



Options

- 1 Static teach-in via teach button/line
- 2 Dynamic teach-in via teach button/line
- 3 Synchronous input
- 4 High resolution design: 70 gray levels for digital/ 400 gray levels for analog
- 5 Cut-marking system with memory for 128 data sets
- 6 Freely programmable via protocol interface (buttons disabled)
- 7 Switchable pulse stretching
- 8 Light/dark switching
- 9 UL approval

CONTRAST SCANNERS

Part description Part No.:	Scanning range ¹⁾	Operating voltage	Switching frequency	Light source Light spot	Output
RGB multicolor contrast scanners					
KRTM 20 M/V - 20 - 0004 - S12 50041007	20 ± 2mm	12 ... 30VDC	16kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA PNP
KRTM 20 M/V - 20 - 0001 - S12 50035674	20 ± 2mm	12 ... 30VDC	16kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA PNP
KRTM 20 M/C - 20 - 6526 - S12 50113438	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA PNP
KRTM 20 M/C - 20 - 6626 - S12 50113437	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA NPN
KRTM 20 M/P - 50 - 6320 - S12 50116177	50 ± 5mm	12 ... 30VDC	25/50kHz (digital)	RGB light 10.0 x 2.0mm ²	PNP

1) Other scanning ranges of 12 ± 1 mm, 20 ± 2mm or 50 ± 5mm are possible by changing the lens.

We reserve the right to make changes • KRTM_20_2_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
b 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
c 50034051	OB 12 - KRT 20	Lens for 12mm scanning range
d 50034050	OB 20 - KRT 20	Lens for 20mm scanning range
e 50034049	OB 50 - KRT 20	Lens for 50mm scanning range
f 50034118	WZ - OB - KRT 20	Tool for changing lenses



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KRTM 20
Contrast scanners



Connection	Option	Accessories
M12 connector	1, 5, 7, 8, 9	a, b, c, d, e, f
M12 connector	6, 9	a, b, c, d, e, f
M12 connector	1, 4, 7, 8, 9	a, b, c, d, e, f
M12 connector	1, 4, 7, 8, 9	a, b, c, d, e, f
M12 connector	1, 3, 4, 7, 8, 9	a, b, c, d, e, f

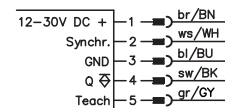


Optical Sensor

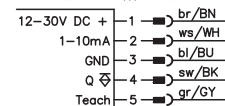
- Contrast scanners Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

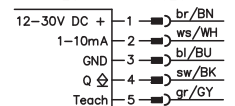
KRTM 20M/P-...-6320-S12



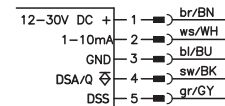
KRTM 20M/C-...-6526-S12



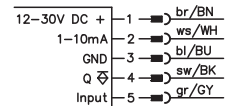
KRTM 20M/C-...-6626-S12



KRTM 20M/V-20-0004-S12



KRTM 20M/V-20-0001-S12



Options

- 1 Static teach-in via teach button/line
- 2 Dynamic teach-in via teach button/line
- 3 Synchronous input
- 4 High resolution design: 70 gray levels for digital/ 400 gray levels for analog
- 5 Cut-marking system with memory for 128 data sets
- 6 Freely programmable via protocol interface (buttons disabled)
- 7 Switchable pulse stretching
- 8 Light/dark switching
- 9 UL approval

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

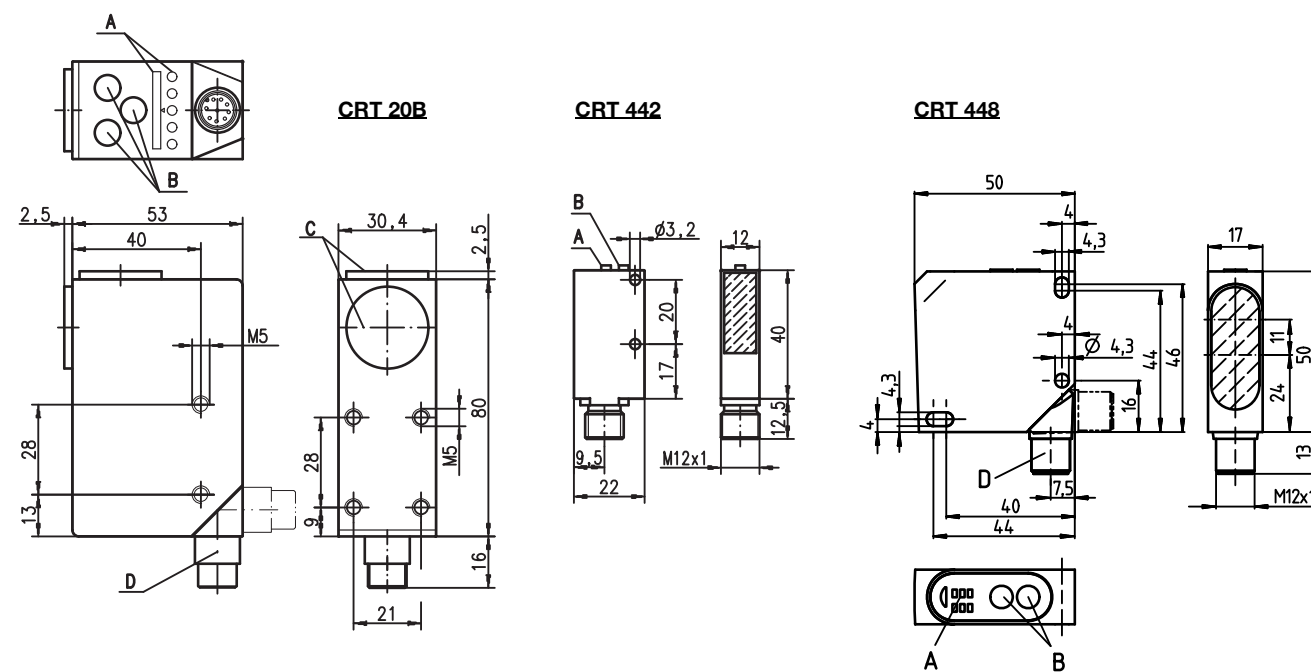
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW OF COLOR SENSORS

Dimensioned drawing






- A** Display elements
- B** Control buttons
- C** Lens
- D** 90° turning connector

i Further details can be found in the respective data sheet.

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<p>KRT Page 458</p>	<p>CRT Page 486</p>	<p>LRT Page 494</p>

CRT 20B / 442 / 448

Color sensors	Scanning ranges	Page
 Color sensors - digital output CRT 20B	12.5 / 60mm	488
 Color sensors - digital output CRT 442	12.5mm	490
 Color sensors - digital output CRT 448	12 ... 32mm (S) 18 ... 22mm (L)	492

Additional products - special sensors:

 Contrast scanners	KRT... 3B, KRT... 55, KRT... 20(B)	458
 Luminescence scanners	LRT 8	494



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC / 24VDC 12 ... 28VDC
	Residual ripple	$\leq 10(15)\%$ of U_B
	Open-circuit current	$\leq 80\text{mA} / \leq 60\text{mA} / \leq 40\text{mA}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching state/error
	Red LED (CRT 448...)	Tolerance level
Mechanical data	Housing	ABS / metal
	Optics cover	PMMA / glass
	Weight (...448/...20)	40g/125g/300g
Environmental data	Ambient temperature (operation)	-10°C ... +55°C ...20: -25°C ... +55°C
	Protection class	IP 67
	Eye safety	Exempt group (EN 62471)
	Standards applied	IEC 60947-5-2, UL 508

Mounting systems for this series can be found from page 629 onwards

Features

- Scanning ranges of 12.5mm to 60mm
- Simple assignment of colors with teach function
- High switching frequencies
- Up to 4 digital switching outputs



Optical Sensor

- Color sensors Page 691

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
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Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

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Sensors

Light
Curtains

Protective
Sensors

COLOR SENSORS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Color sensors with digital output					
CRT 20B M/P - 60 - 001 - S12 50109597	60mm	10 ... 30VDC	6kHz	RGB light 13.0 x 13.0mm ²	1 x PNP
CRT 20B M/P - 60 - 004 - S12 50109601	60mm	10 ... 30VDC	3.5kHz	RGB light 13.0 x 13.0mm ²	4 x PNP
CRT 20B M/N - 60 - 001 - S12 50109595	60mm	10 ... 30VDC	6kHz	RGB light 13.0 x 13.0mm ²	1xNPN
CRT 20B M/N - 60 - 004 - S12 50109599	60mm	10 ... 30VDC	3.5kHz	RGB light 13.0 x 13.0mm ²	4xNPN
CRT 20B M/P - 12 - 001 - S12 50109596	12.5mm	10 ... 30VDC	6kHz	RGB light 4.0 x 2.0mm ²	1 x PNP
CRT 20B M/P - 12 - 004 - S12 50109600	12.5mm	10 ... 30VDC	3.5kHz	RGB light 4.0 x 2.0mm ²	4 x PNP
CRT 20B M/N - 12 - 001 - S12 50109594	12.5mm	10 ... 30VDC	6kHz	RGB light 4.0 x 2.0mm ²	1xNPN
CRT 20B M/N - 12 - 004 - S12 50109598	12.5mm	10 ... 30VDC	3.5kHz	RGB light 4.0 x 2.0mm ²	4xNPN

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Accessories / connection cables

 More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
b 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
c 50104591	K - D M12A - 8P - 2m - PUR	Connection cable 2000mm, M12 axial, 8-pin, PUR
d 50104590	K - D M12A - 8P - 5m - PUR	Connection cable 5000mm, M12 axial, 8-pin, PUR


KRT
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CRT
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LRT
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CRT 20B

Color sensors



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light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

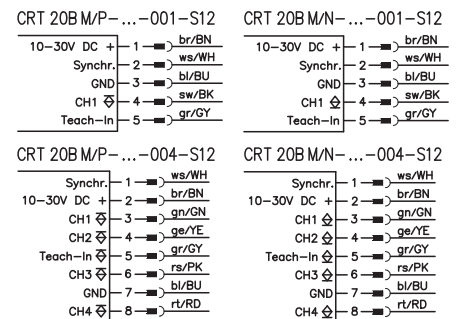
Connection	Option	Accessories
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d



Optical Sensor

- Color sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Color sensor with 1 channel, teach-in of reference color
- 2 Color sensor with 4 channels, teach-in of reference color
- 3 UL approval

COLOR SENSORS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Color sensors with digital output					
CRT 442 K/P - 12 - 001 - S12 50109603	12.5 ± 2mm	24VDC ± 20%	1.5kHz	RGB light 1.5 x 6.5mm ²	1 x PNP
CRT 442 K/N - 12 - 001 - S12 50109602	12.5 ± 2mm	24VDC ± 20%	1.5kHz	RGB light 1.5 x 6.5mm ²	1xNPN

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Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



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CRT
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LRT
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CRT 442
Color sensors



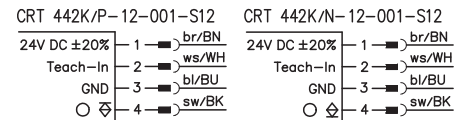
Connection	Option	Accessories
M12 connector	1, 2	a, b, c, d, e, f
M12 connector	1, 2	a, b, c, d, e, f



Optical Sensor

- Color sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Teach-in of reference color
- 2 UL approval

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

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COLOR SENSORS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Color sensors with digital output					
CRT 448.S3 / 444 - M12 50121294	12 ... 32mm ¹⁾	12 ... 28VDC	500Hz	White LED light Ø 4.0mm	3 x PNP
CRT 448.L3 / 444 - M12 50121292	18 ... 22mm	12 ... 28VDC	500Hz	White LED light 1 x 5mm ²	3 x PNP
CRT 448.S3 / 222 - M12 50121293	12 ... 32mm ¹⁾	12 ... 28VDC	500Hz	White LED light Ø 4.0mm	3xNPN
CRT 448.L3 / 222 - M12 50121291	18 ... 22mm	12 ... 28VDC	500Hz	White LED light 1 x 5mm ²	3xNPN

1) Operating range in reflector operation for transparent objects: 50 ... 200mm (with reflector TKS 100x100)

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104591	K - D M12A - 8P - 2m - PUR	Connection cable 2000mm, M12 axial, 8-pin, PUR
b 50104590	K - D M12A - 8P - 5m - PUR	Connection cable 5000mm, M12 axial, 8-pin, PUR
c 50106882	K - D M12A - 8P - 10m - PPU	Connection cable 10000mm, M12 axial, 8-pin, PUR



KRT
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CRT
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LRT
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CRT 448
Color sensors



Connection	Option	Accessories
M12 connector	1, 3, 4, 5, 6	a, b, c
M12 connector	1, 3, 4, 5, 6	a, b, c
M12 connector	2, 3, 4, 5, 6	a, b, c
M12 connector	2, 3, 4, 5, 6	a, b, c



Optical Sensor

- Color sensors Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection

CRT 448.../444-M12		CRT 448.../222-M12	
Synchr.	1 → ws/WH	Synchr.	1 → ws/WH
+UB	2 → br/BN	+UB	2 → br/BN
Ch.1	3 → gn/GN	Ch.1	3 → gn/GN
Ch.2	4 → ge/YE	Ch.2	4 → ge/YE
Key lock	5 → gr/GY	Key lock	5 → gr/GY
Teach-In/Ch.3	6 → rs/PK	Ch.3	6 → rs/PK
GND	7 → bl/BU	GND	7 → bl/BU
NC	8 → rt/RD	NC	8 → rt/RD

Options

- 1 Teach-in of reference color via control buttons and cable teach
- 2 Teach-in of reference color via control buttons
- 3 Switchable pulse stretching
- 4 Synchronization input for the simultaneous activation of several sensors
- 5 Input for activation/deactivation of button lock
- 6 UL approval

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Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

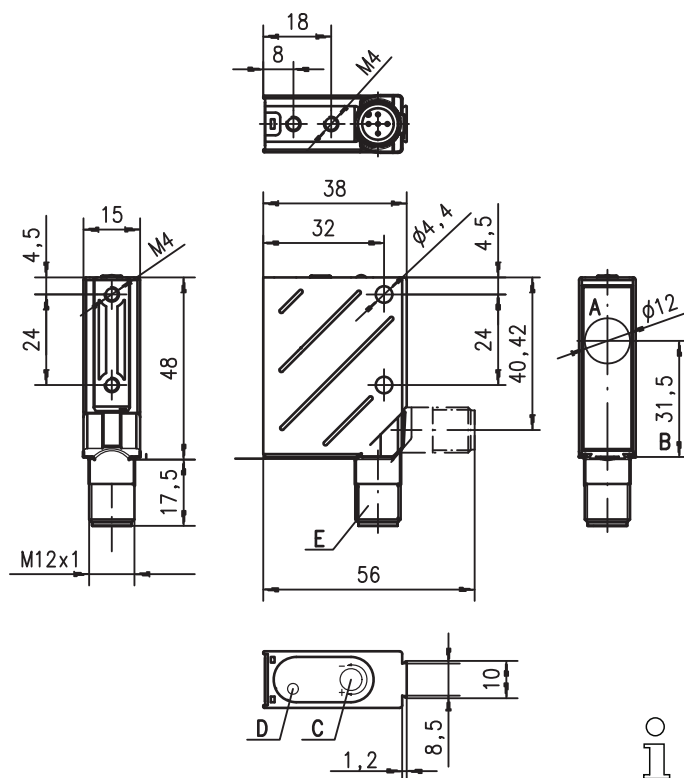
Fiber Optic
Sensors

Light
Curtains


Protective
Sensors

OVERVIEW OF LUMINESCENCE SCANNERS

Dimensioned drawing



- A** Transmitter and receiver
- B** Optical axis
- C** Operational control
- D** Indicator diodes
- E** 90° turning connector

 Further details can be found in the respective data sheet.



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Page 458






CRT
Page 486



LRT
Page 494

LRT 8

Luminescence scanners	Typical scanning ranges	Page
 Luminescence scanner LRT 8	0 ... 500mm	496


Additional products - special sensors:			
	Contrast scanners	KRT... 3B, KRT... 55, KRT... 20	458
	Color sensors	CRT 20B, CRT 442, CRT 448	486



Common technical data		
Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Yellow LED	Obj. detected/Reflection
Mechanical data	Housing	Metal
	Optics cover	Glass
	Weight	70g
Environmental data	Ambient temperature (operation)	$-20^\circ\text{C} \dots +60^\circ\text{C}$
	Protection class	IP 67, IP 69K
	Eye safety (according to EN 62471)	Transmitter 370nm: exempt group transmitter 470nm: risk group 1
	Standards applied	IEC 60947-5-2
Mounting systems for this series can be found from page 629 onwards		

Features

- Detection of luminescent objects and markings
- Various filter options for distinguishing between different-colored luminescences
- Different light-spot sizes
- High switching frequency



Optical Sensor	
● Luminescence scanners	Page 691

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LUMINESCENCE SCANNERS

Part description Part No.:	Typical scanning range	Operating voltage	Switching frequency	Light source	Output
Luminescence scanners					
LRT 8 / 24.04 - 50 - S12 50041840	0 ... 150mm ¹⁾	10 ... 30VDC	1500Hz	UV light, LED	1 x PNP 1 x NPN
LRT 8 / 24.16 - 80 - S12 50116732	0 ... 100mm ²⁾	10 ... 30VDC	1500Hz	UV light, LED	1 x PNP 1 x NPN
LRT 8 / 24.04 - 100 - S12 50109343	0 ... 220mm ¹⁾	10 ... 30VDC	1500Hz	UV light, LED	1 x PNP 1 x NPN
LRT 8 / 24.14 - 150 - S12 50119032	0 ... 400mm ¹⁾	10 ... 30VDC	1500Hz	UV light, LED	1 x PNP 1 x NPN
LRT 8 / 24.10 - 150 - S12 50119033	0 ... 500mm ³⁾	10 ... 30VDC	1500Hz	Blue light, LED	1 x PNP 1 x NPN

1) Object: paper, white, 50mm x 50mm

2) Object: yellow mark 10mm x 30mm on light-colored paper

3) Object: piece of lyra chalk RED 5mm x 30mm

We reserve the right to make changes • LRT_8_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104556	K - D M12W - 5P - 2m - PVC	Connection cable 2000mm, M12 angular, 5-pin, PVC
b 50104555	K - D M12A - 5P - 2m - PVC	Connection cable 2000mm, M12 axial, 5-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
e 50104560	K - D M12W - 5P - 10m - PVC	Connection cable 10000mm, M12 angular, 5-pin, PVC
f 50104559	K - D M12A - 5P - 10m - PVC	Connection cable 10000mm, M12 axial, 5-pin, PVC



KRT
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CRT
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LRT
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LRT 8

Luminescence scanners



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

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Switches

Forked
Sensors

Special
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Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

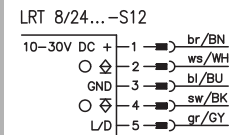
Connection	Option	Accessories
M12 connector	1, 3, 6, 7	a, b, c, d, e, f
M12 connector	1, 2, 4, 5, 7	a, b, c, d, e, f
M12 connector	1, 3, 6, 7	a, b, c, d, e, f
M12 connector	1, 3, 5, 7	a, b, c, d, e, f
M12 connector	1, 2, 5, 7	a, b, c, d, e, f



Optical Sensor

- Luminescence scanners Page 691
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 For detecting red luminescence
- 3 For detecting blue luminescence
- 4 For detecting yellow luminescence
- 5 Small light spot
- 6 Large light spot
- 7 Light/dark switching

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SELECTION TABLE KF SERIES

Operating principle	Scanner	Fastening of the probe	Optical outlet		Laying		Fiber core		Area of application				
			On front	Lateral	Flexible	Highly flexible	Coaxial fiber structure	Multiple fiber core	General applications	Precise object detection	Highly precise object detection	High operating range	
		∅ 2mm											
		∅ 2mm											
		∅ 3mm											
		∅ 3mm											
		3 x M2											
		2 x M2											
		3 x M3											
		2 x ∅ 2.1 mm											
		2 x ∅ 3.2 mm											
		2 x ∅ 3.2 mm											
		2 x ∅ 2.1 mm											
		∅ 3.5mm											
		M4											
		2 x M3											

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FIBER OPTIC SENSORS

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
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cylindrical housing

Measuring
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Sensors

Special
Sensors

































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Sensors

Light
Curtains

Protective
Sensors



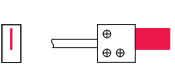


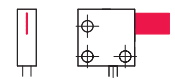


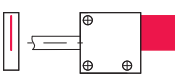

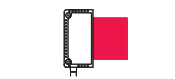

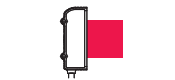


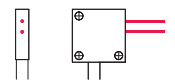


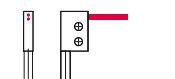

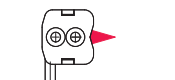

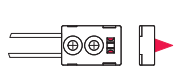



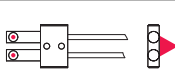


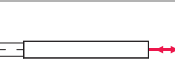
Special characteristics	Fiber length [mm]	Fiber head configuration/image	Typical operating range limit	Type designation Part no.	Details	
						Heat resistant -55 °C ... +105 °C
STAINLESS STEEL	1030			LV463 100	KF-LD-210-32 50117741	508
				LV462 60		
				LV461 35		
STAINLESS STEEL	2015			LV463 54	KF-LE-220 50117738	508
				LV462 30		
				LV461 18		
STAINLESS STEEL	2035			LV463 600	KF-L-320-D-T14L 50117739	508
				LV462 250		
				LV461 200		
STAINLESS STEEL	520			LV463 450	KF-LH-305-D 50117740	508
				LV462 260		
				LV461 150		
BRASS	1010			LV463 360	KF-L-10ML-10 50117742	510
				LV462 210		
				LV461 120		
BRASS	2010			LV463 450	KF-L-10MLD-20 50117743	510
				LV462 260		
				LV461 150		
BRASS	1015			LV463 540	KF-L-15MLD-10 50117744	510
				LV462 310		
				LV461 180		
STAINLESS STEEL	2010			LV463 150	KF-LW-FU57-20 50117745	510
				LV462 85		
				LV461 50		
	2038		LV463 750	KF-L-30ML-20 50117746	512	
			LV462 430			
			LV461 250			
	2055		LV463 750	KF-L-50ML-20 50117747	512	
			LV462 430			
			LV461 250			
STAINLESS STEEL	2007			LV463 40	KF-LW-FU53-20 50117748	512
				LV462 26		
				LV461 15		
STAINLESS STEEL	902		LV463 750	KF-LC32-12 50117749	512	
			LV462 430			
			LV461 250			
STAINLESS STEEL	2008			LV463 750	KF-LY-77TZ-20 50117750	514
				LV462 430		
				LV461 250		
STAINLESS STEEL	2031			LV463 9	KF-LY-U09-20 50117751	514
				LV462 9		
				LV461 9		

SELECTION TABLE KF SERIES

Throughbeam	Scanner	Fastening of the probe	Optical outlet		Laying		Fiber core		Area of application					
			On front	Lateral	Flexible	Highly flexible	Coaxial fiber structure	Multiple fiber core	General applications	Precise object detection	Highly precise object detection	High operating range		
		3 x M2												
		3 x M3												
		3 x M3												
		2 x Ø 3.2mm												
		2 x Ø 3.2mm												
		3 x M3												
		2 x Ø 2.1mm												
		2 x Ø 3.2mm												
		2 x Ø 3.2mm												
		2 x M3												
		Ø 2mm												

We reserve the right to make changes • KF_Auswahl_Applikation_ET_EN.fm

FIBER OPTIC SENSORS

Special characteristics	Fiber length [mm]	Fiber head configuration/image	Typical operating range limit	Type designation Part no.	Details		
						Heat resistant -55°C ... +105°C	Metal probe
	2010			LV463 120	KF-ET-10ML-20 50117727	516	
				LV462 70			
				LV461 40			
	1015			LV463 120	KF-ET-15MLD-20 50117728	516	
				LV462 70			
				LV461 40			
	2020			LV463 210	KF-ET-20MLS-20 50117729	516	
				LV462 120			
				LV461 70			
	2038			LV463 210	KF-ET-30ML-20 50117730	516	
				LV462 120			
				LV461 70			
	2055			LV463 210	KF-ET-50ML-20 50117731	518	
				LV462 120			
				LV461 70			
	2020			LV463 210	KF-ETY-20MLSD-20 50117732	518	
				LV462 120			
				LV461 70			
	2010			LV463 48	KF-ETW-FU47-20 50117733	518	
				LV462 28			
				LV461 16			
	2018			LV463 20	KF-ETW-K10-20 50117734	518	
				LV462 10			
				LV461 10			
	2020			LV463 18	KF-ETB-38V-20 50117735	520	
				LV462 10			
				LV461 6			
		2027			LV463 54	KF-ETH-38H-20 50117736	520
					LV462 30		
					LV461 18		
	2015			LV463 8	KF-ETE-220 50117737	520	
				LV462 5			
				LV461 3			

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains







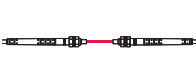

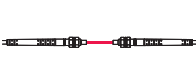





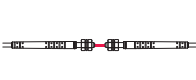











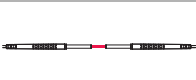

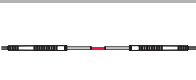


Protective
Sensors

SELECTION TABLE KFX SERIES

Operating principle	Scanner	Optical outlet		Laying		Fiber core		Area of application					
		Fastening of the probe	On front	Lateral	Flexible	Highly flexible	Coaxial fiber structure	Multiple fiber core	General applications	Precise object detection	Highly precise object detection	High operating range	
		M4											
		M4											
		M4											
		M4											
		M3											
		M3											
		M3											
		M3											
		M3											
		M3											
		∅ 2mm											
		∅ 1.5mm											
2 x M3													

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FIBER OPTIC SENSORS

Special characteristics	Fiber length [mm]	Fiber head configuration/image	Typical operating range limit	Type designation Part no.	Details	
						Heat resistant -55 °C ... +105 °C
	2014			LV463 900	KFX-L-420 50117766	522
				LV462 525		
				LV461 300		
	2014			LV463 300	KFX-LD-420 50117767	522
				LV462 175		
				LV461 100		
	2014			LV463 900	KFX-LH-420 50117768	522
				LV462 525		
				LV461 300		
	2014			LV463 900	KFX-LY-420 50117769	522
				LV462 525		
				LV461 300		
	2012			LV463 900	KFX-L-320 50117770	524
				LV462 525		
				LV461 300		
	2012			LV463 300	KFX-LD-320 50117771	524
				LV462 175		
				LV461 100		
	2012			LV463 900	KFX-LH-320 50117772	524
				LV462 525		
				LV461 300		
	2012			LV463 900	KFX-LY-320 50117773	524
				LV462 525		
				LV461 300		
	2015			LV463 900	KFX-L-320-Q 50117774	526
				LV462 525		
				LV461 300		
	2015			LV463 300	KFX-LD-320-Q 50117775	526
				LV462 175		
				LV461 100		
	2015			LV463 60	KFX-LA-220 50117776	526
				LV462 30		
				LV461 20		
	2015			LV463 300	KFX-LD-120 50117777	526
				LV462 175		
				LV461 100		
	2025			LV463 1050	KFX-L-20ML-20 50117778	528
				LV462 600		
				LV461 350		

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors











































Special
Sensors

Fiber Optic
Sensors

Light
Curtains



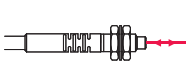


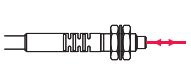


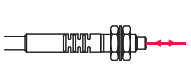


























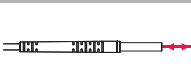


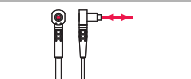

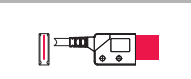
Protective
Sensors

SELECTION TABLE KFX SERIES

Throughbeam	Operating principle	Fastening of the probe	Optical outlet		Laying		Fiber core		Area of application				
			On front	Lateral	Flexible	Highly flexible	Coaxial fiber structure	Multiple fiber core	General applications	Precise object detection	Highly precise object detection	High operating range	
	M6												
	M6												
	M6												
	M4												
	M4												
	M4												
	M3												
	M3												
	M3												
	∅ 3mm												
	∅ 3mm												
	∅ 1.5mm												
	M6												
	2 x M3												

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FIBER OPTIC SENSORS

Special characteristics	Fiber length [mm]	Fiber head configuration/image	Typical operating range limit	Type designation Part no.	Details	
						Heat resistant -55 °C ... +105 °C
	515 / 2015			LV463 240	KFX-ET-605 50121079 KFX-ET-620 50117752	530
				LV462 140		
				LV461 80		
	2015			LV463 270	KFX-ETC-620 50117753	530
				LV462 150		
				LV461 90		
	2015			LV463 240	KFX-ETH-620 50117754	530
				LV462 140		
				LV461 80		
	2019			LV463 14	KFX-ETA-420 50117755	530
				LV462 8		
				LV461 5		
	2019			LV463 90	KFX-ETC-420 50117756	532
				LV462 60		
				LV461 30		
	2019			LV463 70	KFX-ETD-420 50117757	532
				LV462 40		
				LV461 25		
	2019			LV463 14	KFX-ETA-320 50117758	532
				LV462 8		
				LV461 5		
	2019			LV463 90	KFX-ETC-320 50117759	532
				LV462 60		
				LV461 30		
	2019			LV463 70	KFX-ETD-320 50117760	534
				LV462 40		
				LV461 25		
	2016			LV463 90	KFX-ETC-320-Q 50117761	534
				LV462 60		
				LV461 30		
	2016			LV463 70	KFX-ETD-320-Q 50117762	534
				LV462 40		
				LV461 25		
	2019			LV463 60	KFX-ETC7-120 50117763	534
				LV462 35		
				LV461 20		
	2015			LV463 210	KFX-ETY-67TZ-20 50117764	536
				LV462 120		
				LV461 70		
	2025			LV463 210	KFX-ET-20ML-20 50117765	536
				LV462 120		
				LV461 70		

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors



Light
Curtains



Protective
Sensors

KF SERIES

OVERVIEW



Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 60 mm	508
 Diffuse reflection scanners	0 30 mm	516

Additional products - fiber optic sensors:			
	Glass fiber optics	GF series...	538
	Fiber optic amplifier	LV series...	560

Features

- Extensive and highly-specialized range for universal application
- Special fiber types with extraordinary characteristics
- Highly-flexible types for the smallest bending radii
- Extra small cross sections for the detection of very small parts
- V-optics
- Light-bands with active cross section of 5.55 ... 46.5mm

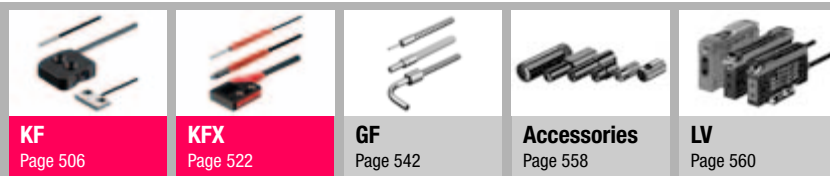
Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Diffuse reflection scanners Page 709



Common technical data		
Mechanical data	Fiber material	PMMA
	Fiber type	Multimode fiber (step index fiber)
	Numerical aperture (NA)	0.5
	Damping at $\lambda = 650\text{nm}$	210dB/km (RH < 95 %)
	Fiber sheathing material	PE
	Weight	4g/m
	Environmental data	Ambient temperature (operation/storage)

Accessories for this series can be found from page 558 onwards




We reserve the right to make changes • KF_KFX_Overview_EN.fm



OVERVIEW

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 60 mm	522
 Diffuse reflection scanners	0 30 mm	530

Additional products - fiber optic sensors:

 	Glass fiber optics	GF series...	538
 	Fiber optic amplifier	LV series...	560

KFX SERIES



Features

- **NEW: high-quality fibers with molded bending protection – prevents fiber breakage on the critical transition point between the head and fiber connection area**
- **Special fiber types with extraordinary characteristics**
- **Highly-flexible types for the smallest bending radii**
- **Extra small cross sections for the detection of very small parts**
- **Coaxial structure for object detection independent from the entry direction**
- **Attachment lenses for focusing the light spot (scanning fiber optics) or for increasing range (throughbeam systems)**

Common technical data

Mechanical data		
Fiber material		PMMA
Fiber type		Multimode fiber (step index fiber)
Numerical aperture (NA)		0.5
Damping at $\lambda = 650\text{nm}$		210dB/km (RH < 95%)
Fiber sheathing material		PE
Bending protection material		PVC 1)
Weight		4g/m

Environmental data		
Ambient temperature (operation/storage)		-55°C ... +70°C

1) corresponds to category 2 ZLS / ZEK 01.2-08

Accessories for this series can be found from page 558 onwards

Fiber optic ABC

- | | |
|-------------------------------|----------|
| ● Plastic fiber optics | Page 706 |
| ● Throughbeam sensors | Page 709 |
| ● Diffuse reflection scanners | Page 709 |

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typical scanning range limits [mm] Total length
KF-LD-210-32 50117741		LV463 0 ... 100 LV462 0 ... 60 LV461 0 ... 35 1030mm, can be shortened ²⁾ Smallest bending radius: R15
KF-LE-220 50117738		LV463 0 ... 54 LV462 0 ... 30 LV461 0 ... 18 2015mm, can be shortened ²⁾ Smallest bending radius: R10
KF-L-320-D-T14L 50117739		LV463 0 600 LV462 0 250 LV461 0 200 2035mm, can be shortened ²⁾ Smallest bending radius: R25
KF-LH-305-D 50117740		LV463 0 450 LV462 0 260 LV461 0 ... 150 520mm, can be shortened ²⁾ Smallest bending radius: R25

1) PU: 2 pieces (transmitter and receiver)
 2) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KF_LS_1_EN.fm



KF SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
Lateral	0.05	Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	1, 4
On front	0.03	Ø 1.0 Ø 0.25 (transmitter) Ø 0.25 (receiver)	2, 4
Lateral	0.1	Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	4
Lateral	0.1	Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	3, 4



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Precise object detection
- 2 Highly precise object detection
- 3 High-temperature version -55°C ... +105°C
- 4 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

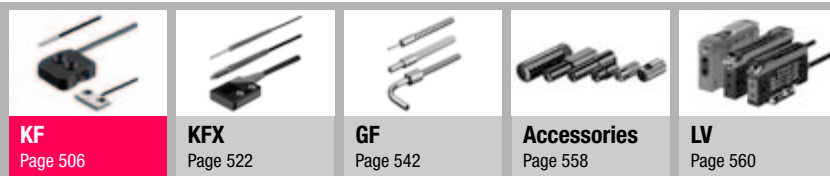
www.leuze.com/en/fiber-optics/

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typical scanning range limits [mm] Total length
KF-L-10ML-10 50117742		LV463 0 360 LV462 0 210 LV461 0 ... 150 1010mm, can be shortened ²⁾ Smallest bending radius: R25
KF-L-10MLD-20 50117743		LV463 0 450 LV462 0 260 LV461 0 ... 150 2010mm, can be shortened ²⁾ Smallest bending radius: R25
KF-L-15MLD-10 50117744		LV463 0 540 LV462 0 310 LV461 0 180 1015mm, can be shortened ²⁾ Smallest bending radius: R25
KF-LW-FU57-20 50117745		LV463 0 ... 150 LV462 0 ... 85 LV461 0 ... 50 2010mm, can be shortened ²⁾ Smallest bending radius: R1

1) PU: 2 pieces (transmitter and receiver)
 2) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KF_LS_2_EN.fm



KF SERIES
Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	1.0	Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	1, 2, 5
Lateral	1.0	Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	1, 2, 5
Lateral	1.0	Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	1, 2, 5
Lateral	0.1	Ø 1.0 Ø 0.5 (transmitter) Ø 0.5 (receiver)	3, 4



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core
- 2 Surface detection, light field detection = 5.44mm
- 3 Highly flexible fiber optics, operating temperature range -40°C ... +70°C
- 4 Stainless steel 1.4305 / AISI 303
- 5 Nickel-faced brass

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

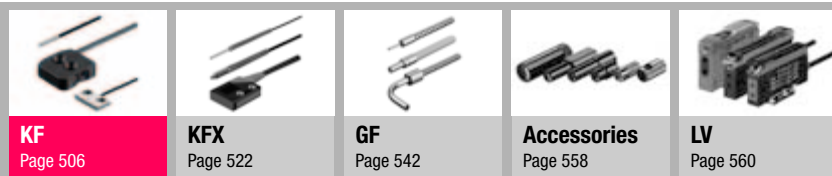
www.leuze.com/en/fiber-optics/

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typical scanning range limits [mm] Total length						
KF-L-30ML-20 50117746		LV463 <table border="1"><tr><td>0</td><td>750</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>430</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>250</td></tr></table> 2038mm, cannot be shortened Smallest bending radius: R60	0	750	0	430	0	250
0	750							
0	430							
0	250							
KF-L-50ML-20 50117747		LV463 <table border="1"><tr><td>0</td><td>750</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>430</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>250</td></tr></table> 2055mm, cannot be shortened Smallest bending radius: R60	0	750	0	430	0	250
0	750							
0	430							
0	250							
KF-LW-FU53-20 50117748		LV463 <table border="1"><tr><td>0 ...</td><td>40</td></tr></table> LV462 <table border="1"><tr><td>0 ...</td><td>26</td></tr></table> LV461 <table border="1"><tr><td>0 ...</td><td>15</td></tr></table> 2007mm, can be shortened ²⁾ Smallest bending radius: R1	0 ...	40	0 ...	26	0 ...	15
0 ...	40							
0 ...	26							
0 ...	15							
KF-LC32-12 50117749		LV463 <table border="1"><tr><td>0</td><td>750</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>430</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>250</td></tr></table> 902mm, cannot be shortened Smallest bending radius: R60	0	750	0	430	0	250
0	750							
0	430							
0	250							

1) PU: 2 pieces (transmitter and receiver)
 2) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KF_LS_3_EN.fm



KF SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
Lateral	1.0	Ø 2.8 32 x Ø 0.25 (transmitter) 32 x Ø 0.25 (receiver)	1, 2
Lateral	2.0	Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	1, 3
Lateral	0.1	Ø 1.0 Ø 0.5 (transmitter) Ø 0.5 (receiver)	4, 5
Lateral	0.1	Ø 2.8 32 x Ø 0.265 (transmitter) 32 x Ø 0.265 (receiver)	1, 5



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core
- 2 Surface detection, light field detection = 24.8mm
- 3 Surface detection, light field detection = 46.5mm
- 4 Highly flexible fiber optics, operating temperature range -40°C ... +70°C
- 5 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

THROUGHBEAM SENSORS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
KF-LY-77TZ-20 50117750 ¹⁾		LV463 0 750 LV462 0 430 LV461 0 250 2008 mm, can be shortened ²⁾ Smallest bending radius: R2
KF-LY-U09-20 50117751		LV463 9 LV462 9 LV461 9 2031 mm, can be shortened ²⁾ Smallest bending radius: R2

1) PU: 2 pieces (transmitter and receiver)
 2) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KF_LS_4_EN.fm



KF SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
Lateral	0.5	Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	1, 3
Lateral	n/a	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	1, 2, 3



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Flexible fiber optics, operating temperature range -40°C ... +70°C
- 2 Forked photoelectric sensor with 9mm mouth width
- 3 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

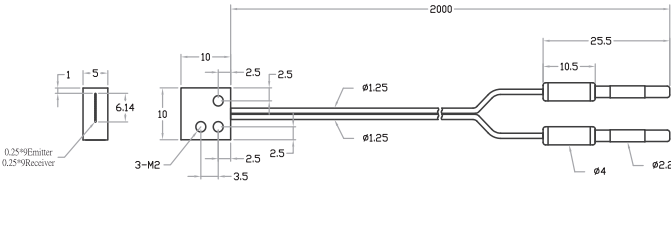
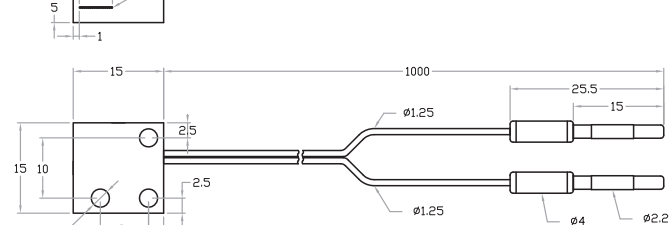
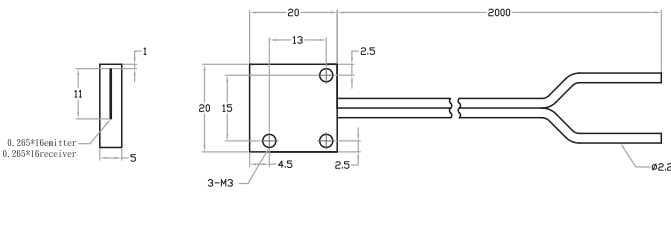
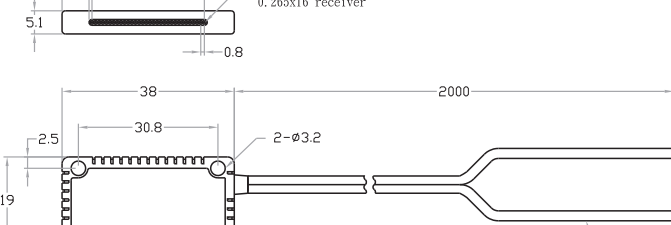
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

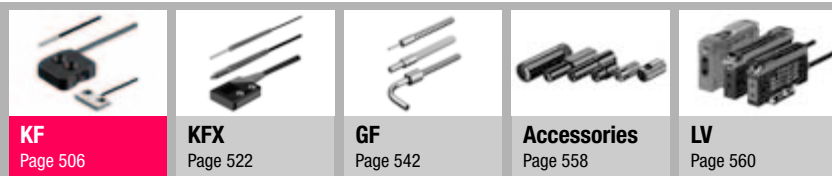
www.leuze.com/en/fiber-optics/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length						
KF-ET-10ML-20 50117727		LV463 <table border="1"><tr><td>0</td><td>120</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>70</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>40</td></tr></table> 2010mm, can be shortened ¹⁾ Smallest bending radius: R25	0	120	0	70	0	40
0	120							
0	70							
0	40							
KF-ET-15MLD-20 50117728		LV463 <table border="1"><tr><td>0</td><td>120</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>70</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>40</td></tr></table> 1015mm, can be shortened ¹⁾ Smallest bending radius: R25	0	120	0	70	0	40
0	120							
0	70							
0	40							
KF-ET-20MLS-20 50117729		LV463 <table border="1"><tr><td>0</td><td>210</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>120</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>70</td></tr></table> 2020mm, can be shortened ¹⁾ Smallest bending radius: R25	0	210	0	120	0	70
0	210							
0	120							
0	70							
KF-ET-30ML-20 50117730		LV463 <table border="1"><tr><td>0</td><td>210</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>120</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>70</td></tr></table> 2038mm, can be shortened ¹⁾ Smallest bending radius: R25	0	210	0	120	0	70
0	210							
0	120							
0	70							

1) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KF_ET_1_EN.fm



KF SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	1.0	2 x Ø 1.25 9 x Ø 0.25 (transmitter) 9 x Ø 0.25 (receiver)	1, 3, 6
Lateral	1.0	2 x Ø 1.25 9 x Ø 0.25 (transmitter) 9 x Ø 0.25 (receiver)	1, 2, 6
On front	1.0	2 x Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	1, 4, 6
Lateral	1.0	2 x Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	1, 5



Fiber optic ABC

- Plastic fiber optics Page 706
- Diffuse reflection scanners Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core
- 2 Surface detection, light field detection = 5.44mm
- 3 Surface detection, light field detection = 6.14mm
- 4 Surface detection, light field detection = 11 mm
- 5 Surface detection, light field detection = 24.8mm
- 6 Nickel-faced brass

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

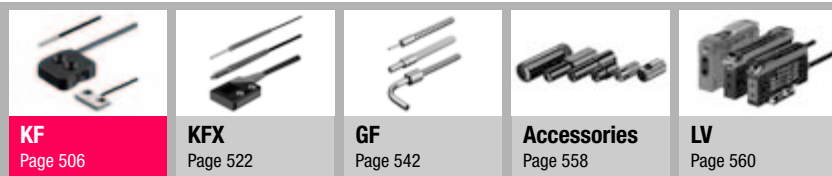
www.leuze.com/en/fiber-optics/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
KF-ET-50ML-20 50117731		LV463 0 ... 210 LV462 0 ... 120 LV461 0 ... 70 2055mm, can be shortened ¹⁾ Smallest bending radius: R25
KF-ETY-20MLSD-20 50117732		LV463 0 ... 210 LV462 0 ... 120 LV461 0 ... 70 2020mm, can be shortened ¹⁾ Smallest bending radius: R2
KF-ETW-FU47-20 50117733		LV463 0 ... 48 LV462 0 ... 28 LV461 0 ... 16 2010mm, can be shortened ¹⁾ Smallest bending radius: R1
KF-ETW-K10-20 50117734		LV463 0 ... 20 LV462 0 ... 10 LV461 0 ... 10 2018mm, can be shortened ¹⁾ Smallest bending radius: R1

1) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KF_ET_2_EN.fm



KF SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
Lateral	2.0	2 x Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	1
Lateral	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	2, 6
Lateral	0.1	2 x Ø 1.0 Ø 0.5 (transmitter) Ø 0.5 (receiver)	3, 5
Lateral	0.1	2 x Ø 1.0 Ø 0.5 (transmitter) Ø 0.5 (receiver)	3, 4



Fiber optic ABC

- Plastic fiber optics Page 706
- Diffuse reflection scanners Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core / surface detection, light field detection = 46.5mm
- 2 Flexible fiber optics, operating temperature range -40°C ... +70°C
- 3 Highly flexible fiber optics, operating temperature range -40°C ... +70°C
- 4 V-optics
- 5 Stainless steel 1.4305 / AISI 303
- 6 Nickel-faced brass

www.leuze.com/en/fiber-optics/

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

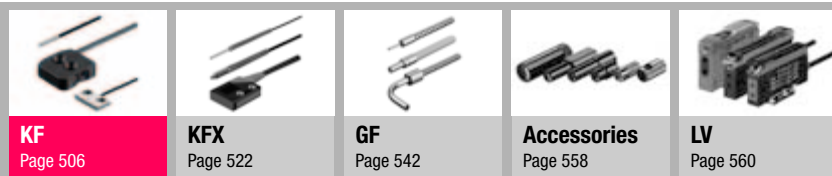
Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
KF-ETB-38V-20 50117735		LV463 0 ... 18 LV462 0 ... 10 LV461 0 ... 6 2020mm, can be shortened ¹⁾ Smallest bending radius: R25
KF-ETH-38H-20 50117736		LV463 0 ... 54 LV462 0 ... 30 LV461 0 ... 18 2027mm, can be shortened ¹⁾ Smallest bending radius: R25
KF-ETE-220 50117737		LV463 0 ... 8 LV462 0 ... 5 LV461 0 ... 3 2015mm, can be shortened ¹⁾ Smallest bending radius: R10

1) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KF_ET_3_EN.fm



KF SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
Lateral	n/a	2 x Ø 1.3 Ø 1.0 (transmitter) Ø 1.0 (receiver)	1
Lateral	n/a	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	1, 2, 5
On front	0.05	2 x Ø 1.0 Ø 0.25 (transmitter) Ø 0.25 (receiver)	3, 4



Fiber optic ABC

- Plastic fiber optics Page 706
- Diffuse reflection scanners Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 V-optics
- 2 High-temperature version -55°C ... +105°C
- 3 Highly precise object detection
- 4 Stainless steel 1.4305 / AISI 303
- 5 Nickel-faced brass

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

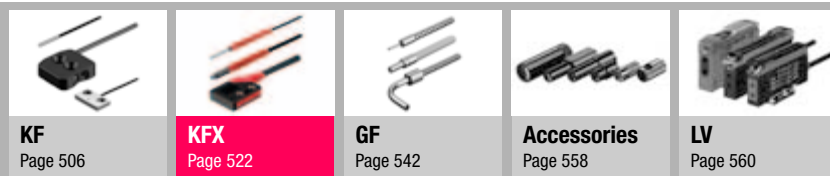
Protective
Sensors

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typical scanning range limits [mm] Total length
KFX-L-420 50117766		LV463 <input type="text" value="0"/> <input type="text" value="900"/> LV462 <input type="text" value="0"/> <input type="text" value="525"/> LV461 <input type="text" value="0"/> <input type="text" value="300"/> 2014mm, can be shortened ²⁾ Smallest bending radius: R25
KFX-LD-420 50117767		LV463 <input type="text" value="0"/> <input type="text" value="300"/> LV462 <input type="text" value="0"/> <input type="text" value="175"/> LV461 <input type="text" value="0"/> <input type="text" value="100"/> 2014mm, can be shortened ²⁾ Smallest bending radius: R15
KFX-LH-420 50117768		LV463 <input type="text" value="0"/> <input type="text" value="900"/> LV462 <input type="text" value="0"/> <input type="text" value="525"/> LV461 <input type="text" value="0"/> <input type="text" value="300"/> 2014mm, can be shortened ²⁾ Smallest bending radius: R25
KFX-LY-420 50117769		LV463 <input type="text" value="0"/> <input type="text" value="900"/> LV462 <input type="text" value="0"/> <input type="text" value="525"/> LV461 <input type="text" value="0"/> <input type="text" value="300"/> 2014mm, can be shortened ²⁾ Smallest bending radius: R2

1) PU: 2 pieces (transmitter and receiver)
 2) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KFX_LS_1_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	4, 5
On front	0.05	2 x Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	1, 4, 5
On front	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	2, 4, 5
On front	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	3, 4, 5



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Precise object detection
- 2 High-temperature version -55°C ... +105°C
- 3 Flexible fiber optics, operating temperature range -40°C ... +70°C
- 4 Adapted for attachment lens KL-SM02, KL-M02, KL-M06
- 5 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

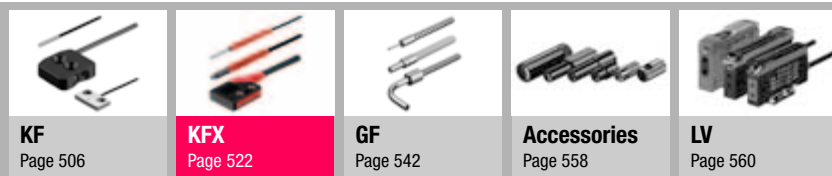
Protective
Sensors

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typical scanning range limits [mm] Total length						
KFX-L-320 50117770		LV463 <table border="1"><tr><td>0</td><td>900</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>525</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>300</td></tr></table> 2012mm, can be shortened ²⁾ Smallest bending radius: R25	0	900	0	525	0	300
0	900							
0	525							
0	300							
KFX-LD-320 50117771		LV463 <table border="1"><tr><td>0</td><td>300</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>... 175</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>... 100</td></tr></table> 2012mm, can be shortened ²⁾ Smallest bending radius: R15	0	300	0	... 175	0	... 100
0	300							
0	... 175							
0	... 100							
KFX-LH-320 50117772		LV463 <table border="1"><tr><td>0</td><td>900</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>525</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>300</td></tr></table> 2012mm, can be shortened ²⁾ Smallest bending radius: R25	0	900	0	525	0	300
0	900							
0	525							
0	300							
KFX-LY-320 50117773		LV463 <table border="1"><tr><td>0</td><td>900</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>525</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>300</td></tr></table> 2012mm, can be shortened ²⁾ Smallest bending radius: R2	0	900	0	525	0	300
0	900							
0	525							
0	300							

1) PU: 2 pieces (transmitter and receiver)
 2) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KFX_LS_2_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	4
On front	0.05	2 x Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	1, 4
On front	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	2, 4
On front	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	3, 4



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Precise object detection
- 2 High-temperature version -55°C ... +105°C
- 3 Flexible fiber optics, operating temperature range -40°C ... +70°C
- 4 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

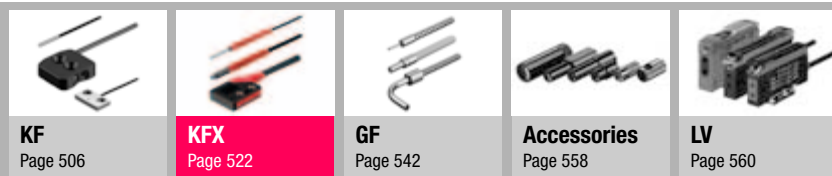
Protective
Sensors

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typical scanning range limits [mm] Total length
KFX-L-320-Q 50117774		LV463 0 900 LV462 0 525 LV461 0 300 2015mm, can be shortened ²⁾ Smallest bending radius: R25
KFX-LD-320-Q 50117775		LV463 0 300 LV462 0 ... 175 LV461 0 ... 100 2015mm, can be shortened ²⁾ Smallest bending radius: R15
KFX-LA-220 50117776		LV463 0 ... 60 LV462 0 ... 30 LV461 0 ... 20 2015mm, can be shortened ²⁾ Smallest bending radius: R10
KFX-LD-120 50117777		LV463 0 300 LV462 0 ... 175 LV461 0 ... 100 2015mm, can be shortened ²⁾ Smallest bending radius: R15

1) PU: 2 pieces (transmitter and receiver)
 2) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KFX_LS_3_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	0.5	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	3
On front	0.05	2 x Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	1, 3
On front	0.03	2 x Ø 1.25 Ø 0.25 (transmitter) Ø 0.25 (receiver)	2, 3
On front	0.05	2 x Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	1, 3



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Precise object detection
- 2 Highly precise object detection
- 3 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

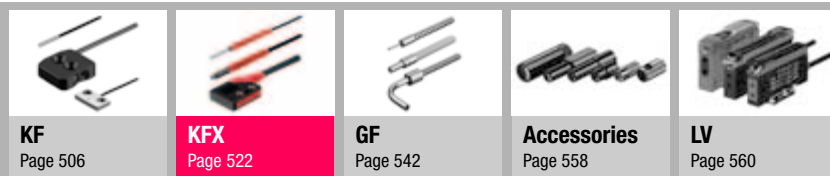
Protective
Sensors

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typical scanning range limits [mm] Total length									
KFX-L-20ML-20 50117778		<table border="1"> <tr> <td>LV463</td> <td>0</td> <td>1050</td> </tr> <tr> <td>LV462</td> <td>0</td> <td>600</td> </tr> <tr> <td>LV461</td> <td>0</td> <td>350</td> </tr> </table> <p>2025mm, cannot be shortened</p> <p>Smallest bending radius: R60</p>	LV463	0	1050	LV462	0	600	LV461	0	350
LV463	0	1050									
LV462	0	600									
LV461	0	350									

1) PU: 2 pieces (transmitter and receiver)

We reserve the right to make changes • KFX_LS_4_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	1.0	2 x Ø 2.8 32 x Ø 0.265 (transmitter) 32 x Ø 0.265 (receiver)	1, 2, 3



Fiber optic ABC

- Plastic fiber optics Page 706
- Throughbeam sensors Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core
- 2 Surface detection, light field detection = 14.5mm
- 3 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

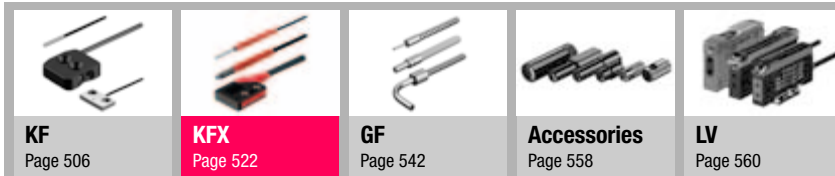
Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
KFX-ET-605 50121079 KFX-ET-620 50117752		LV463 0 ... 240 LV462 0 ... 140 LV461 0 ... 80 515mm (KFX-ET-605), 2015mm (KFX-ET-620), can be shortened ¹⁾ Smallest bending radius: R25
KFX-ETC-620 50117753		LV463 0 ... 270 LV462 0 ... 150 LV461 0 ... 90 2015mm, can be shortened ¹⁾ Smallest bending radius: R25
KFX-ETH-620 50117754		LV463 0 ... 240 LV462 0 ... 140 LV461 0 ... 80 2015mm, can be shortened ¹⁾ Smallest bending radius: R25
KFX-ETA-420 50117755		LV463 0 ... 14 LV462 0 ... 8 LV461 0 ... 5 2019mm, can be shortened ¹⁾ Smallest bending radius: R10

1) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KFX_ET_1_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	0.2	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	5
On front	0.1	2 x Ø 2.2 Ø 1.0 (transmitter) 16 x Ø 0.265 (receiver)	1, 5
On front	0.2	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	2, 5
On front	0.05	2 x Ø 1.25 Ø 0.25 (transmitter) Ø 0.25 (receiver)	3, 4, 5



Fiber optic ABC

- Plastic fiber optics Page 706
- Diffuse reflection scanners Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core with coaxial fiber configuration
- 2 High-temperature version -55°C ... +105°C
- 3 Highly precise object detection
- 4 Adapted for attachment lens KL-M04
- 5 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

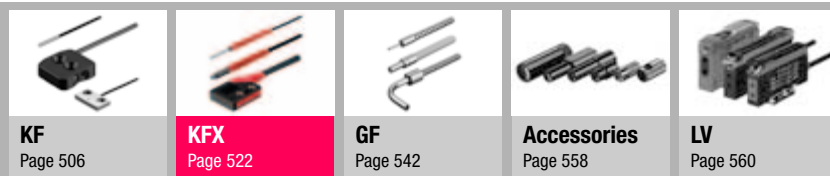
www.leuze.com/en/fiber-optics/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
KFX-ETC-420 50117756		LV463 <input type="checkbox"/> 0 90 LV462 <input type="checkbox"/> 0 60 LV461 <input type="checkbox"/> 0 ... 30 2019mm, can be shortened ¹⁾ Smallest bending radius: R15
KFX-ETD-420 50117757		LV463 <input type="checkbox"/> 0 70 LV462 <input type="checkbox"/> 0 ... 40 LV461 <input type="checkbox"/> 0 ... 25 2019mm, can be shortened ¹⁾ Smallest bending radius: R15
KFX-ETA-320 50117758		LV463 <input type="checkbox"/> 0 ... 14 LV462 <input type="checkbox"/> 0 ... 8 LV461 <input type="checkbox"/> 0 ... 5 2019mm, can be shortened ¹⁾ Smallest bending radius: R10
KFX-ETC-320 50117759		LV463 <input type="checkbox"/> 0 90 LV462 <input type="checkbox"/> 0 60 LV461 <input type="checkbox"/> 0 ... 30 2019mm, can be shortened ¹⁾ Smallest bending radius: R15

1) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KFX_ET_2_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	0.05	2 x Ø 1.25 1 x Ø 0.5 (transmitter) 10 x Ø 0.25 (receiver)	1, 4, 6
On front	0.1	2 x Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	2, 4, 6
On front	0.05	2 x Ø 1.25 Ø 0.25 (transmitter) Ø 0.25 (receiver)	3, 5, 6
On front	0.05	2 x Ø 1.25 1 x Ø 0.5 (transmitter) 10 x Ø 0.25 (receiver)	1, 5, 6



Fiber optic ABC

- Plastic fiber optics Page 706
- Diffuse reflection scanners Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- Multiple fiber core with coaxial fiber configuration
- Precise object detection
- Highly precise object detection
- Adapted for attachment lens KL-M04
- Adapted for attachment lens KL-M03, KL-M03-1
- Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

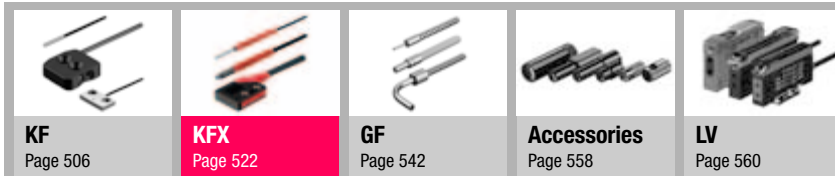
www.leuze.com/en/fiber-optics/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
KFX-ETD-320 50117760		LV463 <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 70 LV462 <input type="checkbox"/> 0 ... 40 LV461 <input type="checkbox"/> 0 ... 25 2019mm, can be shortened ¹⁾ Smallest bending radius: R15
KFX-ETC-320-Q 50117761		LV463 <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 90 LV462 <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 60 LV461 <input type="checkbox"/> 0 ... 30 2016mm, can be shortened ¹⁾ Smallest bending radius: R15
KFX-ETD-320-Q 50117762		LV463 <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 70 LV462 <input type="checkbox"/> 0 ... 40 LV461 <input type="checkbox"/> 0 ... 25 2016mm, can be shortened ¹⁾ Smallest bending radius: R15
KFX-ETC7-120 50117763		LV463 <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 70 LV462 <input type="checkbox"/> 0 ... 40 LV461 <input type="checkbox"/> 0 ... 25 2019mm, can be shortened ¹⁾ Smallest bending radius: R15

1) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KFX_ET_3_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	0.1	2 x Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	1, 3, 4
On front	0.05	2 x Ø 1.25 1 x Ø 0.5 (transmitter) 10 x Ø 0.25 (receiver)	2, 4
On front	0.1	2 x Ø 1.25 Ø 0.5 (transmitter) Ø 0.5 (receiver)	1, 4
On front	0.05	2 x Ø 1.25 1 x Ø 0.25 (transmitter) 6 x Ø 0.25 (receiver)	2, 4



Fiber optic ABC

- Plastic fiber optics Page 706
- Diffuse reflection scanners Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Precise object detection
- 2 Multiple fiber core with coaxial fiber configuration
- 3 Adapted for attachment lens KL-M03, KL-M03-1
- 4 Stainless steel 1.4305 / AISI 303

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Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

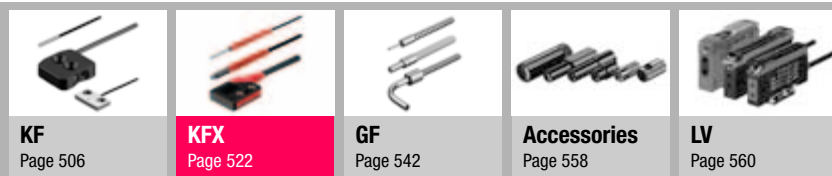
Protective
Sensors

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length						
KFX-ETY-67TZ-20 50117764		LV463 <table border="1"><tr><td>0</td><td>210</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>120</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>70</td></tr></table> 2015mm, can be shortened ¹⁾ Smallest bending radius: R2	0	210	0	120	0	70
0	210							
0	120							
0	70							
KFX-ET-20ML-20 50117765		LV463 <table border="1"><tr><td>0</td><td>210</td></tr></table> LV462 <table border="1"><tr><td>0</td><td>120</td></tr></table> LV461 <table border="1"><tr><td>0</td><td>70</td></tr></table> 2025mm, can be shortened ¹⁾ Smallest bending radius: R25	0	210	0	120	0	70
0	210							
0	120							
0	70							

1) Cutter/bending tool included in delivery contents

We reserve the right to make changes • KFX_ET_4_EN.fm



KFX SERIES

Plastic fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
Lateral	0.2	2 x Ø 2.2 Ø 1.0 (transmitter) Ø 1.0 (receiver)	1, 4
On front	1.0	2 x Ø 2.2 16 x Ø 0.265 (transmitter) 16 x Ø 0.265 (receiver)	2, 3, 4



Fiber optic ABC

- Plastic fiber optics Page 706
- Diffuse reflection scanners Page 709
- Installation Page 707
- Area of appl./characteristics Page 710

Options

- 1 Flexible fiber optics, operating temperature range -40°C ... +70°C
- 2 Multiple fiber core
- 3 Surface detection, light field detection = 14.5mm
- 4 Stainless steel 1.4305 / AISI 303

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors






















Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

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SELECTION TABLE GF SERIES

Operating principle	Scanner	Fastening of the probe	Optical outlet		Laying		Fiber core		Area of application				
			On front	Lateral	Flexible	Highly flexible	Active fiber diameter [mm]	Multiple fiber core	General applications	Precise object detection	Highly precise object detection	High operating range	
Throughbeam	Scanner	Ø 4 mm / Ø 6 mm					Ø 1.14						
		Ø 4 mm / Ø 6 mm					Ø 1.14						
		Ø 4 mm / Ø 6 mm					Ø 1.3						
		Ø 4 mm / Ø 6 mm					Ø 2.28						
		Ø 4 mm / Ø 6 mm					Ø 2.28						
		Ø 4 mm / Ø 6 mm					Ø 2.3						
		Ø 4 mm / Ø 6 mm						Ø 2.3					

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FIBER OPTIC SENSORS

Special characteristics	Fiber length [mm]		Fiber head configuration/image	Typical operating range limit	Type designation	Details
Heat resistant -30 °C ... +200 °C	Fiber sheathing material	Adapted for attachment lens	Fiber optics, can be shortened	in mm with amplifier		on page
	BRASS	LENS	500 ... 1000		LVSR 325 250 GF.../1 LS-MS	544
	STAINLESS STEEL	LENS	500 ... 1000		LVSR 325 250 GF.../1 LS-VA	544
	SILICONE	LENS	500 ... 1000		LVSR 325 250 GF.../1 LS-SI	544
	BRASS	LENS	500 ... 5000		LVSR 325 300 GF.../4 LS-MS	546
	STAINLESS STEEL	LENS	500 ... 5000		LVSR 325 300 GF.../4 LS-VA	546
	SILICONE	LENS	500 ... 3000		LVSR 325 300 GF.../4 LS-SI	548
	SILICONE		800 ... 3000		LVSR 325 300 GF.../4 LS-SI-W.1	548

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors































Special
Sensors

Fiber Optic
Sensors

Light
Curtains






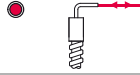

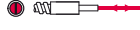



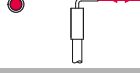






Protective
Sensors

SELECTION TABLE GF SERIES

Throughbeam	Operating principle	Scanner	Fastening of the probe	Optical outlet		Laying		Fiber core		Area of application				
				On front	Lateral	Flexible	Highly flexible	Active fiber diameter [mm]	Multiple fiber core	General applications	Precise object detection	Highly precise object detection	High operating range	
			Ø 3mm / Ø 6.5mm					Ø 1.8						
			Ø 1.5mm / Ø 5mm					Ø 1.0						
			Ø 1.5mm / Ø 6.5mm					Ø 1.0						
			Ø 3mm / Ø 6.5mm					Ø 1.8						
			Ø 3mm / Ø 6.5mm					Ø 1.8						
			Ø 1.5mm / Ø 6mm					Ø 1.0						
			Ø 5.5mm / Ø 6.5mm					Ø 3.5						
			Ø 5.5mm / Ø 8mm					Ø 3.5						
			Ø 5.5mm / Ø 8mm					Ø 3.5						

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FIBER OPTIC SENSORS

Special characteristics	Fiber length [mm]	Fiber head configuration/image	Typical operating range limit	Type designation	Details
	500 ... 1500		LVSR 325 50	GF.../1 RT-MS	550
	600		LVSR 325 20	GF.../1 RT-MS-D5-L10	550
	1000		LVSR 325 20	GF.../1 RT-MS.1	550
	500 ... 1000		LVSR 325 50	GF.../1 RT-VA	550
	500 ... 1000		LVSR 325 50	GF.../1 RT-SI	552
	600		LVSR 325 20	GF.../1 RT-SI-W-1.5	552
	500 ... 6000		LVSR 325 80	GF.../4 RT-MS	554
	500 ... 3500		LVSR 325 80	GF.../4 RT-VA	556
	500 ... 3000		LVSR 325 80	GF.../4 RT-SI	556

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW

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KF
Page 506



KFX
Page 522



GF
Page 542





Accessories
Page 558







LV
Page 560

GF series

Operating principle	Typ. operating range limits	Page
 Throughbeam sensors	0 <input type="text" value="60"/> mm	544
 Diffuse reflection scanners	0 <input type="text" value="30"/> mm	550

Additional products - fiber optic sensors:

 	Plastic fiber optics	KF/KFX series	498
 	Fiber optic amplifier	LVS series	560



Common technical data

Mechanical data	Fiber material	Glass
	Fiber type	Multimode fiber (step index fiber)
	Core diameter	Individual fiber: 50µm
	Ratio Ø core/exterior	95%
	Numerical aperture (NA)	0.54
	Damping at λ = 900nm	700dB/km
Environmental data	Ambient temperature (operation)	Brass sheathing: -30°C ... +200°C
		Stainless steel sheathing: -30°C ... +200°C (for short periods +300°C)
		Silicone sheathing: -30°C ... +180°C (for short periods +200°C)

Accessories for this series can be found from **Page 559** onwards

Features

- **Wide variety of types**
- **Mechanically robust metal sheathing designs, partially from corrosion-proof stainless steel**
- **Use also possible at high temperatures**
- **Special solutions for vacuum-sealed light feed-throughs**



Fiber optic ABC

- Glass fiber optics Page 706
- Throughbeam sensors Page 709
- Diffuse reflection scanners Page 709

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

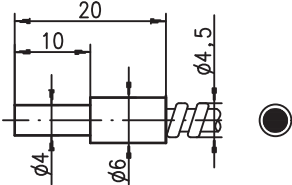
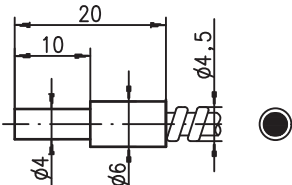
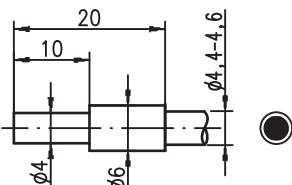
Special
Sensors

Fiber Optic
Sensors

Light
Curtains

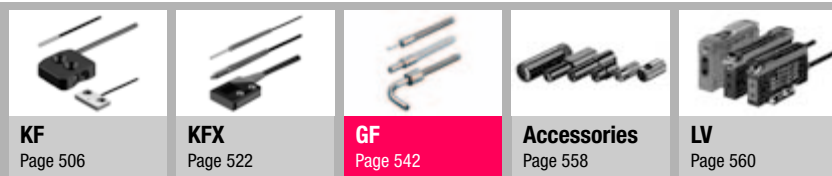
Protective
Sensors

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typ. operating range limits [mm] Total length
GF 500 / 1 LS - MS 50001030 GF 1000 / 1 LS - MS 50001032		LVSR 325 <input type="text" value="0"/> <input type="text" value="250"/> 500 mm, 1000 mm, cannot be shortened Smallest bending radius: R15 (static) R30 (in motion)
GF 500 / 1 LS - VA 50000042 GF 1000 / 1 LS - VA 50000044		LVSR 325 <input type="text" value="0"/> <input type="text" value="250"/> 500 mm, 1000 mm, cannot be shortened Smallest bending radius: R15 (static) R30 (in motion)
GF 500 / 1 LS - SI 50006779 GF 1000 / 1 LS - SI 50000036		LVSR 325 <input type="text" value="0"/> <input type="text" value="250"/> 500 mm, 1000 mm, cannot be shortened Smallest bending radius: R15 (static) R30 (in motion)

1) PU: 2 pieces (transmitter and receiver)

We reserve the right to make changes • GF_LS_1_EN.fm



GF series
Glass fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	n/a	Ø 4.5 Ø 1.14 (transmitter) Ø 1.14 (receiver) Sheathing material: nickel-faced brass	1, 2, 3
On front	n/a	Ø 4.5 Ø 1.14 (transmitter) Ø 1.14 (receiver) Sheathing material: AISI 303 stainless steel (1.4305)	1, 2, 3
On front	n/a	Ø 4.4 ... 4.6 Ø 1.3 (transmitter) Ø 1.3 (receiver) Sheathing material: silicone	1, 2, 3



Fiber optic ABC

- Glass fiber optics Page 706
- Throughbeam sensors Page 709
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core
- 2 Heat resistant
 - Brass: -30°C ... +200°C
 - Stainless steel: -30°C ... +200°C, for short periods +300°C
 - Silicone: -30°C ... +180°C, for short periods +200°C
- 3 Adapted for attachment lens GF-L1 or 90° deflection GF-U1

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

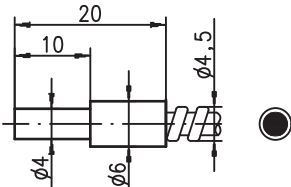
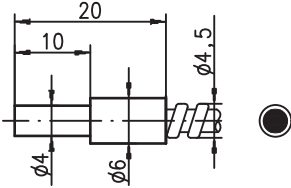
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

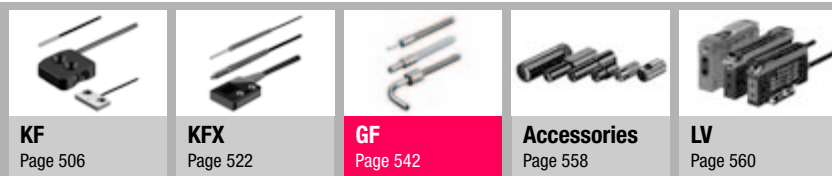
www.leuze.com/en/fiber-optics/

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typ. operating range limits [mm] Total length
GF 500 / 4 LS - MS 50001031 GF 1000 / 4 LS - MS 50001033 GF 1500 / 4 LS - MS 50021192 GF 2000 / 4 LS - MS 50000051 GF 3000 / 4 LS - MS 50024604		LVSR 325 <input type="text" value="0"/> <input type="text" value="300"/> 500 1000mm, 1500mm, 2000mm, 3000mm, cannot be shortened Smallest bending radius: R15 (static) R30 (in motion)
GF 500 / 4 LS - VA 50000043 GF 1000 / 4 LS - VA 50000045 GF 1500 / 4 LS - VA 50018698 GF 2000 / 4 LS - VA 50009331 GF 3000 / 4 LS - VA 50039145 GF 5000 / 4 LS - VA 50022139		LVSR 325 <input type="text" value="0"/> <input type="text" value="300"/> 500 1000 1500mm, 2000mm, 3000mm, 5000mm, cannot be shortened Smallest bending radius: R15 (static) R30 (in motion)

1) PU: 2 pieces (transmitter and receiver)

We reserve the right to make changes • GF_LS_2_EN.fm



GF series
Glass fiber optics



Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	n/a	Ø 4.5 Ø 2.28 (transmitter) Ø 2.28 (receiver) Sheathing material: nickel-faced brass	1, 2, 3
On front	n/a	Ø 4.5 Ø 2.28 (transmitter) Ø 2.28 (receiver) Sheathing material: AISI 303 stainless steel (1.4305)	1, 2, 3



Fiber optic ABC

- Glass fiber optics Page 706
- Throughbeam sensors Page 709
- Area of appl./characteristics Page 710

Options

- 1 Multiple fiber core
- 2 Heat resistant
 - Brass: -30°C ... +200°C
 - Stainless steel: -30°C ... +200°C, for short periods +300°C
 - Silicone: -30°C ... +180°C, for short periods +200°C
- 3 Adapted for attachment lens GF-L1 or 90° deflection GF-U1

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

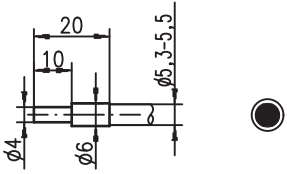
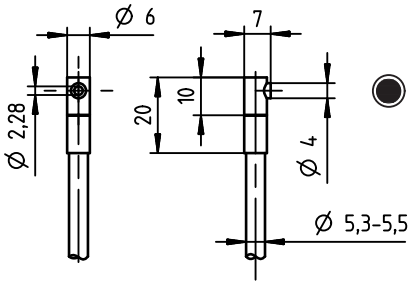
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

www.leuze.com/en/fiber-optics/

THROUGHBEAM SENSORS

Part description Part no.: ¹⁾	Dimensioned drawing	Typ. operating range limits [mm] Total length
GF 500 / 4 LS - SI 50000035 GF 1000 / 4 LS - SI 50000037 GF 2000 / 4 LS - SI 50041611 GF 3000 / 4 LS - SI 50036128		LVSR 325 <input type="text" value="0"/> <input type="text" value="300"/> 500 mm, 1000 mm, 2000 mm, 3000 mm, cannot be shortened Smallest bending radius: R20 (static) R40 (in motion)
GF 800 / 4 LS - SI - W.1 50034437 GF 1000 / 4 LS - SI - W.1 50102497 GF 1500 / 4 LS - SI - W.1 50105120 GF 2000 / 4 LS - SI - W.1 50121080 GF 3000 / 4 LS - SI - W.1 50121081		LVSR 325 <input type="text" value="0"/> <input type="text" value="300"/> 800 mm, 1000 mm, 1500 mm, 2000 mm, 3000 mm, cannot be shortened Smallest bending radius: R20 (static) R40 (in motion)

1) PU: 2 pieces (transmitter and receiver)

We reserve the right to make changes • GF_LS_3_EN.fm



GF series
Glass fiber optics



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	n/a	Ø 5.3 ... 5.5 Ø 2.3 (transmitter) Ø 2.3 (receiver) Sheathing material: silicone	1, 2, 3
Lateral	n/a	Ø 5.3 ... 5.5 Ø 2.3 (transmitter) Ø 2.3 (receiver) Sheathing material: silicone	1, 2



Fiber optic ABC

- Glass fiber optics Page 706
- Throughbeam sensors Page 709
- Area of appl./characteristics Page 710

Options

- Multiple fiber core
- Heat resistant
 - Brass: -30°C ... +200°C
 - Stainless steel: -30°C ... +200°C, for short periods +300°C
 - Silicone: -30°C ... +180°C, for short periods +200°C
- Adapted for attachment lens GF-L1 or 90° deflection GF-U1

www.leuze.com/en/fiber-optics/

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
GF 500/1 RT-MS 50001034 GF 1000/1 RT-MS 50001036 GF 1500/1 RT-MS 50019341		LVSR 325 <input type="checkbox"/> 0 50 500 1000mm, 1500mm, cannot be shortened Smallest bending radius: R20 (static) R40 (in motion)
GF 600/1 RT-MS-D5-L10 50105340		LVSR 325 <input type="checkbox"/> 0 ... 20 600mm, cannot be shortened Smallest bending radius: R15 (static) R30 (in motion)
GF 1000/1 RT-MS.1 50011508		LVSR 325 <input type="checkbox"/> 0 ... 20 1000mm, cannot be shortened Smallest bending radius: R20 (static) R40 (in motion)
GF 500/1 RT-VA 50000046 GF 1000/1 RT-VA 50000048		LVSR 325 <input type="checkbox"/> 0 50 500mm, 1000mm, cannot be shortened Smallest bending radius: R20 (static) R40 (in motion)

We reserve the right to make changes • GF_ET_1_EN.fm



GF series
Glass fiber optics



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	n/a	Ø 6 Ø 1.8 (transmitter + receiver) Sheathing material: nickel-faced brass	1, 2
On front	n/a	Ø 4.5 Ø 1.0 (transmitter + receiver) Sheathing material: nickel-faced brass	1, 2
Lateral	n/a	Ø 6.5 Ø 1.0 (transmitter + receiver) Sheathing material: nickel-faced brass	1, 2
On front	n/a	Ø 6 Ø 1.8 (transmitter + receiver) Sheathing material: AISI 303 stainless steel (1.4305)	1, 2



Fiber optic ABC

- Glass fiber optics Page 706
- Diffuse reflection scanners Page 709
- Area of appl./characteristics Page 710

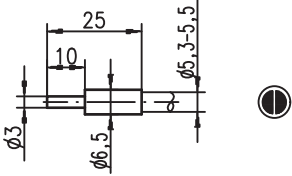
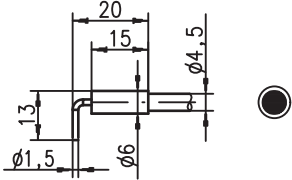
Options

- Multiple fiber core
- Heat resistant

Brass:	-30°C ... +200°C
Stainless steel:	-30°C ... +200°C, for short periods +300°C
Silicone:	-30°C ... +180°C, for short periods +200°C

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DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
GF 500 / 1 RT - SI 50000038 GF 1000 / 1 RT - SI 50000040		LVSR 325 <input type="checkbox"/> 0 50 500 mm, 1000 mm, cannot be shortened Smallest bending radius: R20 (static) R40 (in motion)
GF 600/1 RT-Si-W-1.5 50034368		LVSR 325 <input type="checkbox"/> 0 ... 20 600 mm, cannot be shortened Smallest bending radius: R15 (static) R30 (in motion)

We reserve the right to make changes • GF_ET_2_EN.fm



GF series
Glass fiber optics



Photoel. sensors/
light scanners,
cubic housing

Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	n/a	Ø 5.3 ... 5.5 Ø 1.8 (transmitter + receiver) Sheathing material: silicone	1, 2
Lateral	n/a	Ø 4.5 Ø 1.0 (transmitter + receiver) Sheathing material: silicone	1, 2



Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Fiber optic ABC

- Glass fiber optics Page 706
- Diffuse reflection scanners Page 709
- Area of appl./characteristics Page 710

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

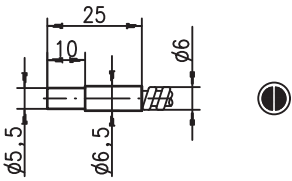
Light
Curtains

Protective
Sensors

Options

- 1 Multiple fiber core
- 2 Heat resistant
 - Brass: -30°C ... +200°C
 - Stainless steel: -30°C ... +200°C, for short periods +300°C
 - Silicone: -30°C ... +180°C, for short periods +200°C

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
GF 500/4 RT-MS 50001035		LVSR 325 0 80
GF 1000/4 RT-MS 50001037		500
GF 1500/4 RT-MS 50023019		1000
GF 2000/4 RT-MS 50000053		1500
GF 2500/4 RT-MS 50039392		2000
GF 3000/4 RT-MS 50022551		2500 mm,
GF 5000/4 RT-MS 50105274		3000 mm,
GF 6000/4 RT-MS 50041477		5000 mm, 6000 mm, cannot be shortened
		Smallest bending radius: R20 (static) R40 (in motion)

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GF series
Glass fiber optics



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	n/a	Ø 6 Ø 3.5 (transmitter + receiver) Sheathing material: nickel-faced brass	1, 2



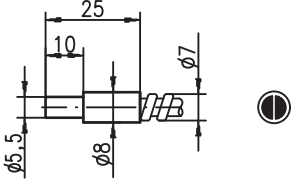
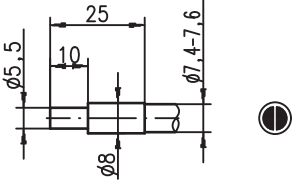
Fiber optic ABC

- Glass fiber optics Page 706
- Diffuse reflection scanners Page 709
- Area of appl./characteristics Page 710

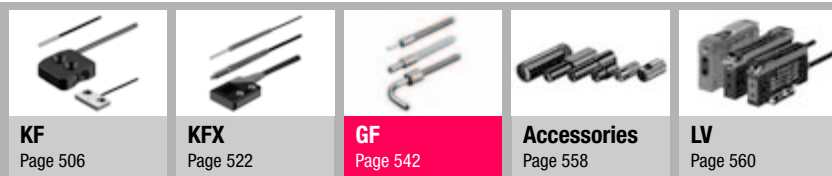
Options

- | | | |
|---|---------------------|--|
| 1 | Multiple fiber core | |
| 2 | Heat resistant | Brass: -30°C ... +200°C
Stainless steel: -30°C ... +200°C, for short periods +300°C
Silicone: -30°C ... +180°C, for short periods +200°C |

DIFFUSE REFLECTION SCANNERS

Part description Part No.:	Dimensioned drawing	Typical scanning range limits [mm] Total length
GF 500 / 4 RT - VA 50000047 GF 1000 / 4 RT - VA 50000049 GF 1500 / 4 RT - VA 50010567 GF 2000 / 4 RT - VA 50000054 GF 2500 / 4 RT / VA 50041741 GF 3500 / 4 RT / VA 50041742		LVSR 325 0 80 500 1000 1500mm, 2000mm, 2500mm, 3500mm, cannot be shortened Smallest bending radius: R25 (static) R50 (in motion)
GF 500 / 4 RT - SI 50000039 GF 1000 / 4 RT - SI 50000041 GF 2000 / 4 RT - SI 50010820 GF 3000 / 4 RT - SI 50060384		LVSR 325 0 80 500mm, 1000mm, 2000mm, 3000mm, cannot be shortened Smallest bending radius: R25 (static) R50 (in motion)

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GF series
Glass fiber optics



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Optical outlet	Smallest part [mm]	Outer diameter [mm] Active fiber diameter [mm]	Option
On front	n/a	Ø 7 Ø 3.5 (transmitter + receiver) Sheathing material: AISI 303 stainless steel (1.4305)	1, 2
On front	n/a	Ø 7.4 ... 7.6 Ø 3.5 (transmitter + receiver) Sheathing material: silicone	1, 2



Fiber optic ABC

- Glass fiber optics Page 706
- Diffuse reflection scanners Page 709
- Area of appl./characteristics Page 710

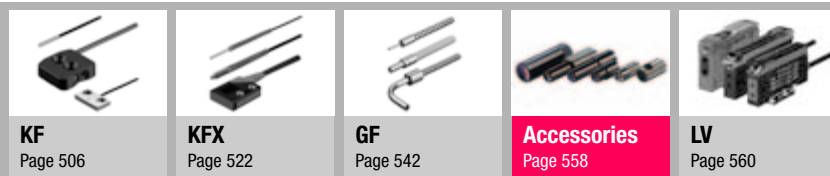
Options

- | | | |
|---|---------------------|--|
| 1 | Multiple fiber core | |
| 2 | Heat resistant | Brass: -30°C ... +200°C
Stainless steel: -30°C ... +200°C, for short periods +300°C
Silicone: -30°C ... +180°C, for short periods +200°C |

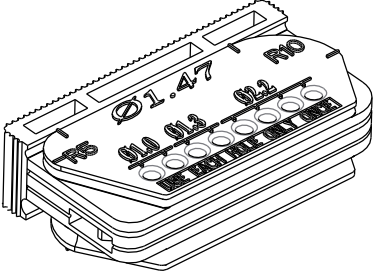
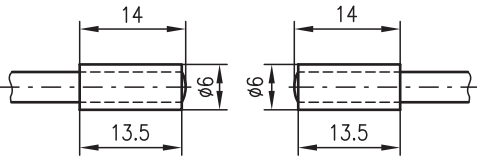
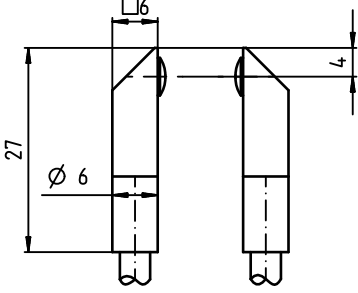
ACCESSORIES / FIBER OPTICS

Dimensioned drawing	Part description Part No.:	Feature
Attachment lens for KFX plastic fiber optics		
	<p>KL-M02 50117779</p> <p>PU = 2 pieces</p>	<p>Lens for extending range in throughbeam systems, enables max. 4-fold range when applied, screw-on mounting</p> <p>Only for KFX-L...-420, KF-LY-77TZ-20!</p>
	<p>KL-M06 50117784</p> <p>PU = 2 pieces</p>	<p>Lens for extending range in throughbeam systems, enables max. 8-fold range when applied, screw-on mounting</p> <p>Only for KFX-L...-420, KF-LY-77TZ-20!</p>
	<p>KL-M03 50117780</p>	<p>Lens for focusing light spot for scanning plastic fiber optics, light spot \varnothing 0.5 mm at a distance of 8 mm, screw-on mounting</p> <p>Only for KFX-ET...-320!</p>
	<p>KL-M03-1 50117783</p>	<p>Lens for focusing light spot for scanning plastic fiber optics, light spot \varnothing 2 mm at a distance of 8 mm, screw-on mounting</p> <p>Only for KFX-ET...-320!</p>
	<p>KL-M04 50117781</p>	<p>Lens for focusing light spot for scanning plastic fiber optics, light spot \varnothing 0.7 mm at a distance of 10 mm, screw-on mounting</p> <p>Only for KFX-ET...-420!</p>
	<p>KL-SM02 50117782</p> <p>PU = 2 pieces</p>	<p>Lens for light beam deflection for throughbeam systems, angles of beam deflection = 90° to optical inlet, screw-on mounting</p> <p>Only for KFX-L...-420, KF-LY-77TZ-20!</p>

We reserve the right to make changes • FOS_Accessories_1_EN.fm



ACCESSORIES / FIBER OPTICS

Dimensioned drawing	Part description Part No.:	Feature
Cutter/bending tool for plastic fiber optics		
	<p>KLC-4530 50117785</p> <p>PU = 5 pieces</p>	<p>Combined tool for cutting and bending plastic fiber optics</p>
Optic attachments for glass fiber optics		
	<p>GF-L1 50014649</p>	<p>Attachment lenses for glass fiber throughbeam systems, adhesive mounting</p>
	<p>GF-U1 50009382</p>	<p>90° deflection for glass fiber throughbeam systems, adhesive mounting</p>

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

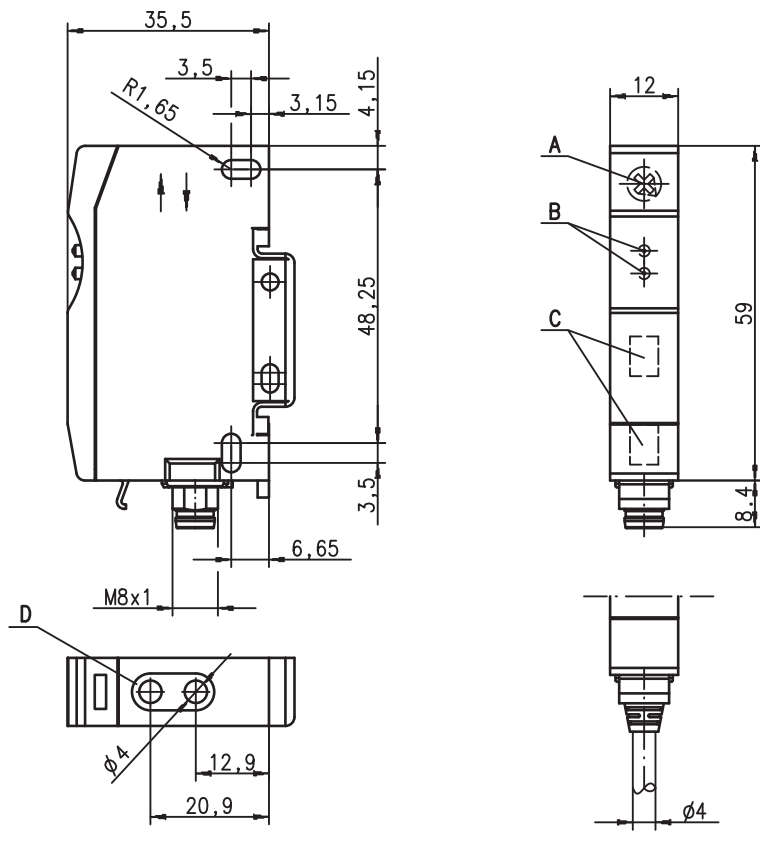
Protective
Sensors

OVERVIEW OF FIBER OPTIC AMPLIFIERS

Dimensioned drawing



Further details can be found in the respective data sheet.



We reserve the right to make changes • LVSR325_Overview_EN.fim



LVSR 325

Fiber optic amplifiers	Fiber optics	Page
 Fiber optic amplifier LVSR 325	Glass fiber	562

Additional products:

 Fiber optic amplifier	LV461	564
 Fiber optic amplifier	LV462	568
 Fiber optic amplifier	LV463	572
 Glass fiber optics	GF	538
 Plastic fiber optics	KF	498



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 25\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready/Teach-in
	Yellow LED	Switching output
	Red LED	Performance res./Teach-in
Mechanical data	Housing	Plastic
	Fiber optic connection	Screw connection
	Weight (without cable)	30g
Environmental data	Ambient temperature (operation)	$-20^\circ\text{C} \dots +70^\circ\text{C}$
	Protection class	IP 65

Features

- For glass fiber optics
- Teach-in for optimum sensitivity adjustment
- Activation or teach input
- Warning output



Fiber optic ABC

- Glass fiber optics Page 706

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

FIBER OPTIC AMPLIFIERS

Part description Part No.:	Fiber optics	Light source	Output	Switching
Fiber optic amplifiers for glass fiber optics				
LVSr 325 K / P - 402 - S8 50081301	Glass fiber GF, Ø 4 mm	Red light	PNP	Light/dark configurable
LVSr 325 K / P - 401 50081300	Glass fiber GF, Ø 4 mm	Red light	PNP	Light/dark configurable
LVSr 325 K / N - 402 - S8 50033578	Glass fiber GF, Ø 4 mm	Red light	NPN	Light/dark configurable
LVSr 325 K / N - 401 50033580	Glass fiber GF, Ø 4 mm	Red light	NPN	Light/dark configurable

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Accessories / connection cables		More accessories can be found from page 648 onwards
Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104529	K - D M8W - 4P - 10m - PVC	Connection cable 10000mm, M8 angular, 4-pin, PVC
f 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC



LVSr 325

Fiber optic amplifiers

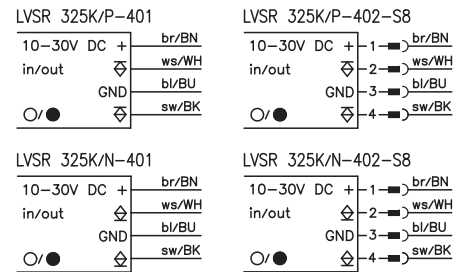
Connection	Option	Accessories
M8 connector	1	a, b, c, d, e, f
Cable, 2 m	1	
M8 connector	1	a, b, c, d, e, f
Cable, 2 m	1	



Fiber optic ABC

- Glass fiber optics Page 706

Electrical connection



Options

- 1 Teach-in via buttons

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

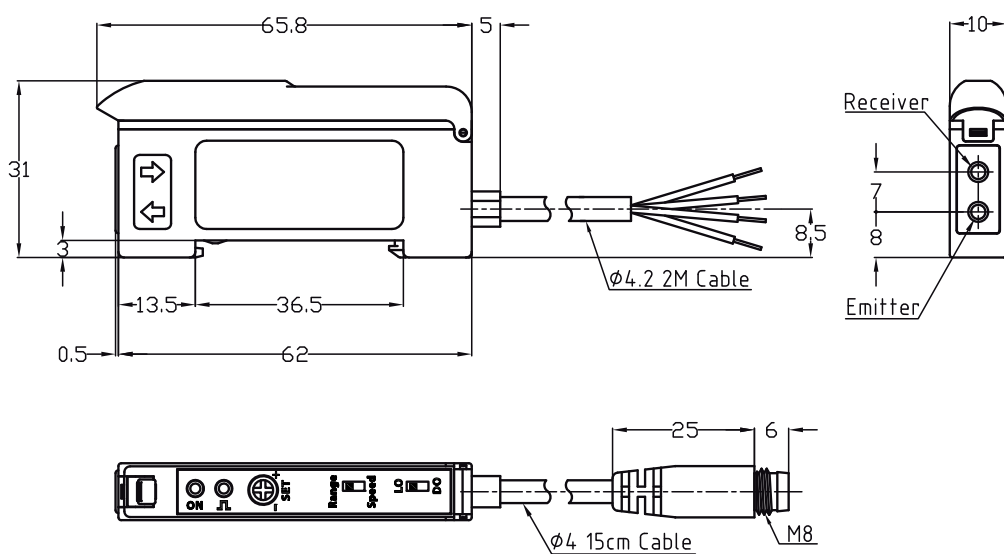
Fiber Optic
Sensors


Light
Curtains

Protective
Sensors

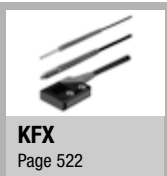
OVERVIEW OF FIBER OPTIC AMPLIFIERS

Dimensioned drawing

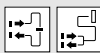


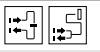
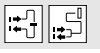
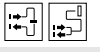


 Further details can be found in the respective data sheet.

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LV461

Fiber optic amplifiers	Fiber optics	Page
 Fiber optic amplifier LV461	KF / KFX	566


Additional products:		
 Fiber optic amplifier	LVSR 325	560
 Fiber optic amplifier	LV462	568
 Fiber optic amplifier	LV463	572
 Glass fiber optics	GF	538
 Plastic fiber optics	KF	498



Common technical data		
Electrical data	Operating voltage U_B	12 ... 24VDC \pm 10%
	Residual ripple	\leq 10% of U_B
	Open-circuit current	\leq 40mA
	Signal voltage high/low	$\geq (U_B - 2V) / \leq 2V$
Indicators	Green LED	Ready to operate
	Red LED	Switching output active
Mechanical data	Housing	Plastic (ABS)
	Fiber optic connection	Clamp
	Weight (with cable)	35g
Environmental data	Ambient temperature (operation)	-10°C ... +60°C
	Protection class	IP 54
	Standards applied	IEC 60947-5-2

Features

- For plastic fiber optics
- 1 x PNP and 1 x NPN switching output each, antivalent switching
- Switch for changing between light and dark switching
- Switch for changing between short response time or higher range
- 20-turn potentiometer for sensitivity adjustment for optimal adjustment to the application
- Operation and switching output indicator diode



Fiber optic ABC	
● Plastic fiber optics	Page 706
● Fiber optic installation	Page 707

www.leuze.com/en/fiber-optics/

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

FIBER OPTIC AMPLIFIERS

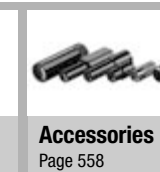
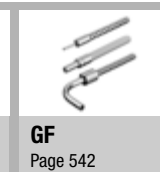
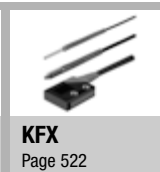
Part description Part No.:	Fiber optics	Light source	Output	Switching
Fiber optic amplifiers for plastic fiber optics				
LV 461.1 / P2 50118398	Plastic KF/KFX, Ø 2.2mm	Red light	1 x PNP/DC 1 x NPN/DC	Light/dark reversible
LV 461.1 / P2 - 150 - M8 50118399	Plastic KF/KFX, Ø 2.2mm	Red light	1 x PNP/DC 1 x NPN/DC	Light/dark reversible

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104529	K - D M8W - 4P - 10m - PVC	Connection cable 10000mm, M8 angular, 4-pin, PVC
f 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC



LV461

Fiber optic amplifiers

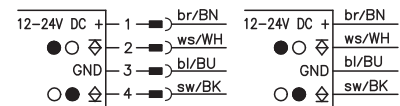
Connection	Option	Accessories
Cable, 2m	1	
Cable, 150mm with M8 connector 4-pin	1, 2	a, b, c, d, e, f



Fiber optic ABC

- Plastic fiber optics Page 706
- Fiber optic installation Page 707

Electrical connection



Options

- 1 Sensitivity adjustment via 20-turn potentiometer
- 2 Selector switch for 'Range' / 'Speed' operating mode

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

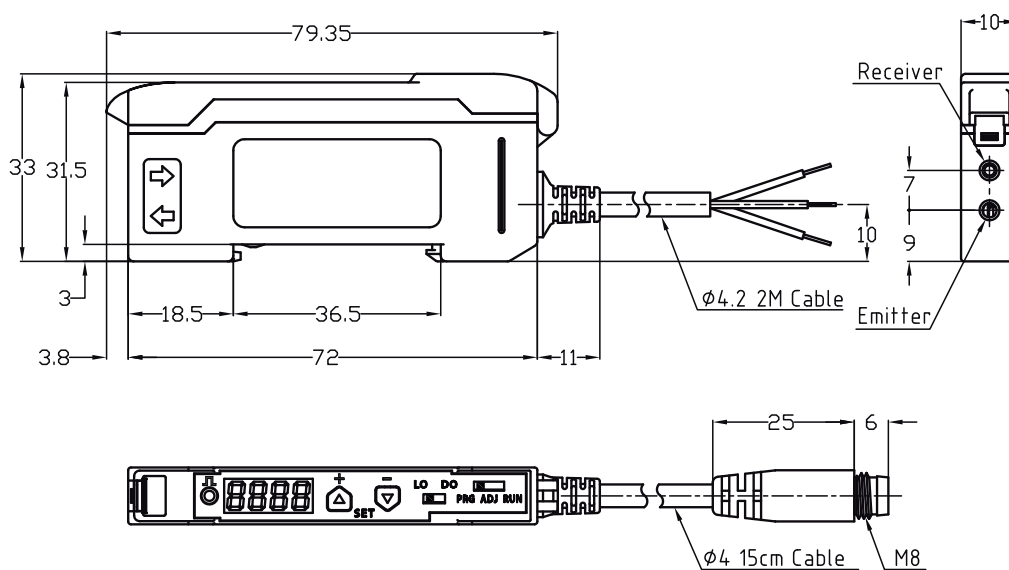
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors






OVERVIEW OF FIBER OPTIC AMPLIFIERS

Dimensioned drawing



i Further details can be found in the respective data sheet.

We reserve the right to make changes • LV462_Overview_EN.fm

				
KF Page 506	KFX Page 522	GF Page 542	Accessories Page 558	LV Page 560

LV462

Fiber optic amplifiers	Fiber optics	Page
 Fiber optic amplifier LV462	KF / KFX	570

Additional products:

 Fiber optic amplifier	LVSR 325	560
 Fiber optic amplifier	LV461	564
 Fiber optic amplifier	LV463	572
 Glass fiber optics	GF	538
 Plastic fiber optics	KF	498



Common technical data

Electrical data	Operating voltage U_B	12 ... 24VDC \pm 10%
	Residual ripple	\leq 10% of U_B
	Open-circuit current	\leq 45mA
	Signal voltage high/low	$\geq (U_B - 2V) / \leq 2V$
Indicators	Green LED	Ready to operate
	Yellow LEDs	Switching output active
	Display	7-segment, 4-digit
Mechanical data	Housing	Plastic (ABS)
	Fiber optic connection	Clamp
	Weight (with cable)	63g
Environmental data	Ambient temperature (operation)	-10°C ... +60°C
	Protection class	IP 54
	Standards applied	IEC 60947-5-2

Features

- For plastic fiber optics
- 3-digit display for showing/ adjusting the switching threshold
- NEW: AutoSet function for easy sensor adjustment
- Menu functions for adjusting ranges and different time functions
- PNP or NPN switching output
- Switch for changing between light and dark switching
- Operation and switching output indicator diode



Fiber optic ABC

- Plastic fiber optics Page 706
- Fiber optic installation Page 707

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains



Protective
Sensors

FIBER OPTIC AMPLIFIERS

Part description Part No.:	Fiber optics	Light source	Output	Switching
Fiber optic amplifiers for plastic fiber optics				
LV462.4 / 4 50118400	Plastic KF/KFX, Ø 2.2mm	Red light	1 x PNP/DC	Light/dark reversible
LV462.4 / 4X - 150 - M8 50118401	Plastic KF/KFX, Ø 2.2mm	Red light	1 x PNP/DC	Light/dark reversible
LV462.4 / 2 50118402	Plastic KF/KFX, Ø 2.2mm	Red light	1 x NPN/DC	Light/dark reversible
LV462.4 / 2X - 150 - M8 50118403	Plastic KF/KFX, Ø 2.2mm	Red light	1 x NPN/DC	Light/dark reversible

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Accessories / connection cables		More accessories can be found from page 634 onwards	
Part no.	Designation	Features	
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC	
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC	
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC	
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC	
e 50104529	K - D M8W - 4P - 10m - PVC	Connection cable 10000mm, M8 angular, 4-pin, PVC	
f 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC	

				
KF Page 506	KFX Page 522	GF Page 542	Accessories Page 558	LV Page 560

LV462

Fiber optic amplifiers

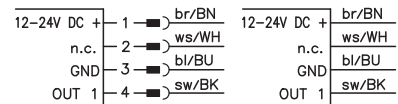
Connection	Option	Accessories
Cable, 2m	1, 2, 3, 4	
Cable, 150mm with M8 connector 4-pin	1, 2, 3, 4	a, b, c, d, e, f
Cable, 2m	1, 2, 3, 4	
Cable, 150mm with M8 connector 4-pin	1, 2, 3, 4	a, b, c, d, e, f



Fiber optic ABC

- Plastic fiber optics Page 706
- Fiber optic installation Page 707

Electrical connection



Options

- 1 3-digit display for showing/adjusting the switching threshold
- 2 Selector switch for 'Range' / 'Speed' operating mode
- 3 Menu-driven sensor adjustment using display and +/- buttons
- 4 Time functions configurable (switch-on/off delay, pulse contact)

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

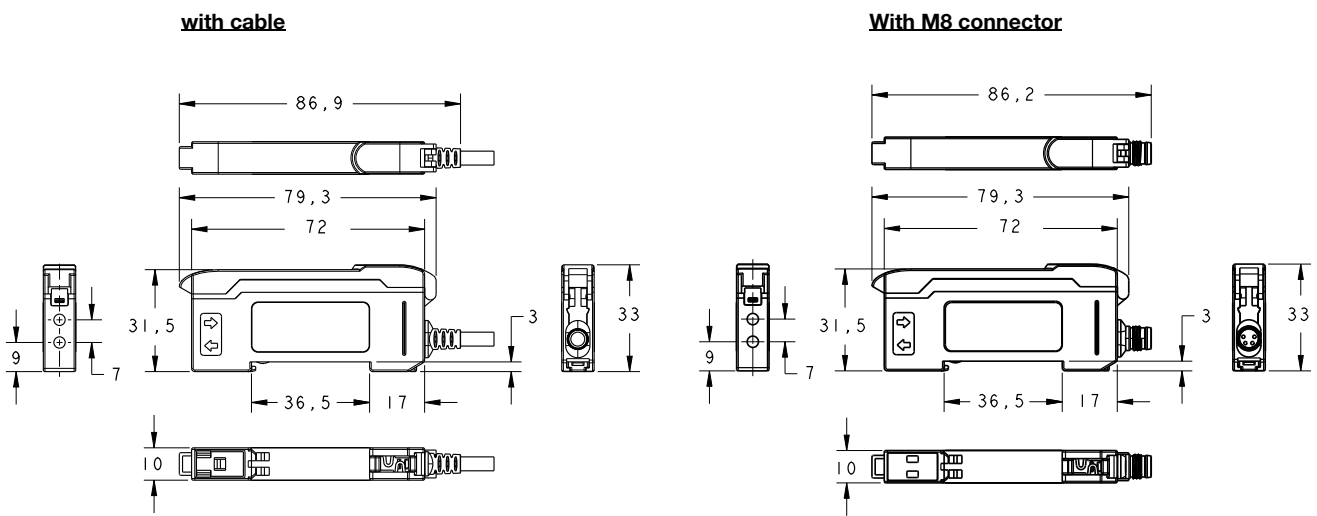
Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

OVERVIEW OF FIBER OPTIC AMPLIFIERS






Dimensioned drawing




- A** Clamping lever for fiber optic cable (unlock in direction of arrow)
- B** Connection for fiber optics receiver
- C** Connection for fiber optics transmitter

i Further details can be found in the respective data sheet.

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KF Page 506	KFX Page 522	GF Page 542	Accessories Page 558	LV Page 560

LV463

Fiber optic amplifiers	Fiber optics	Page
 Fiber optic amplifier LV463	KF / KFX	574


Additional products:		
 Fiber optic amplifier	LVSR 325	560
 Fiber optic amplifier	LV461	564
 Fiber optic amplifier	LV462	568
 Glass fiber optics	GF	538
 Plastic fiber optics	KF	498



Common technical data		
Electrical data	Operating voltage U_B	12 ... 24VDC \pm 10%
	Residual ripple	\leq 10% of U_B
	Open-circuit current	\leq 40mA
	Signal voltage high/low	$\geq (U_B - 2.5V) / \leq 2.5V$
Indicators	Yellow LEDs	Switching output active
	Display	2 x 7-segment, 4-digit, Red: signal strength, Green: switching threshold
Operational controls	Rocker push button	Menu-driven sensor setting
Mechanical data	Housing	Plastic (ABS/PC)
	Fiber optic connection	Clamp
	Weight (connector/cable)	50g/70g
Environmental data	Ambient temperature (operation)	-10°C ... +55°C
	Protection class	IP 50, NEMA 1
	Standards applied	IEC 60947-5-2

Features

- For plastic fiber optics
- Two large, easy-to-read displays for the simultaneous display of the signal value and the switching threshold
- Simple operation and easy-to-understand menu functions for optimum configuration
- Internal multiplex operation of up to six units
- Line teach or external transmitter activation
- Three different teach modes for fast sensor adjustment
- Switch for changing between light and dark switching



Fiber optic ABC	
● Plastic fiber optics	Page 706
● Fiber optic installation	Page 707

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Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

FIBER OPTIC AMPLIFIERS

Part description Part No.:	Fiber optics	Light source	Output	Switching
Fiber optic amplifiers for plastic fiber optics				
LV463.7 / 4T - M8 50118405	Plastic KF/KFX, Ø 2.2mm	Red light	1 xPNP/DC	Light/dark reversible
LV463.7 / 4T 50118404	Plastic KF/KFX, Ø 2.2mm	Red light	1 xPNP/DC	Light/dark reversible
LV463.7 / 4T - 150 - M8.3 50119070	Plastic KF/KFX, Ø 2.2mm	Red light	1 xPNP/DC	Light/dark reversible
LV463.7 / 4T - 150 - M8 50118406	Plastic KF/KFX, Ø 2.2mm	Red light	1 xPNP/DC	Light/dark reversible
LV463.7 / 4T - 150 - M12 50118407	Plastic KF/KFX, Ø 2.2mm	Red light	1 xPNP/DC	Light/dark reversible
LV463.7 / 2T - M8 50118409	Plastic KF/KFX, Ø 2.2mm	Red light	1 xNPN/DC	Light/dark reversible
LV463.7 / 2T 50118408	Plastic KF/KFX, Ø 2.2mm	Red light	1 xNPN/DC	Light/dark reversible
LV463.7 / 2T - 150 - M8.3 50119071	Plastic KF/KFX, Ø 2.2mm	Red light	1 xNPN/DC	Light/dark reversible
LV463.7 / 2T - 150 - M8 50118410	Plastic KF/KFX, Ø 2.2mm	Red light	1 xNPN/DC	Light/dark reversible
LV463.7 / 2T - 150 - M12 50118411	Plastic KF/KFX, Ø 2.2mm	Red light	1 xNPN/DC	Light/dark reversible

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104523	K - D M8W - 3P - 5m - PVC	Connection cable 5000mm, M8 angular, 3-pin, PVC
b 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M8 axial, 3-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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LV463

Fiber optic amplifiers

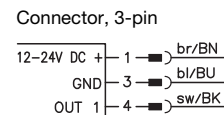
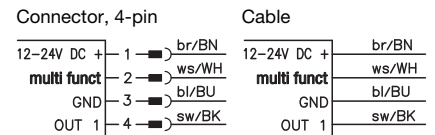
Connection	Option	Accessories
M8 connector, 4-pin	1, 2, 3, 4, 5, 6, 7	c, d
Cable, 2m	1, 2, 3, 4, 5, 6, 7	
Cable, 150mm with M8 connector 3-pin	1, 2, 3, 5, 7	a, b
Cable, 150mm with M8 connector 4-pin	1, 2, 3, 4, 5, 6, 7	c, d
Cable, 150mm with M12 connector 4-pin	1, 2, 3, 4, 5, 6, 7	e, f
M8 connector, 4-pin	1, 2, 3, 4, 5, 6, 7	c, d
Cable, 2m	1, 2, 3, 4, 5, 6, 7	
Cable, 150mm with M8 connector 3-pin	1, 2, 3, 5, 7	a, b
Cable, 150mm with M8 connector 4-pin	1, 2, 3, 4, 5, 6, 7	c, d
Cable, 150mm with M12 connector 4-pin	1, 2, 3, 4, 5, 6, 7	e, f



Fiber optic ABC

- Plastic fiber optics Page 706
- Fiber optic installation Page 707

Electrical connection



Options

- 2 displays for indicating the signal strength and switching threshold
- Selector switch for normal operation / sensor setting / teach-in operating modes
- Menu-driven sensor setting by means of display and rocker push button
- Multifunction input for teach-in / activation / multiplex operation
- Selectable teach mode: 1 point / 2 point / dynamic
- Multiplex operation of up to six LV463 amplifiers
- Time functions configurable (switch-on/off delay, pulse contact)

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Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

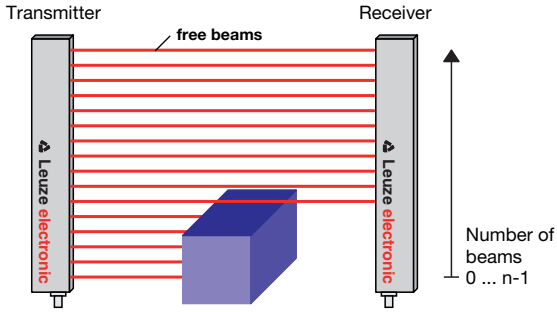
Light
Curtains

Protective
Sensors

SELECTION GUIDE

VARIO B switching light curtains




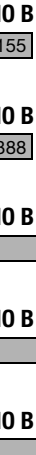
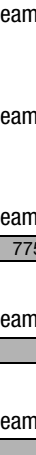
Measurement principle



The infrared light signal emitted by the transmitter diode is detected at the receiver. If one or more beams are interrupted by an object, this is signaled at the switching output. Triggering of the integrated system and soiling control is signaled via the warning output.

Products and measurement field lengths [mm]

Op. range: 0.7 ... 5m
Cycle time: 1 ms / beam

	VARIO B beam spacing 5mm 35 155	from page 578 onwards
	VARIO B beam spacing 12.5mm 88 388	from page 578 onwards
	VARIO B beam spacing 25mm 175 775	from page 578 onwards
	VARIO B beam spacing 50mm 350 1550	from page 578 onwards
	VARIO B beam spacing 100mm 700 3100	from page 578 onwards

Features

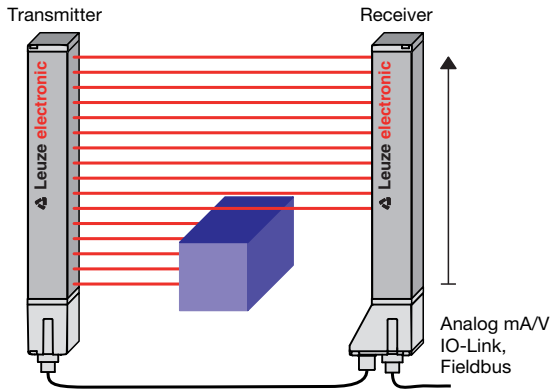
- Plug & Play use through factory-set configuration and simple installation
- Can be specially configured to detect optically critical objects
- Integrated control device with signal and warning output
- Measurement field coverage up to 3.2m with an operating range of up to 5m

LIGHT CURTAINS

Photoel. sensors/
light scanners,
cubic housing

CML 720 measuring light curtains

Measurement principle



Thanks to the short response time of 30µs per beam, this measuring light curtain is predestined for the detection of extremely fast processes. Due to the integrated evaluation unit, the CML can be quickly and directly integrated into the control environment. With the display in the connection head, a PC is not necessary for commissioning.

Products and measurement field lengths [mm]

Range: 0.3 ... 6m (0.1 ... 3m)
Cycle time: Σ system light beams x 0.03ms + 0.4ms (at least 1ms)



CML 720 beam spacing 5mm from page 584

160 2960

CML 720 beam spacing 10mm from page 584

160 2880

CML 720 beam spacing 20mm from page 584

150 2870

CML 720 beam spacing 40mm from page 584

290 2850

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

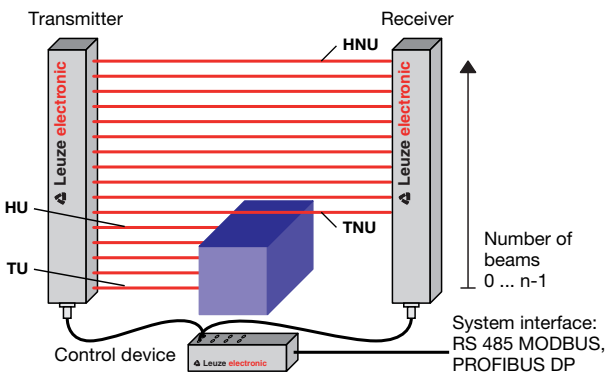
Features

- Up to 6m of range for higher performance reserves
- Fieldbus or IO-Link connections for direct configuration via the control
- Analog current and voltage interfaces
- Large, legible display with sturdy membrane keyboard in the receiver

Inductive
Switches

KONTURflex measuring light curtains

Measurement principle



The state of the infrared light field between the transmitter and receiver light strips is analyzed in the external control device for configurable functions. The corresponding information is passed on to the primary control via the system interface.

Products and measurement field lengths [mm]

Op. range: 0 ... 4m
Cycle time: $(\Sigma$ number of light beams in system + 3) x 50µs



KONTURflex beam spacing 5mm from page 592 onwards

80 2560

KONTURflex beam spacing 10mm from page 592 onwards

160 3200

KONTURflex beam spacing 20mm from page 592 onwards

160 3200



QUATTRO control device from page 592 onwards

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Features

- Up to 4 light curtains with varying number of beams with a total of up to 512 beams per control device
- Configuration of the control device either directly or off-line via PC configuration software with subsequent download
- Fast measurement value acquisition dependent on the number of system beams connected to the control device
- Integrated and configurable measurement functions (e.g. hole recognition, web center recognition, blanking)

Protective
Sensors

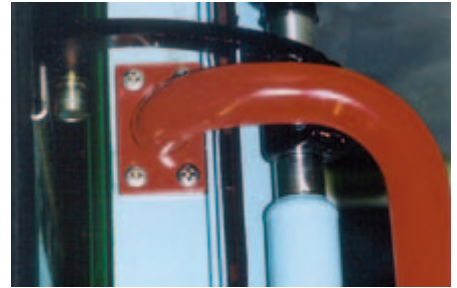
OVERVIEW OF SWITCHING LIGHT CURTAINS



Projection control in materials handling



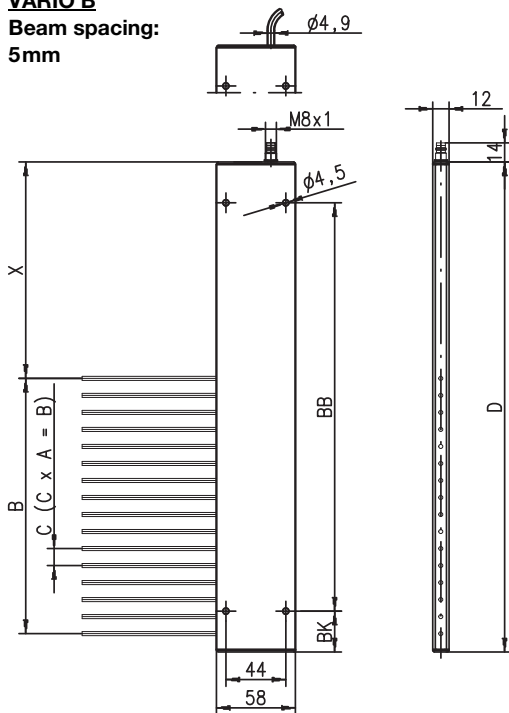
Process control in foil packaging



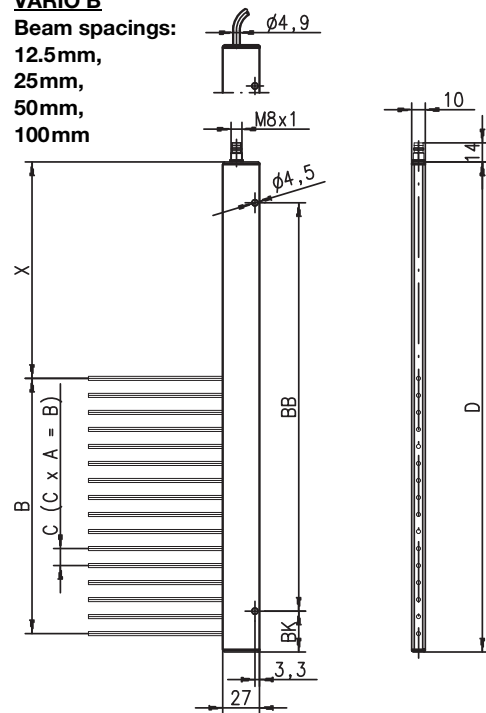
Access control in public transportation

Dimensioned drawing

VARIO B
Beam spacing:
5mm



VARIO B
Beam spacings:
12.5mm,
25mm,
50mm,
100mm



- A** Beam spacing
- B** Measurement field length
- C** No. of beams
- D** Profile length
- BB** Distance from bore hole to bore hole
- BK** Distance from bore hole to housing edge
- X** Distance from first beam to housing edge



Dimensions of optional measurement field lengths on request. Further details can be found in the respective data sheet.


We reserve the right to make changes • VARIO_B_Overview_EN.fm

VARIO B
Page 578



CML 720
Page 584

KONTURflex
Page 592

VARIO B

Light curtain	Beam spacing	Page
 VARIO B switching light curtain	5 ... 100mm	580

Additional products:

 Measuring light curtain	KONTURflex	592
 Measuring light curtain	CML 720	584



Common technical data

Electrical data	Operating voltage U_B	24VDC
	Residual ripple	$\leq 15\%$ of U_B
	Output	2 x PNP or 2 x NPN, max. 200mA per output
	Cycle time (parallel mode)	1 ms / beam (min. 30ms)
Optical data	Max. no. of beams	64
	Operating range	0.7 ... 5m
	Wavelength	880nm (infrared light)
	Max. misalignment angle	$\pm 10^\circ$ between transmitter and receiver
Mechanical data	Housing	Aluminum, anodized
	Dimensions (W x H)	12 x 58mm and 10 x 27mm, resp.
	Connection	M8 connector or cable
Environmental data	Ambient temperature	-10°C ... +45°C (operation)
	Protection class	IP 54

Mounting systems for this series can be found from page 647 onwards

Features

- Beam spacing 5 / 12.5 / 25 / 50 / 100mm
- Operating range 5m
- Calibratability for optically critical objects
- Factory-set configuration
- Configuration software



Optical Sensor

- Light curtain Page 689

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SWITCHING LIGHT CURTAINS

Part description Part No.:	▶ = Transmitter ◀ = Receiver	A [mm]	B [mm]	C	D [mm]	BB [mm]	BK [mm]	X [mm]	Op. range [m]	Light source
▶VBT-5-35-S8 ◀IVBR/4-5-35-00-S8	50107869 50107869-00	5	35	8	120	108	6	67.5	0.7 ... 5	Infrared light 880nm
▶VBT-5-35-S8 ◀IVBR/2-5-35-00-S8	50107869 50107869-10	5	35	8	120	108	6	67.5	0.7 ... 5	Infrared light 880nm
▶VBT-12.5-88-S8 ◀IVBR/4-12.5-88-00-S8	50107888 50107888-00	12.5	88	8	260	200	30	158.5	0.7 ... 5	Infrared light 880nm
▶VBT-12.5-88-S8 ◀IVBR/2-12.5-88-00-S8	50107888 50107888-10	12.5	88	8	260	200	30	158.5	0.7 ... 5	Infrared light 880nm
▶VBT-25-175-S8 ◀IVBR/4-25-175-00-S8	50107911 50107911-00	25	175	8	360	300	30	165	0.7 ... 5	Infrared light 880nm
▶VBT-25-2175.4000 ◀IVBR/4-25-2175-00.4000	50107936 50107936-00	25	175	8	360	300	30	165	0.7 ... 5	Infrared light 880nm
▶VBT-25-175-S8 ◀IVBR/2-25-175-00-S8	50107911 50107911-10	25	175	8	360	300	30	165	0.7 ... 5	Infrared light 880nm
▶VBT-50-350-S8 ◀IVBR/4-50-350-00-S8	50107939 50107939-00	50	350	8	560	400	80	190	0.7 ... 5	Infrared light 880nm
▶VBT-50-350-S8 ◀IVBR/2-50-350-00-S8	50107939 50107939-10	50	350	8	560	400	80	190	0.7 ... 5	Infrared light 880nm
▶VBT-100-700-S8 ◀IVBR/4-100-700-00-S8	50107970 50107970-00	100	700	8	970	400	85	190	0.7 ... 5	Infrared light 880nm
▶VBT-100-700-S8 ◀IVBR/2-100-700-00-S8	50107970 50107970-10	100	700	8	970	400	85	190	0.7 ... 5	Infrared light 880nm

A Beam spacing **C** Number of beams **BB** Distance from bore hole to bore hole **X** Distance from first beam to housing edge
B Meas. field length **D** Profile length **BK** Distance from bore hole to housing edge

Accessories / connection cables


More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50107711	VB - Int - 232	Interface module for PC configuration via RS 232
b 50107925	UPG 50	Calibration adapter for VARIO B with M8 connector
c 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
d 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
e 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC

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VARIO B
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CML 720
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VARIO B
Light curtain



Photoel. sensors/
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Photoel. sensors/
light scanners,
cylindrical housing

Measuring
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Sensors

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Sensors

Special
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Light
Curtains

Protective
Sensors

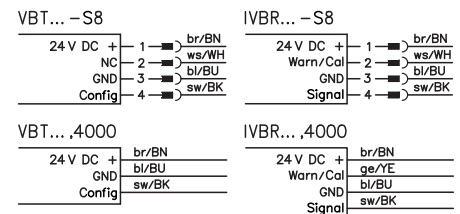
	Output ¹⁾ / Switching	Connection ²⁾	Option	Accessories
	PNP / light	M8 connector	1, 2, 3	a, b, c, d, e
	NPN / light	M8 connector	1, 2, 3	a, b, c, d, e
	PNP / light	M8 connector	1, 2, 3	a, b, c, d, e
	NPN / light	M8 connector	1, 2, 3	a, b, c, d, e
	PNP / light	M8 connector	1, 2, 3	a, b, c, d, e
	PNP / light	Cable, 4m	1, 2, 3	a
	NPN / light	M8 connector	1, 2, 3	a, b, c, d, e
	PNP / light	M8 connector	1, 2, 3	a, b, c, d, e
	NPN / light	M8 connector	1, 2, 3	a, b, c, d, e
	PNP / light	M8 connector	1, 2, 3	a, b, c, d, e
	NPN / light	M8 connector	1, 2, 3	a, b, c, d, e



Optical Sensor

- Light curtain Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection



1) The factory-set configuration can be changed at a later time using the VARIOsoft conf. software
 2) Also available with line connection, line length 4 m



Additional light curtains available with **measurement field lengths of up to 3150mm** and **up to 64 beams**, see **table on page 582**. **VARIOsoft configuration software** available at no cost at www.leuze.com.

Options

- 1 Combined warning output / calibration input (configurable)
- 2 Parallel beam mode / parallel and diagonal beam mode configurable
- 3 Light/dark switching configurable

SWITCHING LIGHT CURTAINS

VARIO B transmitter

V B T - 1 2 . 5 - 6 8 8 - S 8

Model	
VBT	VARIO B transmitter
Beam spacing A	
5	5 mm
12.5	12.5 mm
25	25 mm
50	50 mm
100	100 mm
Measurement field length B	
XXXX	In mm, see adjacent table 'Measurement field length'
Electrical connection	
S8	M8 connector, 4-pin, axial

VARIO B receiver


I V B R / 2 - 1 2 . 5 - 6 8 8 - 0 0 - S 8

Model	
IVBR	VARIO B receiver with warning output
Output	
2	NPN
4	PNP
Beam spacing A	
5	5 mm
12.5	12.5 mm
25	25 mm
50	50 mm
100	100 mm
Measurement field length B	
XXXX	In mm, see adjacent table 'Measurement field length'
Measurement function	
00	Parallel beam method, light switching
01	Parallel and diagonal beam method, light switching
02	Parallel beam method, dark switching
03	Parallel and diagonal beam method, dark switching
Electrical connection	
S8	M8 connector, 4-pin, axial

We reserve the right to make changes • VARIO_B_2_EN.fm



VARIO B
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CML 720
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KONTURflex
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VARIO B
Light curtain



Photoel. sensors/
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light scanners,
cylindric housing

Measuring
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Light
Curtains

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Sensors

Beam spacing A [mm]	Measurement field length B [mm]										
	35	75	115	155	195	235	275	315			
5	35	75	115	155	195	235	275	315			
12.5	88	188	288	388	488	588	688	788			
25	175	375	575	775	975	1175	1375	1575	1775 ¹⁾	2175 ¹⁾	2375 ¹⁾
50	350	750	1150	1550	1950	2350	2750	3150			
100	700	1100	1500	1900	2300	2700	3100				

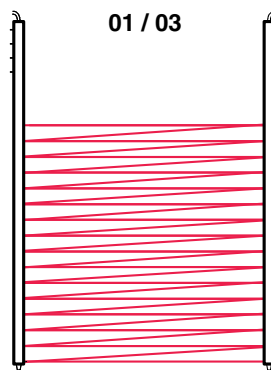
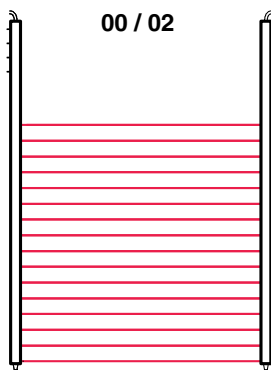


1) Only available with PNP switching output and with measurement function 00!



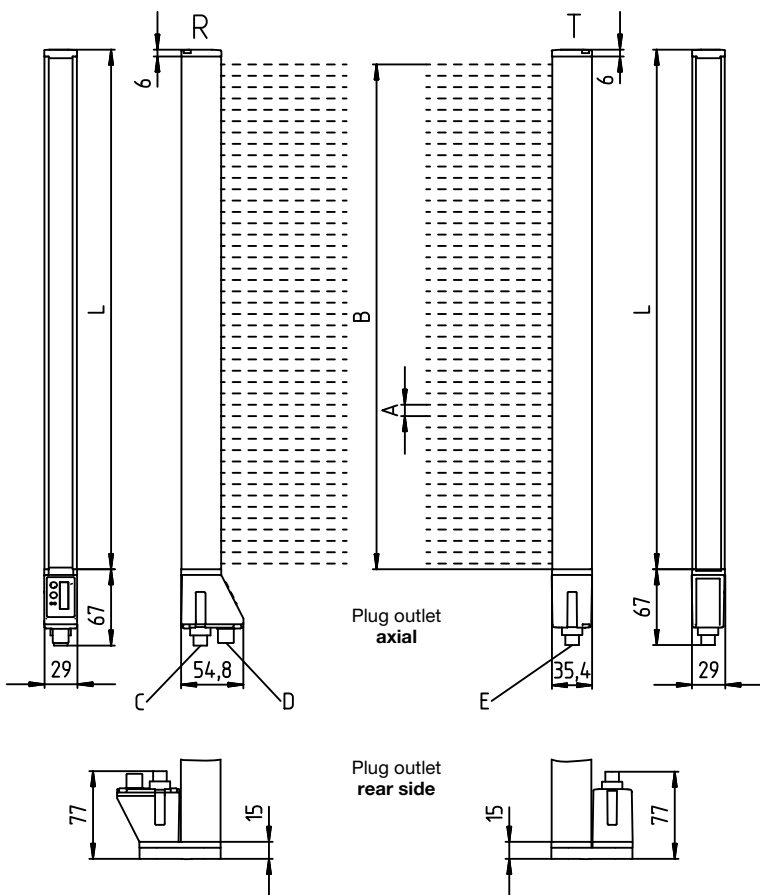
Beam spacing A and **measurement field length B** of a transmitter/
receiver pair **must be the same!**

Measurement function	Light switching	Dark switching
	Parallel beam method	00
Parallel and diagonal beam method	01	03



OVERVIEW OF MEASURING LIGHT CURTAINS

Dimensioned drawing



Further details can be found in the respective data sheet.

- A** Beam spacing (see table on page)
- B** Measurement field length
- L** Profile length
- R** Receiver
- T** Transmitter

IO-Link / analog devices


- C** Power In/Out
- D** Connection to transmitter
- E** Connection to receiver

CANopen devices

- C** Power In/Out + transmitter connection (Y-cable)
- D** Fieldbus connection (Y-cable)
- E** Connection to receiver


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KONTURflex
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CML 720

Light curtain	Beam spacing	Page
 CML 720 measuring light curtain	5 ... 40mm	586

Additional products:

 Switching light curtain	VARIO B	578
 Measuring light curtain	KONTURflex	592



Common technical data

Electrical data	Operating voltage U_B	18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Output	2 / 4 pins can be configured as input or output
	Response time	30 μ s / beam
	Cycle time	Beam spacing x 0.03ms + 0.4ms (at least 1 ms)
Optical data	Max. no. of beams	592
	Operating range	0.1 ... 3m (A = 5mm) 0.3 ... 6m (A \geq 10mm)
	Wavelength	940nm (infrared light)
Mechanical data	Housing	Aluminum continuous-cast
	Optics cover	Plastic
	Connection	M12 connector
Environmental data	Ambient temperature	-20°C ... +60°C (operation)
	Protection class	IP 65
	Standards applied	IEC 60947-5-2

Accessories for this series can be found on p. 590 and from p. 646 onwards

Features

- Beam spacing 5 / 10 / 20 / 40mm
- Integrated system controller
- Minimum dead zone for gapless cascading
- Display for fast alignment, configuration and diagnosis
- Configurable switching outputs
- IO-Link, analog or CANopen interface



Optical Sensor

- Light curtain Page 689

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

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Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

MEASURING LIGHT CURTAINS

Part description Part No.:	▶ = Transmitter ◀ = Receiver	Beam spacing A [mm]	Meas. field length B [mm]	Profile length L [mm]	Op. range [m]	Interface
CML 720 measuring light curtains						
▶ CML720-T05-800.A-M12	50119377	5	800	808	0.1 ... 3	Analog/mA Analog/V
◀ CML720-R05-800.A/CV-M12	50119805					
▶ CML720-T05-800.A-M12	50119377	5	800	808	0.1 ... 3	CANopen
◀ CML720-R05-800.A/CN-M12	50119615					
▶ CML720-T05-800.A-M12	50119377	5	800	808	0.1 ... 3	IO-Link
◀ CML720-R05-800.A/L-M12	50119724					
▶ CML720-T10-800.A-M12	50119409	10	800	808	0.3 ... 6	Analog/mA Analog/V
◀ CML720-R10-800.A/CV-M12	50119837					
▶ CML720-T10-800.A-M12	50119409	10	800	808	0.3 ... 6	CANopen
◀ CML720-R10-800.A/CN-M12	50119647					
▶ CML720-T10-800.A-M12	50119409	10	800	808	0.3 ... 6	IO-Link
◀ CML720-R10-800.A/L-M12	50119756					
▶ CML720-T20-790.A-M12	50119427	20	790	808	0.3 ... 6	Analog/mA Analog/V
◀ CML720-R20-790.A/CV-M12	50119855					
▶ CML720-T20-790.A-M12	50119427	20	790	808	0.3 ... 6	CANopen
◀ CML720-R20-790.A/CN-M12	50119665					
▶ CML720-T20-790.A-M12	50119427	20	790	808	0.3 ... 6	IO-Link
◀ CML720-R20-790.A/L-M12	50119774					
▶ CML720-T40-930.A-M12	50119443	40	930	968	0.3 ... 6	Analog/mA Analog/V
◀ CML720-R40-930.A/CV-M12	50119871					
▶ CML720-T40-930.A-M12	50119443	40	930	968	0.3 ... 6	CANopen
◀ CML720-R40-930.A/CN-M12	50119681					
▶ CML720-T40-930.A-M12	50119443	40	930	968	0.3 ... 6	IO-Link
◀ CML720-R40-930.A/L-M12	50119790					



For other measurement field lengths, see part number code / table on page 591!

Accessories / connection cables

Comprehensive accessories for this series can be found on page 590!



VARIO B
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CML 720
Page 584



KONTURflex
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CML 720
Light curtain



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

No. of beams	Cycle time ¹⁾ [ms]	Connection	Plug outlet	Option
160	5.2	M12 connector	axial	1, 2
160	5.2	M12 connector	axial	1, 2
160	5.2	M12 connector	axial	1, 2
80	2.8	M12 connector	axial	1, 2
80	2.8	M12 connector	axial	1, 2
80	2.8	M12 connector	axial	1, 2
40	1.6	M12 connector	axial	1, 2
40	1.6	M12 connector	axial	1, 2
40	1.6	M12 connector	axial	1, 2
24	1.12	M12 connector	axial	1, 2
24	1.12	M12 connector	axial	1, 2
24	1.12	M12 connector	axial	1, 2

1) Cycle time = beam number x 0.03ms + 0.4ms; the minimum cycle time is 1 ms.

Options

- 1 Display/control panel for quick alignment, configuration and diagnosis
- 2 Configuration of 2 (4) pins as input or output

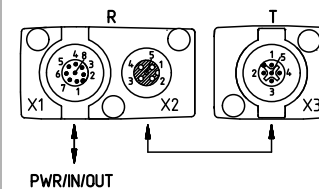


Optical Sensor

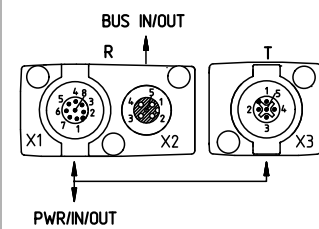
- Light curtain Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection

IO-Link / analog



CANopen



MEASURING LIGHT CURTAINS

Part description Part No.:	▶ = Transmitter ◀ = Receiver	Beam spacing A [mm]	Meas. field length B [mm]	Profile length L [mm]	Op. range [m]	Interface
CML 720 measuring light curtains						
▶ CML720-T05-800.R-M12 50119458	◀ CML720-R05-800.R/CV-M12 50120131	5	800	808	0.1 ... 3	Analog/mA Analog/V
▶ CML720-T05-800.R-M12 50119458	◀ CML720-R05-800.R/CN-M12 50119913	5	800	808	0.1 ... 3	CANopen
▶ CML720-T05-800.R-M12 50119458	◀ CML720-R05-800.R/L-M12 50119994	5	800	808	0.1 ... 3	IO-Link
▶ CML720-T10-800.R-M12 50119491	◀ CML720-R10-800.R/CV-M12 50120164	10	800	808	0.3 ... 6	Analog/mA Analog/V
▶ CML720-T10-800.R-M12 50119491	◀ CML720-R10-800.R/CN-M12 50119945	10	800	808	0.3 ... 6	CANopen
▶ CML720-T10-800.R-M12 50119491	◀ CML720-R10-800.R/L-M12 50120080	10	800	808	0.3 ... 6	IO-Link
▶ CML720-T20-790.R-M12 50119509	◀ CML720-R20-790.R/CV-M12 50120182	20	790	808	0.3 ... 6	Analog/mA Analog/V
▶ CML720-T20-790.R-M12 50119509	◀ CML720-R20-790.R/CN-M12 50119963	20	790	808	0.3 ... 6	CANopen
▶ CML720-T20-790.R-M12 50119509	◀ CML720-R20-790.R/L-M12 50120098	20	790	808	0.3 ... 6	IO-Link
▶ CML720-T40-930.R-M12 50119525	◀ CML720-R40-930.R/CV-M12 50120198	40	930	968	0.3 ... 6	Analog/mA Analog/V
▶ CML720-T40-930.R-M12 50119525	◀ CML720-R40-930.R/CN-M12 50119979	40	930	968	0.3 ... 6	CANopen
▶ CML720-T40-930.R-M12 50119525	◀ CML720-R40-930.R/L-M12 50120115	40	930	968	0.3 ... 6	IO-Link



For other measurement field lengths, see part number code / table on page 591!

Accessories / connection cables

Comprehensive accessories for this series can be found on page 590!



VARIO B
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CML 720
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KONTURflex
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CML 720

Light curtain



Photoel. sensors/
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light scanners,
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Measuring
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Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

No. of beams	Cycle time ¹⁾ [ms]	Connection	Plug outlet	Option
160	5.2	M12 connector	rear side	1, 2
160	5.2	M12 connector	rear side	1, 2
160	5.2	M12 connector	rear side	1, 2
80	2.8	M12 connector	rear side	1, 2
80	2.8	M12 connector	rear side	1, 2
80	2.8	M12 connector	rear side	1, 2
40	1.6	M12 connector	rear side	1, 2
40	1.6	M12 connector	rear side	1, 2
40	1.6	M12 connector	rear side	1, 2
24	1.12	M12 connector	rear side	1, 2
24	1.12	M12 connector	rear side	1, 2
24	1.12	M12 connector	rear side	1, 2

1) Cycle time = beam number x 0.03ms + 0.4ms; the minimum cycle time is 1 ms.

Options

- 1 Display/control panel for quick alignment, configuration and diagnosis
- 2 Configuration of 2 (4) pins as input or output

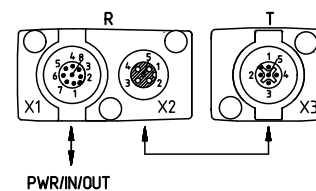


Optical Sensor

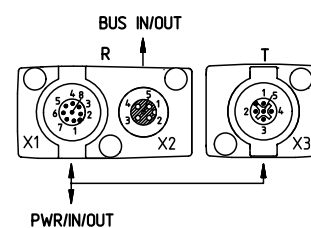
- Light curtain Page 689
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Electrical connection

IO-Link / analog



CANopen



MEASURING LIGHT CURTAINS

Accessories / connection cables		More accessories can be found from page 646 onwards	
Part no.	Designation	Features	
Mounting brackets			
425725	BT-4NC	4 sliding blocks	
429046	BT-2R1	Bracket set 360° (consisting of 2 x BT 360°)	
429056	BT-2L	L-angle bracket set (consisting of 2 x BT-L)	
429057	BT-2Z	Z-angle bracket set (consisting of 2 x BT-Z)	
424417	BT-2P40	Mounting clamp set for mounting in device columns (consisting of 2 x BT-P40)	
429058	BT-2SSD	2 brackets, L=70mm, swiveling, vibration damper, incl. 4 screws/4 sliding blocks	
429049	BT-2SSD-270	2 brackets, L=270mm, swiveling, vibration damper, incl. 4 screws/4 sliding blocks	
Connection cable for IO-Link and analog devices			
50104591	K-D M12A-8P-2m-PUR	Connection cable 2000 mm, M12 axial - open cable end, 8-pin, PUR	
50104590	K-D M12A-8P-5m-PUR	Connection cable 5000 mm, M12 axial - open cable end, 8-pin, PUR	
50106882	K-D M12A-5P-10m-PUR	Connection cable 10000 mm, M12 axial - open cable end, 8-pin, PUR	
50114691	KB DN/CAN-1000 SBA	Connection cable between transmitter and receiver 1000 mm, PUR	
50114694	KB DN/CAN-2000 SBA	Connection cable between transmitter and receiver 2000 mm, PUR	
50114698	KB DN/CAN-5000 SBA	Connection cable between transmitter and receiver 5000 mm, PUR	
Connection cable for fieldbus devices			
50104555	K-D M12A-5P-2m-PVC	Connection cable 2000 mm, M12 axial - open cable end, 5-pin, PVC	
50104557	K-D M12A-5P-5m-PVC	Connection cable 5000 mm, M12 axial - open cable end, 5-pin, PVC	
50104559	K-D M12A-5P-10m-PVC	Connection cable 10000 mm, M12 axial - open cable end, 5-pin, PVC	
50104567	K-D M12A-5P-2m-PUR	Connection cable 2000 mm, M12 axial - open cable end, 5-pin, PUR	
50104569	K-D M12A-5P-5m-PUR	Connection cable 5000 mm, M12 axial - open cable end, 5-pin, PUR	
50118182	K-Y1 M12A-2m-M12A-S-PUR	Y-connection cable between transmitter and receiver 150 mm/2000 mm, PUR	
50118183	K-Y1 M12A-5m-M12A-S-PUR	Y-connection cable between transmitter and receiver 150 mm/5000 mm, PUR	
50118185	K-YCN M12A-M12A-S-PUR	Short Y-CANopen fieldbus connection cable 250 mm/350 mm, PUR	
50118184	K-YCN M12A-5m-M12A-S-PUR	Y-CANopen fieldbus connection cable 250 mm/5000 mm, PUR	
IO-Link accessories			
50112085	SET MD12-US2-IOL1 + Zub	Programming set for IO-Link, analog, fieldbus devices (IO-Link master V1.01+cable+power supply)	
50120999	K-DS M12A-8P-4P-2m-L-PUR	Connection cable CML (IO-Link/analog) to IO-Link master, 2000 mm, 8-pin socket/5-pin plug	
50121000	K-DS M12A-8P-4P-5m-L-PUR	Connection cable CML (IO-Link/analog) to IO-Link master, 5000 mm, 8-pin socket/5-pin plug	
50110126	K-DS M12A-M12A-4P-2m-PVC	Connection cable CML (fieldbus) to IO-Link master, 2000 mm, 4-pin socket/4-pin plug	

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KONTURflex
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CML 720

Light curtain



Photoel. sensors/
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Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

CML 720

C M L 7 2 0 - T 0 5 - 1 9 2 0 . A - M 1 2

C M L 7 2 0 - R 0 5 - 1 9 2 0 . A / C N - M 1 2

Operating principle

CML Measuring light curtain

Series

720 720 Series

Function

T Transmitter
R Receiver

Beam spacing

05 5 mm
10 10 mm
20 20 mm
40 40 mm

Measurement field length

xxxx Measurement field length [mm]
For values, see following table

Equipment

A Plug outlet axial
R Plug outlet rear side

Interface

L IO-Link
CN CANopen
PB PROFIBUS
CV Analog, current and voltage

Electrical connection

M12 M12 connector



Beam spacing A and measurement field length B of a transmitter/receiver pair must be the same!

		Profile length L [mm]																																			
		168	248	328	408	488	568	648	728	808	888	968	1048	1128	1208	1288	1368	1448	1528	1608	1688	1768	1848	1928	2008	2088	2168	2248	2328	2408	2488	2568	2648	2728	2808	2888	2968
Measurement field length B [mm] at beam spacing A [mm]	5	160	240	320	400	480	560	640	720	800	880	960	1040	1120	1200	1280	1360	1440	1520	1600	1680	1760	1840	1920	2000	2080	2160	2240	2320	2400	2480	2560	2640	2720	2800	2880	2960
	10	160	-	320	-	480	-	640	-	800	-	960	-	1120	-	1280	-	1440	-	1600	-	1760	-	1920	-	2080	-	2240	-	2400	-	2560	-	2720	-	2880	-
	20	150	-	310	-	470	-	630	-	790	-	950	-	1110	-	1270	-	1430	-	1590	-	1750	-	1910	-	2070	-	2230	-	2390	-	2550	-	2710	-	2870	-
	40	-	-	290	-	-	-	610	-	-	-	930	-	-	-	1250	-	-	-	1570	-	-	-	1890	-	-	-	2210	-	-	-	2530	-	-	-	2850	-

OVERVIEW OF MEASURING LIGHT CURTAINS



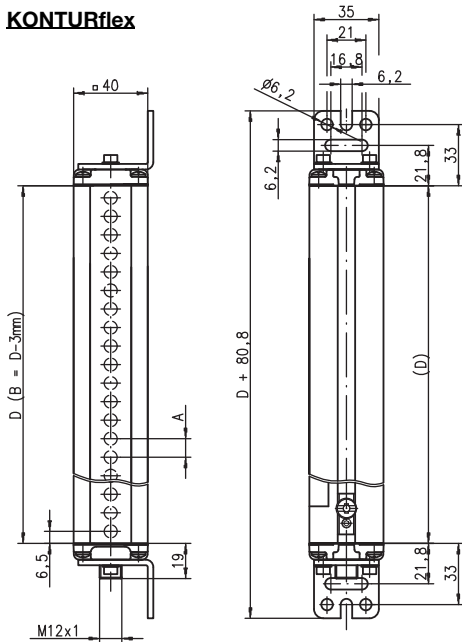
Powder-coating system



Painting system

Dimensioned drawing

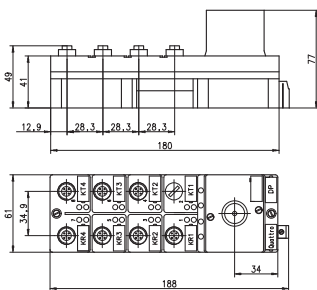
KONTURflex



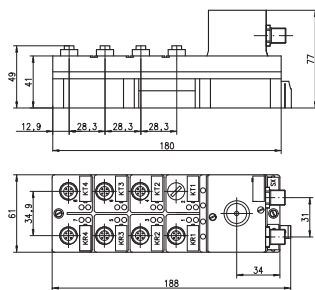
Dimensions of optional measurement field lengths on request. Further details can be found

- A** Beam spacing
- B** Measurement field length
- D** Profile length

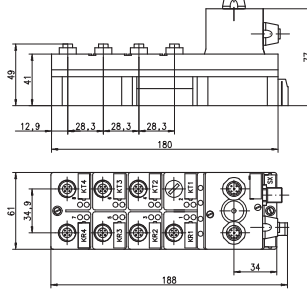
QUATTRO - RSX QUATTRO - DP QUATTRO - CANopen



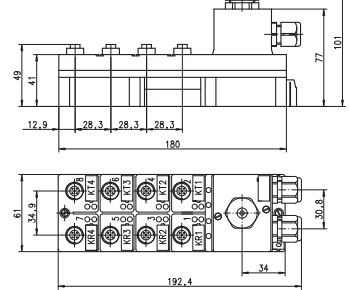
QUATTRO - RSX / M12



QUATTRO - DP / M12



QUATTRO - DP / KV




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VARIO B
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KONTURflex
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KONTURflex

Light curtain	Beam spacing	Page
 KONTURflex measuring light curtain	5 ... 20mm	594

Additional products:

 Switching light curtain	VARIO B	578
 Measuring light curtain	CML 720	584



Common technical data

Electrical data	Operating voltage U_B	12VDC (light curtain) 24VDC (control device)
	Residual ripple	$\leq 20\%$ of U_B
	Cycle time	(Number of beams in system + 3) x 50 μ s
	Output	1 x PNP, configurable
	Connection	M12 cable, 5-pin, max. 20m between control device and light curtains
	System interface	RS 485 PROFIBUS DP CANopen
	Config. interface	RS 232
Optical data	Max. no. of beams	512 on 4 systems
	Wavelength	880nm (infrared light)
Mechanical data	Housing	Light curtain: aluminum Control device: plastic
	Environmental data	Ambient temperature
Protection class		IP 65
Standards applied		IEC 60947-5-2, UL 508
Mounting systems for this series can be found from page 647 onwards		

Features

- Beam spacings 5 / 10 / 20mm
- Operating range 4m
- Up to 4 light curtains per QUATTRO control device
- Integrated and configurable functions
- Factory-set configuration
- PC configuration software



Optical Sensor

- Light curtain Page 689

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

MEASURING LIGHT CURTAINS

Part description Part No.:	▶ = Transmitter ◀ = Receiver	Beam spacing A [mm]	Meas. field length B [mm]	No. of beams	Profile length D [mm]	Op. range [m]	Light source
KONTURflex measuring light curtains							
▶ KT 5-80 ◀ KR 5-80	671008 670008	5	80	16	83	0 ... 4	Infrared light 880nm
▶ KT 10-160 ◀ KR 10-160	673016 672016	10	160	16	163	0 ... 4	Infrared light 880nm
▶ KT 20-160 ◀ KR 20-160	675016 674016	20	160	8	163	0 ... 4	Infrared light 880nm
For other measurement field lengths, see type key on page 596!							



A **QUATTRO control device is absolutely necessary** for operating the KONTURflex light curtains.
See following double page!



KONTURflexsoft configuration software available at no cost at www.leuze.com.
Accessories / connection cables: additional cable lengths available!


We reserve the right to make changes • KONTURflex_1_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 678033	CB - M12 - 2500S - 5GF/GM	QUATTRO-KT/KR connection cable, length 2.5m, shielded
b 678035	CB - M12 - 5000S - 5GF/GM	QUATTRO-KT/KR connection cable, length 5m, shielded
c 678040	CB - M12 - 10000S - 5GF/GM	QUATTRO-KT/KR connection cable, length 10m, shielded


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KONTURflex
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KONTURflex
Light curtain



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

Cycle time ¹⁾ [μs]	Output ²⁾	Connection	Option	Accessories
950	QUATTRO control device	M12 connector	1	a, b, c
950	QUATTRO control device	M12 connector	1	a, b, c
550	QUATTRO control device	M12 connector	1	a, b, c

1) Cycle time = (total number of beams + 3) x 50μs
2) The factory-set config. can be changed at a later time using the KONTURflexsoft config. software



Optical Sensor

- Light curtain Page 689
- Connection types Page 694
- Outputs Page 694

Electrical connection

See Quattro control devices!

Options

- 1 UL approval (class 2 acc. to NEC)

www.leuze.com/en/light-curtains/

MEASURING LIGHT CURTAINS

KONTURflex

K T 1 0 - 1 2 8 0 0 0

Model

KT KONTURflex transmitter

KR KONTURflex receiver

Beam spacing A

5 5mm

10 10mm

20 20mm

Measurement field length B

XXXX In mm, see adjacent table 'Measurement field length'

Optional

Ex Ex version



VARIO B
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KONTURflex
Page 592

KONTURflex
Light curtain



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindric housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

**Light
Curtains**

Protective
Sensors

Beam spacing A [mm]	Measurement field length B [mm]																									
	80	160	240	320	400	480	560	640	720	800	960	1120	1280	1440	1600	1760	1920	2080	2240	2400	2560	2720	2880	3040	3200	
5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•					
10		•		•		•		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
20	•		•		•		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



Beam spacing A and measurement field length B of a transmitter/receiver pair must be the same!



MEASURING LIGHT CURTAINS

Part description Part No.:	Description
QUATTRO control devices for KONTURflex measuring light curtains	
QUATTRO - RSX 670001	Control device for up to 4 KONTURflex light curtains, system interface: RS 232/RS 485 , connection via 5-pin built-in plug
QUATTRO - RSX / M12 670003	Control device for up to 4 KONTURflex light curtains, system interface: RS 232/RS 485 , connection via 5-/8-pin M12 connector
QUATTRO - DP 670002	Control device for up to 4 KONTURflex light curtains, system interface: RS 485/PROFIBUS DP , connection via 5-pin built-in plug
QUATTRO - DP / M12 50111868	Control device for up to 4 KONTURflex light curtains, system interface: RS 485/PROFIBUS DP , connection via 5-pin M12 connector
QUATTRO - DP / KV 670005	Control device for up to 4 KONTURflex light curtains, system interface: RS 485/PROFIBUS DP , connection via 5-pin built-in plug with screwed cable gland
QUATTRO - CANopen 670004	Control device for up to 4 KONTURflex light curtains, system interface: CANopen , connection via 5-pin built-in plug



A **QUATTRO control device is absolutely necessary** for operating the KONTURflex light curtains.
Please include with your order.



KONTURflexsoft configuration software available at no cost at www.leuze.com.
Accessories / connection cables: additional cable lengths available!

Accessories / connection cables


More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 678033	CB - M12 - 2500S - 5GF/GM	QUATTRO-KT/KR connection cable, length 2.5m, shielded
b 678035	CB - M12 - 5000S - 5GF/GM	QUATTRO-KT/KR connection cable, length 5m, shielded
c 678040	CB - M12 - 10000S - 5GF/GM	QUATTRO-KT/KR connection cable, length 10m, shielded
d 50104557	K - D M12A - 5P - 5m - PVC	QUATTRO-RSX/M12 RS 232 connection cable 5m, M12 axial
e 50104590	K - D M12A - 8P - 5m - PUR	QUATTRO-RSX/M12 RS 485/U _B connection cable 5m, M12 axial
f 50111864	QUATTRO-DP Adapter M12	DP adapter from 5-pin built-in plug to M12 connector
g 678100	K - CB - SUBP - 3000	QUATTRO-PC diagnosis cable, 3m
h s. p. 661	MA 2xxi	Modular connector unit with fieldbus gateway
i 50116791	K-DS M12A-MA-5P-3m-1S-PUR	Interface cable for connection to the MA 2xxi

We reserve the right to make changes • KONTURflex_2_EN.fm



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KONTURflex
Page 592

KONTURflex

Light curtain



Output	Connection	Option	Accessories
1 x PNP, configurable	Built-in plug	1, 2, 3, 5, 6	a, b, c, g
1 x PNP, configurable	M12 connector	1, 2, 3, 5, 6	a, b, c, d, e, g, h, i
1 x PNP, configurable	Built-in plug	1, 2, 4, 5, 6	a, b, c, f, g
1 x PNP, configurable	M12 connector	1, 2, 4, 5, 6	a, b, c, d, g
1 x PNP, configurable	Built-in plug with screwed cable gland	1, 2, 4, 5, 6	a, b, c, g
1 x PNP, configurable	Built-in plug	1, 2, 4, 6	a, b, c, g



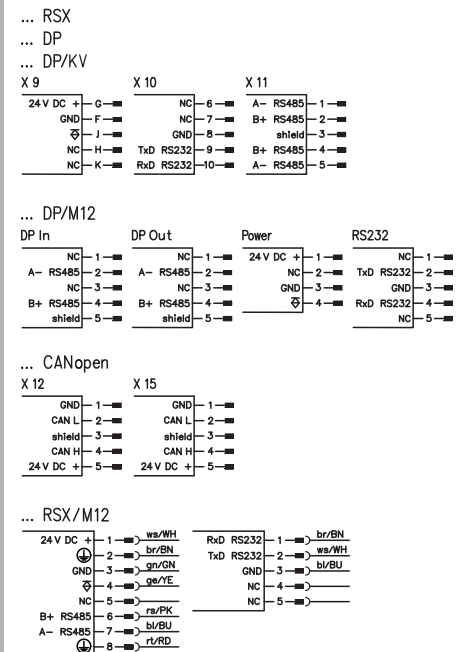
Optical Sensor

- Light curtain Page 689
- Connection types Page 694
- Outputs Page 694

Options

- 1 Configuration with KONTURflexsoft PC software
- 2 Integrated functions such as web-center monitoring, hole recognition, etc.
- 3 Data transmission and configuration via MODBUS RTU protocol
- 4 Data transmission and configuration via PROFIBUS DP or CANopen
- 5 Integrated, connectable bus terminator
- 6 UL approval (class 2 acc. to NEC)

Electrical connection



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SINGLE BEAM SAFETY DEVICES

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Operating voltage	Switching frequency	Light source	Output
Protective throughbeam sensors (AOPD type 2)			▶ = Transmitter ◀ = Receiver			
▶ SLSR 8.8 - S12 ◀ SLSR 8 / 66 - S12	500 38791 500 38792	<input type="checkbox"/> 10 <input checked="" type="checkbox"/> 14	10 ... 30VDC	200Hz	Red light	2xPush-pull/DC
▶ SLSR 25B.8 - S8 ◀ SLSR 25B / 66 - S8	50108490 50108493	<input type="checkbox"/> 20 <input checked="" type="checkbox"/> 22	10 ... 30VDC	100Hz	Red light	2xPush-pull/DC
▶ SLSR 25B.8 - S12 ◀ SLSR 25B / 66 - S12	50108489 50108492	<input type="checkbox"/> 20 <input checked="" type="checkbox"/> 22	10 ... 30VDC	100Hz	Red light	2xPush-pull/DC
▶ SLSR 25B.8 ◀ SLSR 25B / 66	50108491 50108494	<input type="checkbox"/> 20 <input checked="" type="checkbox"/> 22	10 ... 30VDC	100Hz	Red light	2xPush-pull/DC
▶ SLSR 25B.8, 200 - S12 ◀ SLSR 25B / 66, 200 - S12	50110151 50110152	<input type="checkbox"/> 20 <input checked="" type="checkbox"/> 22	10 ... 30VDC	100Hz	Red light	2xPush-pull/DC
▶ SLSR 46B.8 - S12 ◀ SLSR 46B / 66 - S12	50108538 50108540	<input type="checkbox"/> 40 <input checked="" type="checkbox"/> 44	10 ... 30VDC	100Hz	Red light	2xPush-pull/DC
▶ SLSR 46B.8 ◀ SLSR 46B / 66	50108539 50108541	<input type="checkbox"/> 40 <input checked="" type="checkbox"/> 44	10 ... 30VDC	100Hz	Red light	2xPush-pull/DC



Dimensioned drawings see standard sensors:
SLSR 8... on page 70, **SLS 25B...** on page 88, **SLS 46B...** on page 120.
 Further information and products can also be found in the **Safety at Work** Catalog from **Leuze electronic**.

We reserve the right to make changes • SLS_1_EN.fm

Accessories / connection cables More accessories can be found from page 634 onwards

Part no.	Designation	Features
a 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
b 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
c 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
d 50040739	ARH 46	Alignment aid for 46 Series sensors
e 50109545	SAT 5	Sensorscope, alignment control for all series
f 50000670	US 1	Deflection mirror
g 50017434	US 2	Deflection mirror on mounting plate, can be turned by 90°



AOPD Type 2

Protective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

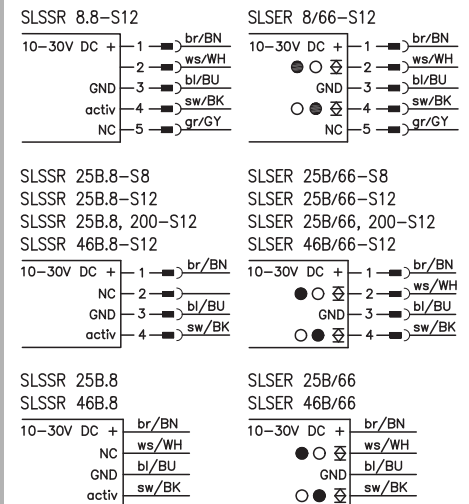
	Switching	Connection	Minimum object size	Option	Accessories
	Light/dark antivalent	M12 connector	Ø 13mm	1, 3	c, e, f, g
	Light/dark antivalent	M8 connector	Ø 14mm	1, 4	a, e, f, g
	Light/dark antivalent	M12 connector	Ø 14mm	1, 4	b, e, f, g
	Light/dark antivalent	Cable, 2m	Ø 14mm	1, 4	e, f, g
	Light/dark antivalent	Cable, 0.2m, with M12 connector	Ø 14mm	1, 4	b, e, f, g
	Light/dark antivalent	M12 connector	Ø 22mm	1, 2, 4	b, d, e, f, g
	Light/dark antivalent	Cable, 2m	Ø 22mm	1, 2, 4	d, e, f, g



Optical Sensor

- Protective sensors Page 692
- Connection types Page 694
- Outputs Page 694

Electrical connection



The protective throughbeam photoelectric sensor is a contactless active protective device only in connection with a safety-relevant control system, in which the cyclical testing of transmitter and receiver is carried out according to EN 61496-1, up to category 2, and PL d according to EN ISO 13849-1.

The safety sensor must only be used after it has been selected in accordance with the respectively applicable instructions and relevant standards, rules and regulations regarding labor protection and occupational safety, and after it has been installed on the machine, connected, commissioned, and checked by a competent person.

Options

- 1 Transmitter with activation input for testing and interlinking
- 2 Highly visible LED display assists with alignment
- 3 UL approval
- 4 UL approval (class 2 acc. to NEC)

SINGLE BEAM SAFETY DEVICES

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Operating voltage	Switching frequency	Light source	Output
Protective throughbeam sensors (AOPD type 2)			▶ = Transmitter ◀ = Receiver			
▶ SLSS 96 M - 1080 - T2 - 45 50025215	0 50	<input type="checkbox"/>	10 ... 30VDC	500Hz	Infrared light	PNP
◀ SLSE 96 M/P - 1070 - T2 - 41 50025193	0 65	<input type="checkbox"/>				
▶ SLSS 96 M - 1090 - T2 - 45 50080478	0 50	<input type="checkbox"/>	10 ... 30VDC	500Hz	Infrared light	PNP
◀ SLSE 96 M/P - 1071 - T2 - 41 50080479	0 65	<input type="checkbox"/>				
▶ SLSS 96 M - 1080 - T2 - 24 50025213	0 50	<input type="checkbox"/>	10 ... 30VDC	500Hz	Infrared light	PNP
◀ SLSE 96 M/P - 1070 - T2 - 21 50025192	0 65	<input type="checkbox"/>				
▶ SLSS 96 M - 1090 - T2 - 24 50029454	0 50	<input type="checkbox"/>	10 ... 30VDC	500Hz	Infrared light	PNP
◀ SLSE 96 M/P - 1071 - T2 - 21 50029455	0 65	<input type="checkbox"/>				
▶ SLSS 96 M - 1210 - T2 - 45 50031249	0 30	<input type="checkbox"/>	10 ... 30VDC	500Hz	Red light	PNP
◀ SLSE 96 M/P - 1200 - T2 - 41 50031250	0 39	<input type="checkbox"/>				
▶ SLSS 96 M/P - 1210 - T2 - 24 50025209	0 30	<input type="checkbox"/>	10 ... 30VDC	500Hz	Red light	PNP
◀ SLSE 96 M/P - 1200 - T2 - 21 50031562	0 39	<input type="checkbox"/>				
▶ SLSS 96 K 1080 - T2 - 45 50031559	0 50	<input type="checkbox"/>	10 ... 30VDC	500Hz	Infrared light	PNP
◀ SLSE 96 K/P 1070 - T2 - 41 50031561	0 65	<input type="checkbox"/>				
▶ SLSS 96 K 1080 - T2 - 24 50081292	0 50	<input type="checkbox"/>	10 ... 30VDC	500Hz	Infrared light	PNP
◀ SLSE 96 K/P 1070 - T2 - 21 50081293	0 65	<input type="checkbox"/>				



Dimensioned drawings see **standard sensors: SLS 96...** on **page 176**.

Additional information and products can also be found in the **Safety at work** catalog from **Leuze electronic**.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50080502	ARH 96	Alignment aid for 96 Series sensors
f 50109545	SAT 5	Sensorscope, alignment control for all series
g 50000670	US 1	Deflection mirror
h 50017434	US 2	Deflection mirror on mounting plate, can be turned by 90°

We reserve the right to make changes • SLS_2_EN.fm



SLS
Page 600

SLS
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SLS
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MSI
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AOPD Type 2

Protective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

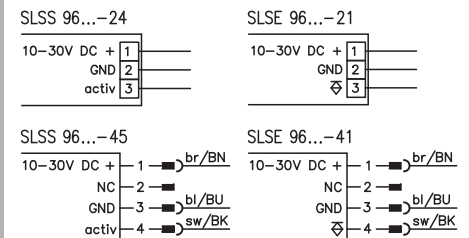
Switching	Connection	Minimum object size	Option	Accessories
Light	M12 connector	∅ 28mm	1, 3	a, b, c, d, e, f, g, h
Light	M12 connector	∅ 28mm	1, 2, 3	a, b, c, d, e, f, g, h
Light	Terminals	∅ 28mm	1, 3	e, f, g, h
Light	Terminals	∅ 28mm	1, 2, 3	e, f, g, h
Light	M12 connector	∅ 28mm	1, 3	a, b, c, d, e, f, g, h
Light	Terminals	∅ 28mm	1, 3	e, f, g, h
Light	M12 connector	∅ 28mm	1, 3	a, b, c, d, e, f, g, h
Light	Terminals	∅ 28mm	1, 3	e, f, g, h



Optical Sensor

- Protective sensors Page 692
- Connection types Page 694
- Outputs Page 694

Electrical connection



The protective throughbeam photoelectric sensor is a contactless active protective device only in connection with a safety-relevant control system, in which the cyclical testing of transmitter and receiver is carried out according to EN 61496-1, up to category 2, and PL d according to EN ISO 13849-1.

The safety sensor must only be used after it has been selected in accordance with the respectively applicable instructions and relevant standards, rules and regulations regarding labor protection and occupational safety, and after it has been installed on the machine, connected, commissioned, and checked by a competent person.

Options

- 1 Transmitter with activation input for testing and interlinking
- 2 Low-temperature version with optics heating
- 3 UL approval

SINGLE BEAM SAFETY DEVICES

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Operating voltage	Switching frequency	Light source	Output
Protective throughbeam sensors (AOPD type 2)			▶ = Transmitter ◀ = Receiver			
▶ SLSS 96 K - 1210 - T2 - 45 ◀ SLSE 96 K/P - 1200 - T2 - 41	50028011 50028012	<input type="text" value="0"/> <input type="text" value="30"/> <input type="text" value="0"/> <input type="text" value="39"/>	10 ... 30VDC	500Hz	Red light	PNP
▶ SLSS 96 K - 1210 - T2 - 45 ◀ SLSE 96 K/P - 1207 - T2 - 41	50028011 50041109	<input type="text" value="0"/> <input type="text" value="30"/> <input type="text" value="0"/> <input type="text" value="39"/>	10 ... 30VDC	500Hz	Red light	PNP
▶ SLSS 96 K - 1210 - T2 - 24 ◀ SLSE 96 K/P - 1200 - T2 - 21	50028009 50028010	<input type="text" value="0"/> <input type="text" value="30"/> <input type="text" value="0"/> <input type="text" value="39"/>	10 ... 30VDC	500Hz	Red light	PNP
▶ SLSS 96 K - 1210 - T2 - 24 ◀ SLSE 96 K/P - 1207 - T2 - 21	50028009 50035078	<input type="text" value="0"/> <input type="text" value="30"/> <input type="text" value="0"/> <input type="text" value="39"/>	10 ... 30VDC	500Hz	Red light	PNP
▶ SLSS 318 M - S12 ◀ SLSE 318 M/P - S12	50082199 50082200	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="12"/>	10 ... 30VDC	1000Hz	Red light	2x PNP
▶ SLSS 318 K - S12 ◀ SLSE 318 K/P - S12	50083116 50083117	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="12"/>	10 ... 30VDC	1000Hz	Red light	2x PNP
▶ SLSS 318 K ◀ SLSE 318 K/P	50083132 50083133	<input type="text" value="0"/> <input type="text" value="10"/> <input type="text" value="0"/> <input type="text" value="12"/>	10 ... 30VDC	1000Hz	Red light	2x PNP



Dimensioned drawings see standard sensors: SLS 96... on page 176, SLS 318... on page 220.
Additional information and products can be found in the **Safety at work** catalog from **Leuze electronic**.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50080502	ARH 96	Alignment aid for 96 Series sensors
f 50109545	SAT 5	Sensorscope, alignment control for all series
g 50000670	US 1	Deflection mirror
h 50017434	US 2	Deflection mirror on mounting plate, can be turned by 90°

We reserve the right to make changes • SLS_3_EN.fim



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SLS
Page 604

MSI
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AOPD Type 2

Protective sensors



Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

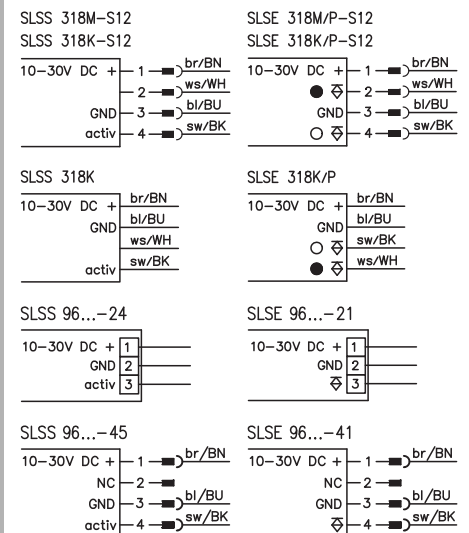
Switching	Connection	Minimum object size	Option	Accessories
Light	M12 connector	Ø 28mm	1, 3	a, b, c, d, e, f, g, h
Light	M12 connector	Ø 28mm	1, 2, 3	a, b, c, d, e, f, g, h
Light	Terminals	Ø 28mm	1, 3	e, f, g, h
Light	Terminals	Ø 28mm	1, 2, 3	e, f, g, h
Light/dark antivalent	M12 connector	Ø 13mm	1, 4	a, b, c, d, f, g, h
Light/dark antivalent	M12 connector	Ø 13mm	1, 4	a, b, c, d, f, g, h
Light/dark antivalent	Cable, 2m	Ø 13mm	1, 4	f, g, h



Optical Sensor

- Protective sensors Page 692
- Connection types Page 694
- Outputs Page 694

Electrical connection



The protective throughbeam photoelectric sensor is a contactless active protective device only in connection with a safety-relevant control system, in which the cyclical testing of transmitter and receiver is carried out according to EN 61496-1, up to category 2, and PL d according to EN ISO 13849-1.

The safety sensor must only be used after it has been selected in accordance with the respectively applicable instructions and relevant standards, rules and regulations regarding labor protection and occupational safety, and after it has been installed on the machine, connected, commissioned, and checked by a competent person.

Options

- 1 Transmitter with activation input for testing and interlinking
- 2 Filter for multi-axis operation
- 3 UL approval
- 4 UL approval (class 2 acc. to NEC)

SAFETY RELAYS/CONTROLLERS

Part description Part No.:	Feature	Function	
Safety relays (type 2)			
MSI - TR1 549988	Periodic testing of type 2 sensors	1, 2, 3, 4	
MSI - TR2 549990	Periodic testing of type 2 sensors with filter time 130 ms	1, 2, 3, 4	
MSI - TS 549989	Periodic testing of type 2 sensors with STOP1 function	1, 2, 3, 5	
Safety Controllers			
MSI 101 547802	MSI Safety Controller, pluggable screw terminals, 20 safe inputs, 4 transistor outputs	6, 7	
MSI 102 547812	MSI Safety Controller, pluggable spring-loaded terminals, 20 safe inputs, 4 transistor outputs	6, 7	
MSI 201 547803	MSI Safety Controller, pluggable screw terminals, 20 safe inputs, 4 transistor outputs, extendable with MSI-EM20x-8I4IO	6, 7, 8	
MSI 202 547813	MSI Safety Controller, pluggable spring-loaded terminals, 20 safe inputs, 4 transistor outputs, extendable with MSI-EM20x-8I4IO	6, 7, 8	
MSI - EM201 - 8I4IO 547804	Digital extension module for MSI 20x, 8 additional safe inputs and 4 freely-configurable safe channels, pluggable screw terminals	8	
MSI - EM202 - 8I4IO 547814	Digital extension module for MSI 20x, 8 additional safe inputs and 4 freely-configurable safe channels, pluggable spring-loaded terminals	8	
MSI - FB - PB101 547806	PROFIBUS module for MSI 10x / MSI 20x, pluggable screw terminals	9	

We reserve the right to make changes • SLS_4_EN.fm



Dimensioned drawings and electrical connection at www.leuze.com.

Additional information, accessories and products can be found in the **Safety at work** catalog from **Leuze electronic**.



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MSI
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MSI
Safety relays



MSI-T... functions

- 1 Start/restart interlock selectable
- 2 Contactor monitoring (EDM) selectable
- 3 "Error" message output
- 4 "Safety on" message output
- 5 "STOP1" message output



Special MSI 100/200 features

- 20 safe inputs, 4 safe switching outputs (OSSDs)
- Extension modules with additional input/output modules available for MSI 200
- 4 message outputs, 2 clock switching outputs,
- 2 ground-switching outputs
- Free configuration with MSIsafesoft software
- Comprehensive module library with certified function blocks
- Data stick with configuration memory
- Designs with screw terminals as well as with spring-cage terminals
- Start-up set for quickly getting up to speed

MSI 100/200 functions

- 6 Freely configurable safety base module
- 7 Monitoring of all safe functions in machines and systems
- 8 Safety-oriented expandability with additional input/output modules
- 9 Connection to PROFIBUS / transmission of diagnostic data

Optical Sensor

- Protective sensors Page 692
- Connection types Page 694
- Outputs Page 694

Electrical connection



Observe the operating instructions!
Download from www.leuze.com

Photoel. sensors/
light scanners,
cubic housing

Photoel. sensors/
light scanners,
cylindrical housing

Measuring
Sensors

Ultrasonic
Sensors

Inductive
Switches

Forked
Sensors

Special
Sensors

Fiber Optic
Sensors

Light
Curtains

Protective
Sensors

SENSORS FOR POTENTIALLY EXPLOSIVE AREAS

Part description Part No.:	Device category	Operating range [m]	<input type="checkbox"/> Operating voltage	Light source	Output
Throughbeam sensors					
▶ = Transmitter ◀ = Receiver					
▶ LS 92 / 3 SE - L Ex 50080722 ◀ LS 92 / 3 E - L Ex 50080721	2G, 2D intrinsically safe ia IIC	<input type="checkbox"/> 0 12	5.5 ... 13VDC	Infrared light	NAMUR
Retro-reflective sensors with polarization filter					
PRK 92 / 3 L Ex 50080723	2G, 2D intrinsically safe ia IIC	<input type="checkbox"/> 0.2 ... 5	5.5 ... 13VDC	Red light	NAMUR
Diffuse reflection scanners with background suppression					
FRK 92 / 3 - 300 L Ex 50080724	2G, 2D intrinsically safe ia IIC	<input type="checkbox"/> 0.03 ... 0.3	5.5 ... 13VDC	Infrared light	NAMUR
Isolated switching amplifier					
VS 403 / N 50040825	2G, intrinsically safe NAMUR input ia IIC		18 ... 31.2VDC		NPN
VS 403 / R 50040826	2G, intrinsically safe NAMUR input ia IIC		18 ... 31.2VDC		Relay
VS 403 / R - AC 50040824	2G, intrinsically safe NAMUR input ia IIC		120 ... 230VAC		Relay



Dimensioned drawing 92 Series at www.leuze.com.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50037784	BK7 KB - 092 - 5000 - 4 Ex	Connection cable 5000 mm for intrinsically safe circuits, blue, M12 angular, 4-pin
b 50037783	BK7 KB - 092 - 5000 - 4A Ex	Connection cable 5000 mm for intrinsically safe circuits, blue, M12 axial, 4-pin



Zone 1
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Zone 1
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Zone 2
Page 612



Switching	Connection	Option	Accessories
Light	M12 connector	1, 2	a, b
Light	M12 connector	1, 2	a, b
Light	M12 connector	1, 2	a, b
Light/dark reversible	Terminals	3, 4	
Light/dark reversible	Terminals	3, 4	
Light/dark reversible	Terminals	3, 4	

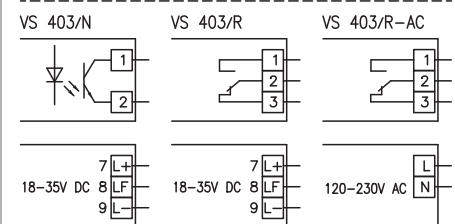
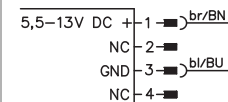


Optical Sensor

- Sensors for potentially explosive areas Page 699
- Connection types Page 694
- Outputs Page 694

Electrical connection

LS 92/3 SE-L Ex
 LS 92/3 E-L Ex
 PRK 92/3 L Ex
 FRK 92/3-300 L Ex



Options

- 1 Operation in combination with isolated switching amplifier VS 403
- 2 Light/dark switching at isolated switching amplifier
- 3 Line fault detection
- 4 Warning output for line fault/auxiliary power failure

SENSORS FOR POTENTIALLY EXPLOSIVE AREAS

Part description Part No.:	Device category	Meas. range ¹⁾ [mm] <input type="checkbox"/>	Operating voltage	Light source Light spot ²⁾	Output
Optical laser distance sensors					
ODSL 96B M/C6 - 2000 Ex d 50106735	2G, 2D, flameproof enclosure	<input type="checkbox"/> 200 <input checked="" type="checkbox"/> 2000	18 ... 30VDC	Red light laser, class 2 2x6mm ²	Analog/mA push-pull/DC

1) Luminosity coefficient 6 ... 90% throughout the entire temperature range, measurement object $\geq 50 \times 50 \text{mm}^2$

2) At 2000mm (ODSL 96B M/C6 - 2000...) or 1200mm (ODS 96 M/V 5510...)



Dimensioned drawings at www.leuze.com.



Ex Sensors

Zone 1, Zone 21



Ex
Sensors

Switching	Connection	Option	Accessories
Configurable	Cable, 5m	1, 2, 3, 4	



AS-interface
Sensors

Accessories

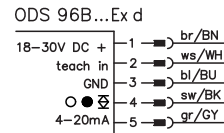
Services

Optical Sensor

- Sensors for potentially explosive areas Page 699
- Connection types Page 694
- Outputs Page 694

Optical Sensor
ABC

Electrical connection



Inductive Switch
ABC

Fiber optic
ABC

Options

- 1 Measurement range and measure mode configurable via software
- 2 OLED display and key pad for configuration
- 3 Teach-in of switching output and analog output
- 4 Teach-in of the switching points via teach input

SENSORS FOR POTENTIALLY EXPLOSIVE AREAS

Part description Part No.:	Device category	Operating range [m] <input type="checkbox"/>	Operating voltage	Light source	Output
Throughbeam sensors acc. to EN 60079-15:2005 and EN 61241-1:2004			▶ = Transmitter ◀ = Receiver		
▶ LSS 96M - 1079 - 23 - Ex n ◀ LSE 96M/P - 3019 - 21 Ex n	50111015 50111016	3G, 3D Protection types nA and tD A22	<input type="text" value="0"/> <input type="text" value="120"/>	10 ... 30VDC	Infrared light 1 x PNP
▶ LSSR 46B, 200 - S12 S - Ex n ◀ LSER 46B/66, 200 - S12 S - Ex n	50111519 50111520	3G, 3D Protection types nA and tD A22	<input type="text" value="0"/> <input type="text" value="50"/>	10 ... 30VDC	Red light 2x Push-pull/DC
Protective throughbeam sensors acc. to EN 60079-15:2005 and EN 61241-1:2004			▶ = Transmitter ◀ = Receiver		
▶ SLSS 96M - 1089 - T2 - 24 Ex n ◀ SLSE 96M/P - 1079 - T2 - 21 Ex n	50111085 50111086	3G, 3D Protection types nA and tD A22	<input type="text" value="0"/> <input type="text" value="50"/>	10 ... 30VDC	Infrared light 1 x PNP



Dimensioned drawings at www.leuze.com.

The **sensors of the 3B, 25B and 55 series** can, with the exception of models HRTR...-L... and HRTR...-XL..., be used in **potentially explosive areas in combination with an Ex protective housing**. Additional information is available on request.

We reserve the right to make changes • Ex_3_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50109217	K - V M12 - Ex	Mechanical connector lock



Zone 1
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Zone 1
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Zone 2
Page 612



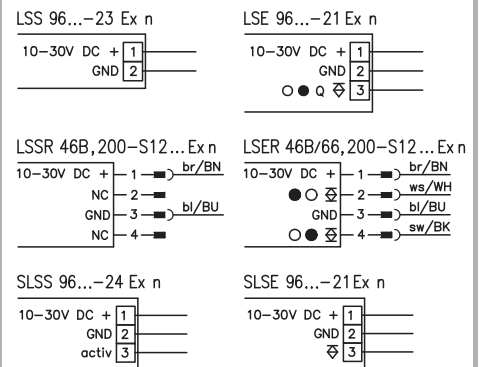
Switching	Connection	Option	Accessories
Light/dark reversible	Terminals		
Light/dark antivalent	Cable 0.2m, with M12 connector	7	a, b, c, d, e
Light	Terminals		



Optical Sensor

- Sensors for potentially explosive areas Page 699
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Adjustment of the switching points via teach buttons
- 3 Autocollimation principle
- 4 Low-temperature version with optics heating
- 5 Shining surfaces
- 6 Transparent media
- 7 Standard housing: ...-S12 S...

SENSORS FOR POTENTIALLY EXPLOSIVE AREAS

Part description Part No.:	Device category	Operating range [m] <input type="checkbox"/>	Operating voltage	Light source	Output
Retro-reflective photoelectric sensors with polarization filter acc. to EN 60079-15:2005 and EN 61241-1:2004					
PRK 46B / 66, 200 - S12 S - Ex n 50108591	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 0.05 ... 15	10 ... 30VDC	Red light	2xPush-pull/DC
PRK 46B / 66.01, 200 - S12 S - Ex n 50108593	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 0.05 ... 15	10 ... 30VDC	Red light	2xPush-pull/DC
IPRK 46B / 4, 200 - S12 S - Ex n 50108945	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 0.05 ... 15	10 ... 30VDC	Red light	1 x PNP



Dimensioned drawings at www.leuze.com.

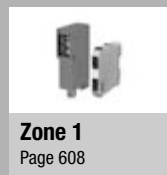
The sensors of the **3B and 25B series** can, with the exception of models HRTR...-L... and HRTR...-XL..., be used in **potentially explosive areas in combination with an Ex protective housing**. Additional information is available on request.

We reserve the right to make changes • Ex_4_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50109217	K - V M12 - Ex	Mechanical connector lock





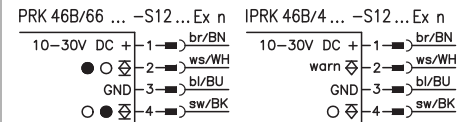
Switching	Connection	Option	Accessories
Light/dark antivalent	Cable 0.2m, with M12 connector	3	a, b, c, d, e
Light/dark antivalent	Cable 0.2m, with M12 connector	1, 3	a, b, c, d, e
Light	Cable 0.2m, with M12 connector	2, 3	a, b, c, d, e



Optical Sensor

- Sensors for potentially explosive areas Page 699
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Warning output
- 3 Standard housing: ...-S12 S...

SENSORS FOR POTENTIALLY EXPLOSIVE AREAS

Part description Part No.:	Device category	Operating range [m] <input type="checkbox"/>	Operating voltage	Light source	Output
Retro-reflective photoelectric sensors with polarization filter acc. to EN 60079-15:2005 and EN 61241-1:2004					
PRK 55 / 6.42 - S8 Ex 50119364	3G, 3D Protection types nA and tc IIIC	<input type="checkbox"/> 0 ... 3.5	10 ... 30VDC	Red light	1 x Push-pull/DC
PRK 55 / 6D.42 - S8.3 Ex 50115207	3G, 3D Protection types nA and tc IIIC	<input type="checkbox"/> 0 ... 3.5	10 ... 30VDC	Red light	1 x Push-pull/DC
PRK 96 M / P - 3369 - 21 Ex n 50111088	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 0.3 ... 15	10 ... 30VDC	Red light	1 x PNP
PRK 96 M / P - 2838 - 28 Ex n 50109523	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 0 ... 7	10 ... 30VDC	Red light	2 x PNP

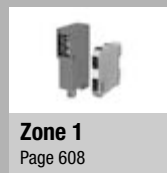


Dimensioned drawings at www.leuze.com.

The sensors of the **3B and 25B series** can, with the exception of models HRTR...-L... and HRTR...-XL..., be used in **potentially explosive areas in combination with an Ex protective housing**. Additional information is available on request.

We reserve the right to make changes • Ex_5_EN.fm

Accessories / connection cables		More accessories can be found from page 634 onwards
Part no.	Designation	Features
a 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC
d 50104520	K - D M8A - 3P - 2m - PVC	Connection cable 2000mm, M12 axial, 3-pin, PVC
e 50104522	K - D M8A - 3P - 5m - PVC	Connection cable 5000mm, M12 axial, 3-pin, PVC
f 50110556	K - D M8A - 3P - 10m - PVC	Connection cable 10000mm, M12 axial, 3-pin, PVC





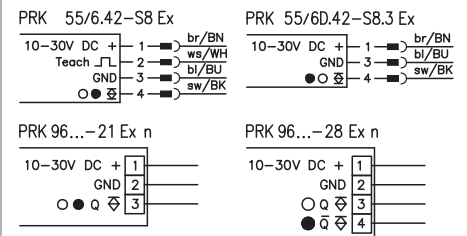
Switching	Connection	Option	Accessories
Light/dark reversible	With M8 connector	3, 4, 5, 6	a, b, c
Dark/light reversible	With M8 connector	2, 4, 5, 6	d, e, f
Light/dark reversible	Terminals	1	
Light/dark antivalent	Terminals	1, 4, 5	



Optical Sensor

- Sensors for potentially explosive areas Page 699
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Adjustment of sensitivity via teach button
- 3 Adjustment of sensitivity via teach button or teach input
- 4 Autocollimation principle
- 5 Transparent media
- 6 316L stainless steel housing in Wash-Down-Design

SENSORS FOR POTENTIALLY EXPLOSIVE AREAS

Part description Part No.:	Device category	Operating range [mm] <input type="checkbox"/>	Operating voltage	Light source	Output
Diffuse reflection light scanners with background suppression acc. to EN 60079-15:2005 and EN 61241-1:2004					
HRTR 46B / 66, 200 - S12 S - Ex n 50108589	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 20 <input type="checkbox"/> 800	10 ... 30VDC	Red light	2x Push-pull/DC
HRT 46B / 66, 200 - S12 S - Ex n 50108587	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 10 <input type="checkbox"/> 1200	10 ... 30VDC	Infrared light	2x Push-pull/DC
IHRT 46B / 4, 200 - S12 S - Ex n 50108943	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 10 <input type="checkbox"/> 1200	10 ... 30VDC	Infrared light	1 x PNP



Dimensioned drawings at www.leuze.com.

The sensors of the **3B and 25B series** can, with the exception of models HRTR...-L... and HRTR...-XL..., be used in **potentially explosive areas in combination with an Ex protective housing**. Additional information is available on request.

We reserve the right to make changes • Ex_6_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
b 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
c 50109217	K - V M12 - Ex	Mechanical connector lock

		
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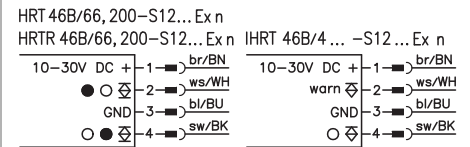
Switching	Connection	Option	Accessories
Light/dark antivalent	Cable 0.2m, with M12 connector	1, 3, 4	a, b, c
Light/dark antivalent	Cable 0.2m, with M12 connector	1, 3, 4	a, b, c
Light	Cable 0.2m, with M12 connector	1, 2, 3, 4	a, b, c



Optical Sensor

- Sensors for potentially explosive areas Page 699
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Warning output
- 3 Light/dark, as well as inclined/sloped surfaces
- 4 Standard housing: ...-S12 S...

SENSORS FOR POTENTIALLY EXPLOSIVE AREAS

Part description Part No.:	Device category	Operating range [mm] <input type="checkbox"/>	Operating voltage	Light source	Output
Diffuse reflection light scanners with background suppression acc. to EN 60079-15:2005 and EN 61241-1:2004					
HRTR 55 / 66 - S8 Ex 50115269	3G, 3D Protection types nA and tC IIIC	<input type="checkbox"/> 5 400	10 ... 30VDC	Red light	2xPush-pull/DC
HRT 96 M / P - 1639 - 800 - 21 Ex n 50111087	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 100 800	10 ... 30VDC	Red light	1 x PNP
HRT 96 M / P - 1649 - 800 - 21 Ex n 50111089	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 100 800	10 ... 30VDC	Red light	1 x PNP
HRT 96 M / P - 3360 - 2500 - 21 Ex n 50108464	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 80 <input type="checkbox"/> 2200	10 ... 30VDC	Red light	Analog/V 2xpush-pull/DC
HRT 96 M / P - 3370 - 5000 - 21.1 Ex n 50112358	3G, 3D Protection types nA and tD A22	<input type="checkbox"/> 100 <input type="checkbox"/> 5000	10 ... 30VDC	Red light laser class 2	3xPush-pull/DC



Dimensioned drawings at www.leuze.com.

The sensors of the **3B** and **25B** series can, with the exception of models HRTR...-L... and HRTR...-XL..., be used in **potentially explosive areas in combination with an Ex protective housing**. Additional information is available on request.

We reserve the right to make changes • Ex_7_EN.fm

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
b 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
c 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC

		
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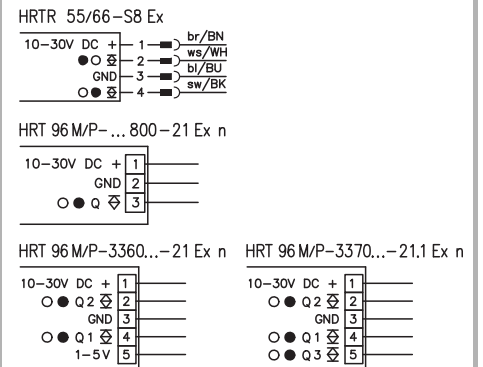
Switching	Connection	Option	Accessories
Light/dark antivalent	With M8 connector	3, 4	a, b, c
Light/dark reversible	Terminals	1	
Light/dark reversible	Terminals	1, 6	
Light/dark antivalent	Terminals	2, 5	
Light/dark reversible	Terminals	1, 5	



Optical Sensor

- Sensors for potentially explosive areas Page 699
- Connection types Page 694
- Outputs Page 694

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Adjustment of the switching points via teach buttons
- 3 Scanning range adjustment via multiturn potentiometer
- 4 316L stainless steel housing in Wash-Down-Design
- 5 Shining surfaces
- 6 Switching delay

AS-INTERFACE SENSORS

Part description Part No.:	Operating range [m] Typ. op. range limit [m]	<input type="checkbox"/> <input type="checkbox"/>	Operating voltage (acc. to AS-i spec.)	Light source	Output
Throughbeam sensors					
▶ = Transmitter ◀ = Receiver					
▶ LSSR 8 / A.8 - S12 ◀ ILSER 8 / A - S12	50038787 50038788	<input type="text" value="0"/> <input type="text" value="12"/> <input type="text" value="0"/> <input type="text" value="20"/>	26.5 ... 31.6V	Red light	AS-interface
▶ LSS 96 M - 180W - 44 ◀ LSE 96 M / A - 182W - 44	50082040 50082039	<input type="text" value="0"/> <input type="text" value="30"/> <input type="text" value="0"/> <input type="text" value="39"/>	26.5 ... 31.6V	Red light	AS-interface
Retro-reflective sensors with polarization filter					
IPRK 8 / A - S12 50038789	<input type="text" value="0.1"/> <input type="text" value="6.4"/> <input type="text" value="0.1"/> <input type="text" value="8"/>		26.5 ... 31.6V	Red light	AS-interface
IPRK 18 / A L.4 50030077	<input type="text" value="0"/> <input type="text" value="2.4"/> <input type="text" value="0"/> <input type="text" value="3"/>		26.5 ... 31.6V	Red light	AS-interface
IPRK 18 / A.1 L.4 50034119	<input type="text" value="0"/> <input type="text" value="2.4"/> <input type="text" value="0"/> <input type="text" value="3"/>		26.5 ... 31.6V	Red light	AS-interface
IPRK 18 / A - L.46 50040278	<input type="text" value="0"/> <input type="text" value="2.4"/> <input type="text" value="0"/> <input type="text" value="3"/>		26.5 ... 31.6V	Red light	AS-interface



Dimensioned drawings see **standard sensors:**
ILSR 8..., IPRK 8... on page 70, IPRK 18... on page 84, LS 96... on page 176.

Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50024748	KB - 095 - 1000 - 3AW	Connection cable 1000mm, M12 axial/angular
b 50024749	KB - 095 - 2000 - 3AW	Connection cable 2000mm, M12 axial/angular
c 50081151	KB - 095 - 5000 - 3AW	Connection cable 5000mm, M12 axial/angular
d 50024346	AM 06	AS-i bus terminal for profile cable



Sensors with AS-interface



Ex
Sensors

AS-interface
Sensors

Accessories

Services

Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

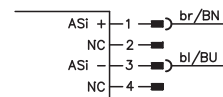
Connection	Option	Accessories	
M12 connector	4, 5, 6, 10, 11	a, b, c, d	
M12 connector	5, 6, 9, 11	a, b, c, d	
M12 connector	5, 6, 10, 11	a, b, c, d	
M12 connector	1, 3, 4, 5, 6, 9, 11	a, b, c, d	
M12 connector	1, 3, 4, 5, 6, 7, 9, 11	a, b, c, d	
M12 connector	2, 3, 5, 6, 7, 8, 10, 11	a, b, c, d	



Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors with polarization filter Page 689
- AS-interface sensors Page 693

Electrical connection



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Teach-in via rotary switch
- 3 Transparent media
- 4 Activation input (via AS-i)
- 5 Switching output with configurable light/dark switching (via AS-i)
- 6 Warning output (via AS-i)
- 7 Pulse stretching
- 8 Contamination compensation (tracking function)
- 9 AS-interface slave address range: 1 ... 31
- 10 AS-interface slave address range: 1 ... 62
- 11 UL approval

AS-INTERFACE SENSORS

Part description Part No.:	Operating range Typ. op. range limit	<input type="checkbox"/> <input type="checkbox"/>	Operating voltage (acc. to AS-i spec.)	Light source	Output
Retro-reflective sensors with polarization filter					
PRK 95 / A L.4 50027095	<input type="text" value="0.18"/> m <input type="text" value="0.3"/> m		26.5 ... 31.6V	Red light	AS-interface
PRK 96 M / A - 3410 - 44 50082067	<input type="text" value="0.3"/> m <input type="text" value="0.1"/> m <input type="text" value="15"/> m <input type="text" value="18"/> m		26.5 ... 31.6V	Red light	AS-interface
Energetic diffuse reflection scanners					
IRTR 8 / A - 800 - S12 50038790	<input type="text" value="10"/> mm <input type="text" value="600"/> mm <input type="text" value="5"/> mm <input type="text" value="800"/> mm		26.5 ... 31.6V	Red light	AS-interface
Diffuse reflection scanners with background suppression					
HRT 96 M / A - 1670 - 800 - 44 50080048	<input type="text" value="100"/> mm <input type="text" value="800"/> mm <input type="text" value="100"/> mm <input type="text" value="1200"/> mm		26.5 ... 31.6V	Red light	AS-interface
HRT 96 M / A - 1660 - 1200 - 44 50025112	<input type="text" value="100"/> mm <input type="text" value="1200"/> mm <input type="text" value="100"/> mm <input type="text" value="1800"/> mm		26.5 ... 31.6V	Infrared light	AS-interface



Dimensioned drawings see **standard sensors:**
IRTR 8... on **page 70**, **PRK 95...** on **page 168**, **PRK 96...** and **HRT 96...** on **page 176**.

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Accessories / connection cables

More accessories can be found from **page 634** onwards

Part no.	Designation	Features
a 50024748	KB - 095 - 1000 - 3AW	Connection cable 1000mm, M12 axial/angular
b 50024749	KB - 095 - 2000 - 3AW	Connection cable 2000mm, M12 axial/angular
c 50081151	KB - 095 - 5000 - 3AW	Connection cable 5000mm, M12 axial/angular
d 50024346	AM 06	AS-i bus terminal for profile cable



AS-i
Page 622



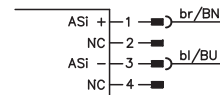
Connection	Option	Accessories	
M12 connector	1, 3, 4, 5, 6, 7, 9	a, b, c, d	
M12 connector	1, 4, 5, 6, 7, 9	a, b, c, d	
M12 connector	1, 5, 6, 8, 9	a, b, c, d	
M12 connector	2, 4, 5, 7, 9	a, b, c, d	
M12 connector	2, 4, 5, 7, 9	a, b, c, d	



Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- AS-interface sensors Page 693













Electrical connection
















Options

- 1 Sensitivity adjustment via potentiometer
- 2 Scanning range adjustment via multiturn potentiometer
- 3 Transparent media
- 4 Activation input (via AS-i)
- 5 Switching output with configurable light/dark switching (via AS-i)
- 6 Warning output (via AS-i)
- 7 AS-interface slave address range: 1 ... 31
- 8 AS-interface slave address range: 1 ... 62
- 9 UL approval

SERIES SELECTION TABLE

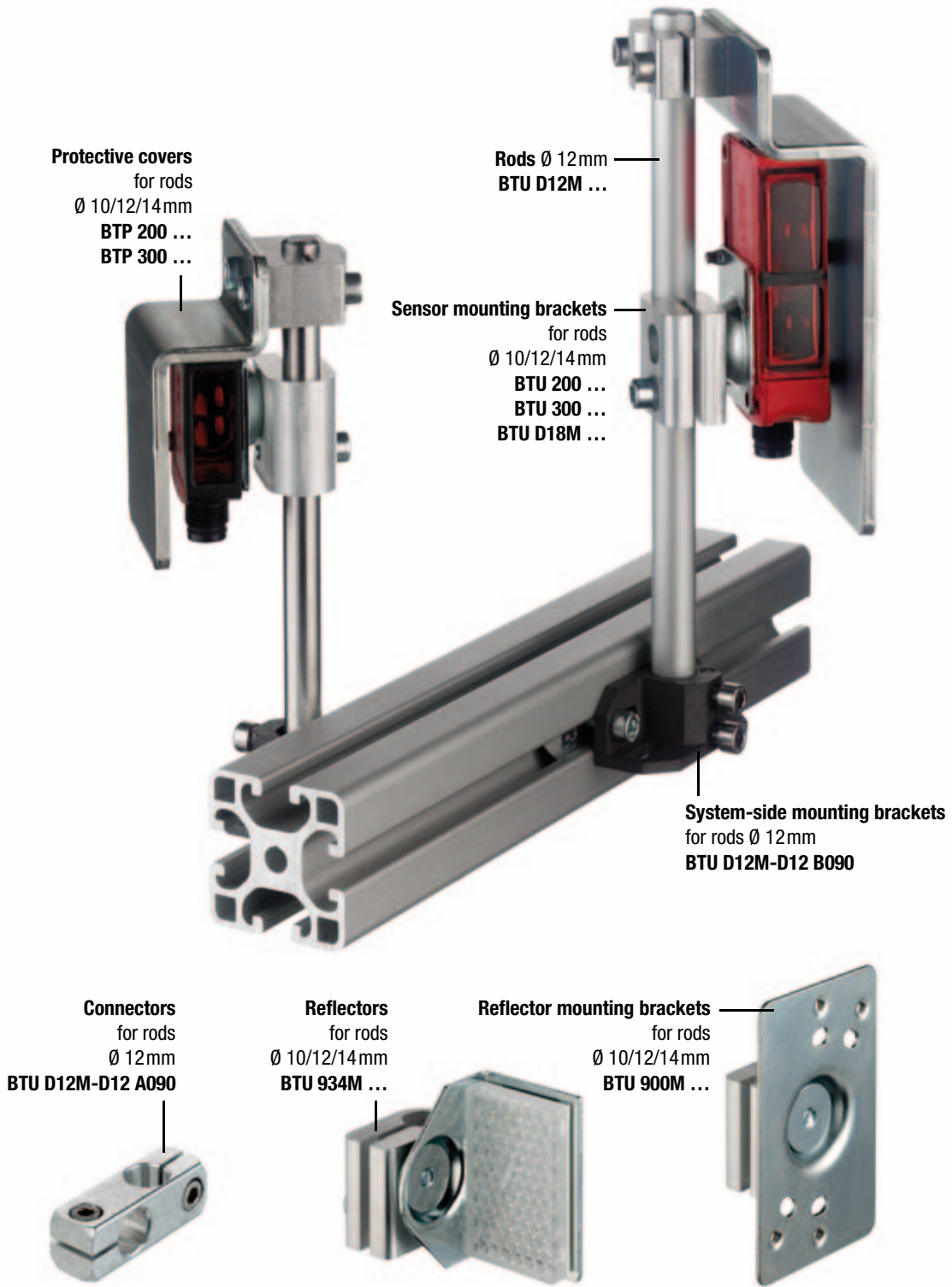
Series	Mounting systems			Other accessories				Page
	Mounting bracket	Mounting system	Mounting clamp	Protective cover	Alignment aid	Diaphragms	Other, series-specific accessories	
 2	•						•	634
 3B	•	•		•			•	629
 5	•	•		•			•	629
 53		•					•	639
 55	•	•					•	629
 25B	•	•		•	•		•	629
 28	•	•		•			•	629
 18	•	•		•			•	629
 8	•	•	•	•	•	•	•	629
 95	•	•					•	639
 46B	•	•		•	•		•	629
 96	•	•			•		•	640

MOUNTING SYSTEMS / OTHER ACCESSORIES


Series	Mounting systems			Other accessories				Page
	Mounting bracket	Mounting system	Mounting clamp	Protective cover	Alignment aid	Diaphragms	Other, series-specific accessories	
 IS 206			•					643
 IS 208	•		•					643
 412 / IS 212	•		•				•	632
 318 / 618 / IS 218	•	•	•			•	•	632
 430 / IS 230	•		•					632
 IS 288			•					643
 ODSL 9	•	•		•				629
 ROD 4					•			644
 GS 61 / GS 63							•	644
 GSU 14C							•	644
 KRTM 20 / CRT 20B / LRT 8		•					•	629
 CML 720	•		•				•	646
 KONTURflex	•		•			•	•	647

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Overview of universal rod mounting system




We reserve the right to make changes • Befestigungen_A_EN.fm



Mounting systems
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Connection technology
Page 648



Reflectors
Page 662

ROD MOUNTING SYSTEM

Ex
Sensors

AS-interface
Sensors



Accessories

Services




Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

Dimensioned drawing	Part description Part No.:	Feature
System-side mounting brackets for rods		
	BTU D12M - D12 - B090 50119333	Mounting bracket for rods Ø 12mm, system-side mounting bracket 2 x M6, hole spacing 27mm ... 45mm, diecast aluminum
Rods / connectors		
	BTU D12M.5 - 045 - M8 50119325	Rod Ø 12mm, length 45mm, stainless steel, with a front M8 thread / 10mm deep, stainless steel
	BTU D12M.5 - 150 50119323	Rod Ø 12mm, length 150mm, stainless steel
	BTU D12M.5 - 250 50119324	Rod Ø 12mm, length 250mm, stainless steel
	BTU D12M - D12 - A090 50119334	90°-connectors for 2 rods Ø 12mm
Sensor mounting bracket for rod mounting		
	BTU 200M - D10 50117256	Sensor mounting bracket for rod Ø 10mm or cheek 1.5 ... 4mm, for series 3B, 5, 18, 25B, 28, 55
	BTU 200M - D12 50117255	Sensor mounting bracket for rod Ø 12mm or cheek 1.5 ... 4mm, for series 3B, 5, 18, 25B, 28, 55
	BTU 200M - D14 50117254	Sensor mounting bracket for rod Ø 14mm or cheek 1.5 ... 4mm, for series 3B, 5, 18, 25B, 28, 55
	BTU 300M - D10 50117253	Sensor mounting bracket for rod Ø 10mm or cheek 1.5 ... 4mm, for series 8, 9, 46B, LRT 8
	BTU 300M - D12 50117252	Sensor mounting bracket for rod Ø 12mm or cheek 1.5 ... 4mm, for series 8, 9, 46B, LRT 8
	BTU 300M - D14 50117251	Sensor mounting bracket for rod Ø 14mm or cheek 1.5 ... 4mm, for series 8, 9, 46B, LRT 8

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
Sensor mounting bracket for rod mounting		
	BTU D18M - D12 50117490	Sensor mounting bracket for rod \varnothing 12 mm or cheek 1.5 ... 4 mm, for series 318(B), 418, 618, IS 218
Reflector mounting brackets for rod mounting		
	BTU 900M - D10 50119332	Reflector mounting bracket for rod \varnothing 10 mm or cheek 1.5 ... 4 mm, for reflectors (M)TKS 30x50, (M)TKS 40x60, TKS 50x50
	BTU 900M - D12 50119331	Reflector mounting bracket for rod \varnothing 12 mm or cheek 1.5 ... 4 mm, for reflectors (M)TKS 30x50, (M)TKS 40x60, TKS 50x50
	BTU 900M - D14 50119330	Reflector mounting bracket for rod \varnothing 14 mm or cheek 1.5 ... 4 mm, for reflectors (M)TKS 30x50, (M)TKS 40x60, TKS 50x50
Reflectors for rod mounting		
	BTU 934M - D10 - 90 50120011	Reflector for rod \varnothing 10 mm or cheek 1.5 ... 4 mm, with reflector TKA 30x46 (see p.665)
	BTU 934M - D12 - 90 50120019	Reflector for rod \varnothing 12 mm or cheek 1.5 ... 4 mm, with reflector TKA 30x46 (see p.665)
	BTU 934M - D14 - 90 50120010	Reflector for rod \varnothing 14 mm or cheek 1.5 ... 4 mm, with reflector TKA 30x46 (see p.665)


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Mounting systems
Page 630



Connection technology
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Reflectors
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ROD MOUNTING SYSTEM

Ex
Sensors

AS-interface
Sensors

Accessories

Services

Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

Dimensioned drawing

Part description
Part No.:

Feature

Sensor protective covers for rod mounting



BTP 200M - D10
50117830

Sensor protective cover for rod
Ø 10 mm or cheek 1.5 ... 4 mm,
for series 3B, 5, 18, 25B, 28, 55

BTP 200M - D12
50117829

Sensor protective cover for rod
Ø 12 mm or cheek 1.5 ... 4 mm,
for series 3B, 5, 18, 25B, 28, 55

BTP 200M - D14
50117828

Sensor protective cover for rod
Ø 14 mm or cheek 1.5 ... 4 mm,
for series 3B, 5, 18, 25B, 28, 55



BTP 300M - D10
50117827

Sensor protective cover for rod
Ø 10 mm or cheek 1.5 ... 4 mm,
for series 8, 9, 46B, LRT 8



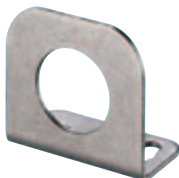
BTP 300M - D12
50117826

Sensor protective cover for rod
Ø 12 mm or cheek 1.5 ... 4 mm,
for series 8, 9, 46B, LRT 8

BTP 300M - D14
50117825

Sensor protective cover for rod
Ø 14 mm or cheek 1.5 ... 4 mm,
for series 8, 9, 46B, LRT 8

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
Sensor mounting bracket		
	BT 200M.5 50118542	Mounting bracket, stainless steel, for series 3B, 5, 25B, 28, 55 sensors
	BT 300M.5 50118543	Mounting bracket, stainless steel, for series 8, 9, 46B, LRT 8 sensors
	BT D12M.5 50113549	Mounting bracket, stainless steel, for series 412, IS 212 cylindrical sensors
	BT D18M.5 50113548	Mounting bracket, stainless steel, for series 318(B), 418, 618, IS 218 cylindrical sensors
	BT D30M.5 50113510	Mounting bracket, stainless steel, for series 430, IS 230 cylindrical sensors


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Mounting systems
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Connection technology
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Reflectors
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UNIVERSAL MOUNTING DEVICES / OTHER

Ex
Sensors

AS-interface
Sensors

Accessories

Services

Optical Sensor
ABC

Inductive Switch
ABC

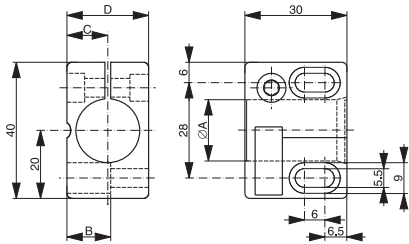
Fiber optic
ABC

Dimensioned drawing

Part description
Part No.:

Feature

Mounting clamp for cylindrical sensors



MC 012K
50111499

Mounting clamp without limit stop, for series 412, IS 212 cylindrical sensors
ØA = 12mm, B = 9.75mm, C = 9mm, D = 18mm

MC 012K - LS
50111500

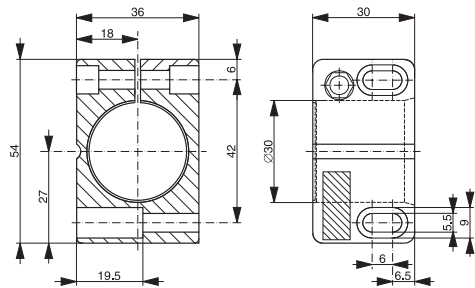
Mounting clamp with limit stop, for series 412, IS 212 cylindrical sensors
ØA = 12mm, B = 9.75mm, C = 9mm, D = 18mm

MC 018K
50111501

Mounting clamp without limit stop, for series 318(B), 418, 618, IS 218 cylindrical sensors
ØA = 18mm, B = 12.85mm, C = 12mm, D = 24mm

MC 018K - LS
50111502

Mounting clamp with limit stop, for series 318(B), 418, 618, IS 218 cylindrical sensors
ØA = 18mm, B = 12.85mm, C = 12mm, D = 24mm



MC 030K
50111503

Mounting bracket without limit stop, for series 430, IS 230 cylindrical sensors

MC 030K - LS
50111504

Mounting bracket with limit stop, for series 430, IS 230 cylindrical sensors

Material of all MC 0...K mounting clamps: polyamide (PA 66)




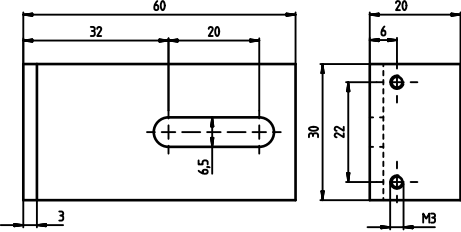
Mechanical-optical alignment aid



SAT 5
50109545

Sensorscope - mechanical-optical alignment aid, suitable for throughbeam- and safety-throughbeam photoelectric sensors

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
2 Series		
	BT 002M.5 50112206	Mounting bracket
3B Series		
	BT 3 50060511	Mounting bracket
	BT 3.1 50105585	Retaining clip + 2 oval-head screws M3 x 16
	BT 3.5 50111830	Retaining clip + 2 oval-head screws M3 x 16, stainless steel model
	BT 3B 50105546	Mounting bracket + retaining clip + 2 oval-head screws M3 x 16
	BT 3.2 50103844	Adapter plate for alternate mounting of 3B Series sensors on 25.4 mm hole spacing
	BT 003M.1 50115197	Mounting bracket


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Connection technology
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Reflectors
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SERIES-SPECIFIC ACCESSORIES

Ex
Sensors

AS-interface
Sensors




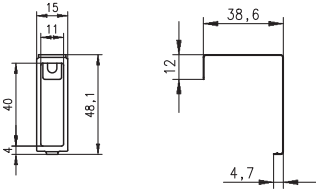
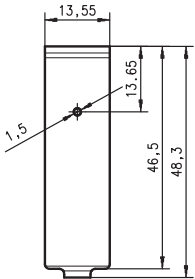
Accessories

Services

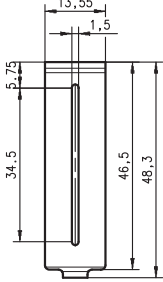
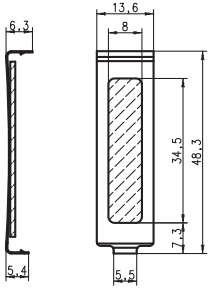

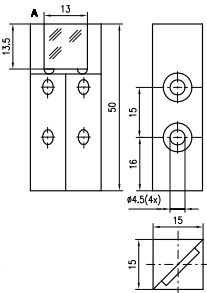
Optical Sensor
ABC

Inductive Switch
ABC

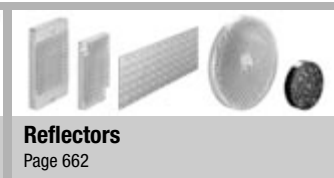
Fiber optic
ABC

Dimensioned drawing	Part description Part No.:	Feature
8 Series		
	BT 8 50036195	Mounting bracket
	BT 8 - 0 50036196	Mounting block for dovetail
	BT 8 - ARH 50035030	Mounting/alignment system for laser sensors
	BS 8 50041067	Control guard
	BL 8 50040279	Pin diaphragm



ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
8 Series		
	<p>BL 8.1 50040280</p>	<p>Slit diaphragm</p>
	<p>SG 8 50113307</p>	<p>Protective glass, consisting of a metal frame with glass included, snap-in mounting</p>
18 Series		
	<p>BT 95 50020833</p>	<p>Mounting bracket</p>
 <p>A View turned by 45°</p>	<p>US 18 50080987</p>	<p>90° deflection mirror</p>

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SERIES-SPECIFIC ACCESSORIES

Dimensioned drawing	Part description Part No.:	Feature
25B Series		
	BT 25 50040269	Mounting bracket
	PRKL 25B - S12 50108005	Laser pointer, can be used as alignment aid

Ex
Sensors

AS-interface
Sensors

Accessories


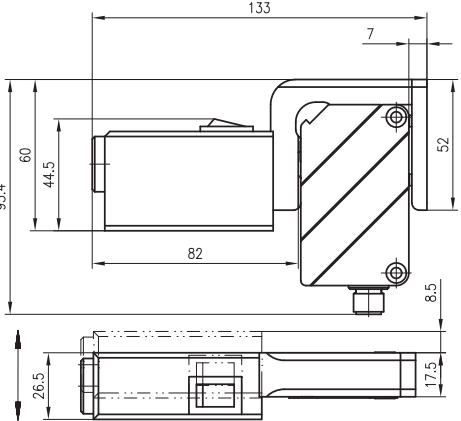
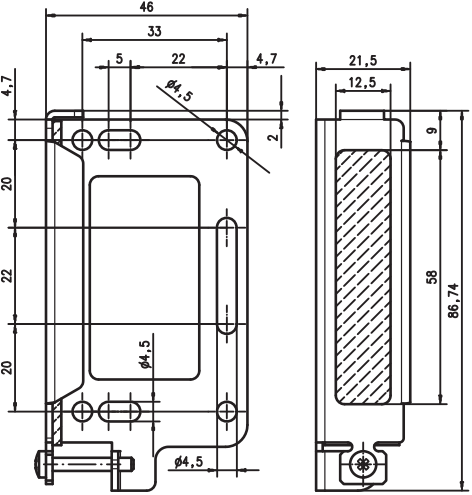
Services

Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
46B Series		
	BT 46 50105315	Mounting bracket
	ARH 46 50040739	Alignment aid
	SG 46 50117243	Protective glass, consisting of a metal frame with glass included, snap-in mounting


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Mounting systems
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Connection technology
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Reflectors
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SERIES-SPECIFIC ACCESSORIES

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Sensors

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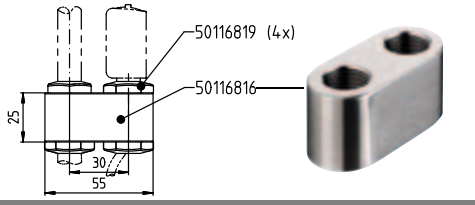
Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

Dimensioned drawing	Part description Part No.:	Feature
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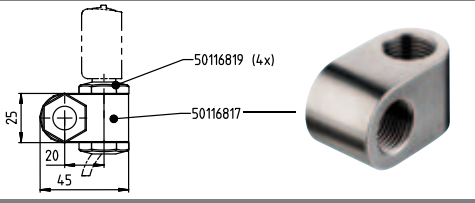
53 Series



BTU 053M.5F - D12 - A180
50116816

Mounting system for D = 12mm rod for parallel connection of rod and sensor or of two stainless steel 316L rods

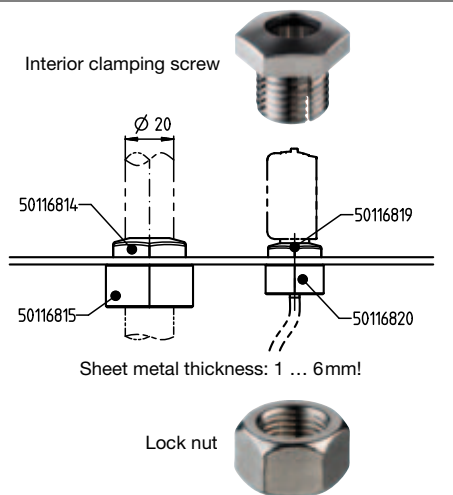
Attention! Please include 4 x BTU 053M.5F-D12-SS interior clamping screws, part no. 50116819 in your order (see below).



BTU 053M.5F - D12 - A090
50116817

Mounting system for D = 12mm rod for 90° connection of rod and sensor or of two stainless steel 316L rods

Attention! Please include 4 x BTU 053M.5F-D12-SS interior clamping screws, part no. 50116819 in your order (see below).



BTU 053M.5F - D20 - SS
50116814

M24x1.5 interior clamping screw for stainless steel 316L rod/pipe with D = 20mm, FPM/black double seal

BTU 053M.5F - D20 - N
50116815

Lock nut for M24x1.5 interior clamping screw for stainless steel 316L rod/pipe with D = 20mm

BTU 053M.5F - D12 - SS
50116819

M16x1.5 interior clamping screw for stainless steel 316L rod/53 series sensor with D = 12mm, FPM/black double seal

BTU 053M.5F - D12 - N
50116820

Lock nut for M16x1.5 interior clamping screw for stainless steel 316L rod/53 series sensor with D = 12mm





95 Series



BT 95
50020833

Mounting bracket

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
95 Series		
	UMS 96 - 95 50080334	Mounting system
96 Series		
	BT 96 50025570	Mounting bracket
	BT 96.1 50080614	Mounting device
	BT 96.4 50032319	Mounting bracket


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Mounting systems
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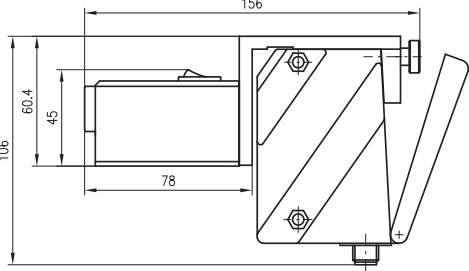



Connection technology
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Reflectors
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SERIES-SPECIFIC ACCESSORIES

Dimensioned drawing	Part description Part No.:	Feature
96 Series		
	BT 450.1 - 96 50082084	Through-hole mount for rod D = 10 mm
	BT 450.3 - 96 50104897	Through-hole mount for rod D = 12 mm
	UMS 96 50026204	Universal mounting system
	ARH 96 50080502	Laser alignment aid
318(B) Series		
	BT D21M 50117257	Mounting bracket for the 318B series with sensor holder \varnothing 21 mm for inclined positioning of the sensors when used with spherical mounting nuts

Ex
Sensors

AS-interface
Sensors

Accessories



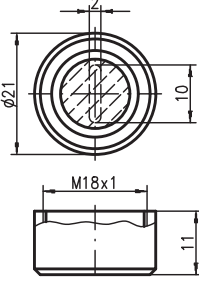
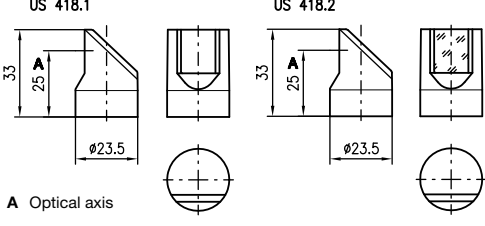
Services

Optical Sensor
ABC


Inductive Switch
ABC

Fiber optic
ABC

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
318(B) Series		
 <p>BT 318P - LS</p> <p>BT D18M.5 see p.632</p> <p>BT 318P - LS</p>	<p>BT 318P - LS 50117258</p>	<p>Front diaphragm for nearly flush mounting of 318B series sensors</p>
	<p>BT 318 - ARH 50083189</p>	<p>Mounting/alignment system for laser sensors</p>
	<p>BL 318.1 50082008</p>	<p>Slit diaphragm for 318 Series</p>
 <p>US 418.1</p> <p>US 418.2</p> <p>A Optical axis</p>	<p>US 418.1 50080130</p> <p>US 418.2 50080131</p>	<p>90° deflector attachment (open version) for diffuse reflection scanners</p> <p>90° deflector attachment (closed version)</p>


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Reflectors
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SERIES-SPECIFIC ACCESSORIES

Ex
Sensors

AS-interface
Sensors

Accessories

Services

Optical Sensor
ABC

Inductive Switch
ABC

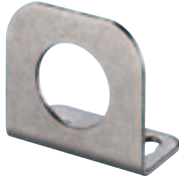
Fiber optic
ABC

Dimensioned drawing

Part description
Part No.:

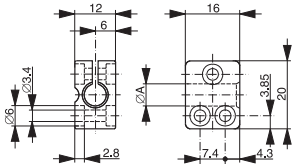
Feature

IS 206, IS 208, IS 288 Series (inductive switches)



BT D08M.5
50113550

Mounting bracket for IS 208... inductive switches



MC 006K
50111496

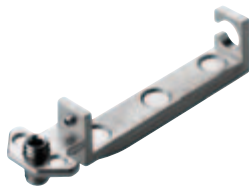
Mounting clamp for IS 206... inductive switches, without limit stop, ØA = 6.5mm

MC 008K
50111497

Mounting clamp for IS 208... inductive switches, without limit stop, ØA = 8mm

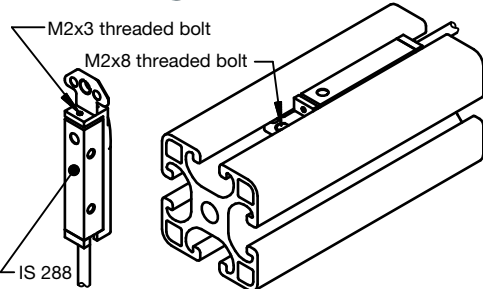
MC 008K - LS
50111498

Mounting clamp for IS 208... inductive switches, with limit stop, ØA = 8mm



BTC 088M - 140
50115600

Mounting clamp for IS 288 inductive switches for mounting into the groove of an ITEM profile with 40mm grid



ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
ROD 4		
	<p>ROD 4 - MS 50038066</p>	<p>Mounting system / mounting plate</p>
Other accessories for optical forked sensors (I)GS 61 / 63		
	<p>BT - GS6X.L 50112215</p>	<p>Mounting device for forked sensors (I)GS 61 / 63</p>
Other accessories for ultrasonic forked sensors GSU 14C		
	<p>FS 14BM.5 50114055</p>	<p>Replacement rail for standard design GSU 14C</p>
	<p>FS 14BML.5 50114056</p>	<p>Extended guide rail for GSU 14C, 260mm long</p>


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SERIES-SPECIFIC ACCESSORIES

Dimensioned drawing	Part description Part No.:	Feature
KRT... 20 contrast scanners		
	UMS 96 50026204	Universal mounting system
	OB 12 - KRT 20 50034051	Optics 12mm
	OB 20 - KRT 20 50034050	Optics 20mm
	OB 50 - KRT 20 50034049	Optics 50mm
	WZ - OB - KRT 20 50034118	Tool for changing lenses



Mounting systems for optical distance sensors, ultrasonic sensors, fiber optic amplifiers, protective sensors and AS-interface sensors can be found with the mounting accessories for the respective standard sensors.

ACCESSORIES / MOUNTING SYSTEMS / OTHER

Dimensioned drawing	Part description Part No.:	Feature
CML 720 light curtains		
	BT - 4NC 425725	4 sliding blocks
	BT - 2R1 429046	Bracket set 360° (consisting of 2 x BT 360°)
	BT - 2L 429056	L-angle bracket set (consisting of 2 x BT-L)
	BT - 2Z 429057	Z-angle bracket set (consisting of 2 x BT-Z)
	BT - 2P40 424417	Mounting clamp set for mounting in device columns (consisting of 2 x BT-P40)
	BT - 2SSD 429058	2 brackets, L=70mm, swivel by ± 8°, vibration damper, incl. 4 screws/4 sliding blocks
	BT - 2SSD - 270 429049	2 brackets, L=270mm, swiveling, vibration damper, incl. 4 screws/4 sliding blocks


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Mounting systems
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SERIES-SPECIFIC ACCESSORIES

Ex
Sensors

AS-interface
Sensors

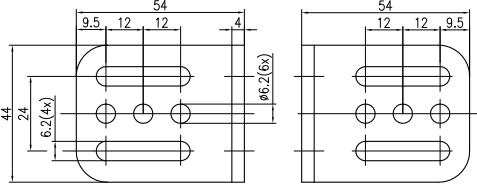


Accessories

Services


Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

Dimensioned drawing	Part description Part No.:	Feature	
KONTURflex light curtains			
	BT - 2S 560120	2 mounting brackets	
	BT - 2SSD 429058	2 brackets, L=70mm, swivel by $\pm 8^\circ$, vibration damper, incl. 4 screws/4 sliding blocks	
	BT - 4NC 425725	4 sliding blocks	
KONTURflex-480 diaphragm profile 345914			Pin diaphragm for KONTURflex, measurement field length 480mm
KONTURflex-640 diaphragm profile 345909			Pin diaphragm for KONTURflex, measurement field length 640mm
KONTURflex-1280 diaphragm profile 345915			Pin diaphragm for KONTURflex, measurement field length 1280mm
KONTURflex-1600 diaphragm profile 345916			Pin diaphragm for KONTURflex, measurement field length 1600mm
KONTURflex-1920 diaphragm profile 345919			Pin diaphragm for KONTURflex, measurement field length 1920mm
KONTURflex-2560 diaphragm profile 345925			Pin diaphragm for KONTURflex, measurement field length 2560mm

ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature						
Connection cables with M8 connector, 3-pin socket, open cable end								
	K - D M8A - 3P - 2m - PVC 50104520	Connection cable 2000 mm, M8 axial, 3-pin, PVC						
	K - D M8W - 3P - 2m - PVC 50104521	Connection cable 2000 mm, M8 angular, 3-pin, PVC						
	K - D M8A - 3P - 5m - PVC 50104522	Connection cable 5000 mm, M8 axial, 3-pin, PVC						
	K - D M8W - 3P - 5m - PVC 50104523	Connection cable 5000 mm, M8 angular, 3-pin, PVC						
	K - D M8A - 3P - 10m - PVC 50110556	Connection cable 10000 mm, M8 axial, 3-pin, PVC						
	K - D M8W - 3P - 10m - PVC 50110559	Connection cable 10000 mm, M8 angular, 3-pin, PVC						
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	1	br/BN						
	3	bl/BU						
	4	sw/BK						
	K - D M8W - 3P - 2m - PUR 50110557	Connection cable 2000 mm, M8 angular, 3-pin, PUR						
	K - D M8A - 3P - 5m - PUR 50106691	Connection cable 5000 mm, M8 axial, 3-pin, PUR						
	K - D M8W - 3P - 5m - PUR 50106692	Connection cable 5000 mm, M8 angular, 3-pin, PUR						
	K - D M8A - 3P - 10m - PUR 50106693	Connection cable 10000 mm, M8 axial, 3-pin, PUR						
	K - D M8W - 3P - 10m - PUR 50110558	Connection cable 10000 mm, M8 angular, 3-pin, PUR						


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Reflectors
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ACCESSORIES / CONNECTION TECHNOLOGY

Ex
Sensors

AS-interface
Sensors

Accessories

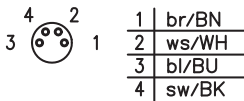
Services

Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

Contact assignment	Part description Part No.:	Feature
Connection cables with M8 connector, 4-pin socket, open cable end		
	K - D M8A - 4P - 2m - PVC 50104524	Connection cable 2000mm, M8 axial, 4-pin, PVC
	K - D M8W - 4P - 2m - PVC 50104525	Connection cable 2000mm, M8 angular, 4-pin, PVC
	K - D M8A - 4P - 5m - PVC 50104526	Connection cable 5000mm, M8 axial, 4-pin, PVC
	K - D M8W - 4P - 5m - PVC 50104527	Connection cable 5000mm, M8 angular, 4-pin, PVC
	K - D M8A - 4P - 10m - PVC 50104528	Connection cable 10000mm, M8 axial, 4-pin, PVC
	K - D M8W - 4P - 10m - PVC 50104529	Connection cable 10000mm, M8 angular, 4-pin, PVC
	K - D M8A - 4P - 20m - PVC 50115424	Connection cable 20000mm, M8 axial, 4-pin, PVC
	K - D M8A - 4P - 2m - PUR 50104530	Connection cable 2000mm, M8 axial, 4-pin, PUR
	K - D M8W - 4P - 2m - PUR 50104531	Connection cable 2000mm, M8 angular, 4-pin, PUR
	K - D M8A - 4P - 5m - PUR 50104532	Connection cable 5000mm, M8 axial, 4-pin, PUR
	K - D M8W - 4P - 5m - PUR 50104761	Connection cable 5000mm, M8 angular, 4-pin, PUR
	K - D M8A - 4P - 10m - PUR 50104533	Connection cable 10000mm, M8 axial, 4-pin, PUR
	K - D M8W - 4P - 10m - PUR 50104534	Connection cable 10000mm, M8 angular, 4-pin, PUR



ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cables with M8 connector, 4-pin socket, open cable end, with integrated LEDs		
	K - D M8W - 4P - 2m - DP - PUR 50104535	Connection cable 2000mm, M8 angular, 4-pin, PUR, 2 integrated LEDs (PNP)
	K - D M8W - 4P - 5m - DP - PUR 50104536	Connection cable 5000mm, M8 angular, 4-pin, PUR, 2 integrated LEDs (PNP)
Connection cables with M8 connector, 4-pin socket, open cable end, for the food and beverage industries		
	K - D M8A - 4P - 2m - FAB 50106152	Connection cable 2000mm, M8 axial, 4-pin, PVC, Food & Beverage version
	K - D M8W - 4P - 2m - FAB 50106154	Connection cable 2000mm, M8 angular, 4-pin, PVC, Food & Beverage version
	K - D M8A - 4P - 5m - FAB 50106153	Connection cable 5000mm, M8 axial, 4-pin, PVC, Food & Beverage version
	K - D M8W - 4P - 5m - FAB 50106155	Connection cable 5000mm, M8 angular, 4-pin, PVC, Food & Beverage version
	K - D M8A - 4P - 10m - FAB 50110274	Connection cable 10000mm, M8 axial, 4-pin, PVC, Food & Beverage version
	K - D M8W - 4P - 10m - FAB 50110273	Connection cable 10000mm, M8 angular, 4-pin, PVC, Food & Beverage version


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Mounting systems
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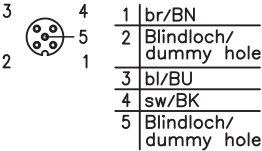


Connection technology
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Reflectors
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ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cables with M12 connector, 3-pin socket, open cable end		
	K - D M12A - 3P - 2m - PVC 50104538	Connection cable 2000 mm, M12 axial, 3-pin, PVC
	K - D M12W - 3P - 2m - PVC 50104539	Connection cable 2000 mm, M12 angular, 3-pin, PVC
	K - D M12A - 3P - 5m - PVC 50104540	Connection cable 5000 mm, M12 axial, 3-pin, PVC
	K - D M12W - 3P - 5m - PVC 50104541	Connection cable 5000 mm, M12 angular, 3-pin, PVC

Ex
Sensors

AS-interface
Sensors

Accessories


Services

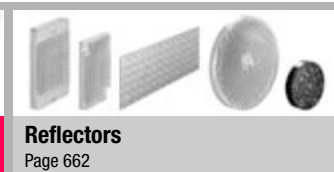
Optical Sensor
ABC

Inductive Switch
ABC



Fiber optic
ABC

ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature										
Connection cables with M12 connector, 4-pin socket, open cable end												
	K - D M12A - 4P - 2m - PVC 50104542	Connection cable 2000mm, M12 axial, 4-pin, PVC										
	K - D M12W - 4P - 2m - PVC 50104543	Connection cable 2000mm, M12 angular, 4-pin, PVC										
	K - D M12A - 4P - 5m - PVC 50104544	Connection cable 5000mm, M12 axial, 4-pin, PVC										
	K - D M12W - 4P - 5m - PVC 50104545	Connection cable 5000mm, M12 angular, 4-pin, PVC										
 <p>3 4 2 5 1</p> <table border="1"> <tr><td>1</td><td>br/BN</td></tr> <tr><td>2</td><td>ws/WH</td></tr> <tr><td>3</td><td>bl/BU</td></tr> <tr><td>4</td><td>sw/BK</td></tr> <tr><td>5</td><td>Blindloch/ dummy hole</td></tr> </table>	1	br/BN	2	ws/WH	3	bl/BU	4	sw/BK	5	Blindloch/ dummy hole	K - D M12A - 4P - 10m - PVC 50104546	Connection cable 10000mm, M12 axial, 4-pin, PVC
1	br/BN											
2	ws/WH											
3	bl/BU											
4	sw/BK											
5	Blindloch/ dummy hole											
	K - D M12W - 4P - 10m - PVC 50104547	Connection cable 10000mm, M12 angular, 4-pin, PVC										
	K - D M12A - 4P - 20m - PVC 50104753	Connection cable 20000mm, M12 axial, 4-pin, PVC										
	K - D M12W - 4P - 20m - PVC 50113473	Connection cable 20000mm, M12 angular, 4-pin, PVC										



ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cables with M12 connector, 4-pin socket, open cable end		
 <p>3 4 2 5 1 1</p> <p>1 br/BN 2 ws/WH 3 bl/BU 4 sw/BK 5 Blindloch/ dummy hole</p>	K - D M12A - 4P - 2m - PUR 50104561	Connection cable 2000mm, M12 axial, 4-pin, PUR
	K - D M12W - 4P - 2m - PUR 50104562	Connection cable 2000mm, M12 angular, 4-pin, PUR
	K - D M12A - 4P - 5m - PUR 50104563	Connection cable 5000mm, M12 axial, 4-pin, PUR
	K - D M12W - 4P - 5m - PUR 50104564	Connection cable 5000mm, M12 angular, 4-pin, PUR
	K - D M12A - 4P - 10m - PUR 50104565	Connection cable 10000mm, M12 axial, 4-pin, PUR
	K - D M12W - 4P - 10m - PUR 50104566	Connection cable 10000mm, M12 angular, 4-pin, PUR
Connection cables for intrinsically safe circuits with M12 connector, 4-pin socket, open cable end		
 <p>3 4 2 5 1 1</p> <p>1 br/BN 2 ws/WH 3 bl/BU 4 sw/BK 5 Blindloch/ dummy hole</p>	BK7 KB - 092 - 5000 - 4A Ex 50113400	Connection cable 5000mm for intrinsically safe circuits, blue, M12 axial, 4-pin
	BK7 KB - 092 - 5000 - 4 Ex 50113399	Connection cable 5000mm for intrinsically safe circuits, blue, M12 angular, 4-pin

Ex
SensorsAS-interface
Sensors

Accessories

Services

Optical Sensor
ABCInductive Switch
ABCFiber optic
ABC

ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cables with M12 connector, 4-pin socket, open cable end, with integrated LEDs		
 	K - D M12A - 4P - 2m - DP - PUR 50104548	Connection cable 2000mm, M12 axial, 4-pin, PUR, 2 integrated LEDs (PNP)
	K - D M12W - 4P - 2m - DP - PUR 50104549	Connection cable 2000mm, M12 angular, 4-pin, PUR, 2 integrated LEDs (PNP)
	K - D M12A - 4P - 5m - DP - PUR 50104550	Connection cable 5000mm, M12 axial, 4-pin, PUR, 2 integrated LEDs (PNP)
	K - D M12W - 4P - 5m - DP - PUR 50104551	Connection cable 5000mm, M12 angular, 4-pin, PUR, 2 integrated LEDs (PNP)
	K - D M12A - 4P - 10m - DP - PUR 50104552	Connection cable 10000mm, M12 axial, 4-pin, PUR, 2 integrated LEDs (PNP)
	K - D M12W - 4P - 10m - DP - PUR 50104553	Connection cable 10000mm, M12 angular, 4-pin, PUR, 2 integrated LEDs (PNP)
Connection cables with M12 connector, 4-pin socket, open cable end, for the food and beverage industries		
	K - D M12A - 4P - 2m - FAB 50104570	Connection cable 2000mm, M12 axial, 4-pin, PVC, Food & Beverage version
	K - D M12W - 4P - 2m - FAB 50104571	Connection cable 2000mm, M12 angular, 4-pin, PVC, Food & Beverage version
	K - D M12A - 4P - 5m - FAB 50104572	Connection cable 5000mm, M12 axial, 4-pin, PVC, Food & Beverage version
	K - D M12W - 4P - 5m - FAB 50104573	Connection cable 5000mm, M12 angular, 4-pin, PVC, Food & Beverage version
	K - D M12A - 4P - 10m - FAB 50112960	Connection cable 10000mm, M12 axial, 4-pin, PVC, Food & Beverage version
	K - D M12W - 4P - 10m - FAB 50112961	Connection cable 10000mm, M12 angular, 4-pin, PVC, Food & Beverage version


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Connection technology
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ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cables with M12 connector, 5-pin socket, open cable end		
	K - D M12A - 5P - 2m - PVC 50104555	Connection cable 2000 mm, M12 axial, 5-pin, PVC
	K - D M12W - 5P - 2m - PVC 50104556	Connection cable 2000 mm, M12 angular, 5-pin, PVC
	K - D M12A - 5P - 5m - PVC 50104557	Connection cable 5000 mm, M12 axial, 5-pin, PVC
	K - D M12W - 5P - 5m - PVC 50104558	Connection cable 5000 mm, M12 angular, 5-pin, PVC
	K - D M12A - 5P - 10m - PVC 50104559	Connection cable 10000 mm, M12 axial, 5-pin, PVC
	K - D M12W - 5P - 10m - PVC 50104560	Connection cable 10000 mm, M12 angular, 5-pin, PVC
	K - D M12A - 5P - 2m - PUR 50104567	Connection cable 2000 mm, M12 axial, 5-pin, PUR
	K - D M12W - 5P - 2m - PUR 50104568	Connection cable 2000 mm, M12 angular, 5-pin, PUR
	K - D M12A - 5P - 5m - PUR 50104569	Connection cable 5000 mm, M12 axial, 5-pin, PUR
	K - D M12W - 5P - 5m - PUR 50104762	Connection cable 5000 mm, M12 angular, 5-pin, PUR

3	4	1	br/BN
		2	ws/WH
2		3	bl/BU
		4	sw/BK
		5	gr/GY

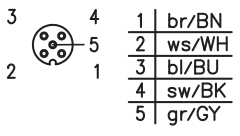
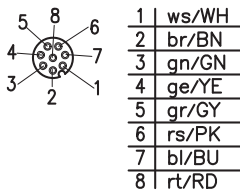
Ex
SensorsAS-interface
Sensors

Accessories

Services

Optical Sensor
ABCInductive Switch
ABCFiber optic
ABC

ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cables with M12 connector, 5-pin socket, open cable end, for the food and beverage industries		
	K - D M12A - 5P - 2m - FAB 50104574	Connection cable 2000 mm, M12 axial, 5-pin, PVC, Food & Beverage version
	K - D M12W - 5P - 2m - FAB 50104575	Connection cable 2000 mm, M12 angular, 5-pin, PVC, Food & Beverage version
	K - D M12A - 5P - 5m - FAB 50104576	Connection cable 5000 mm, M12 axial, 5-pin, PVC, Food & Beverage version
	K - D M12W - 5P - 5m - FAB 50104577	Connection cable 5000 mm, M12 angular, 5-pin, PVC, Food & Beverage version
Connection cables with M12 connector, 8-pin socket, open cable end		
	K - D M12A - 8P - 2m - PUR 50104591	Connection cable 2000 mm, M12 axial, 8-pin, shielded, PUR
	K - D M12A - 8P - 5m - PUR 50104590	Connection cable 5000 mm, M12 axial, 8-pin, shielded, PUR
	K - D M12A - 8P - 10m - PUR 50106882	Connection cable 10000 mm, M12 axial, 8-pin, shielded, PUR

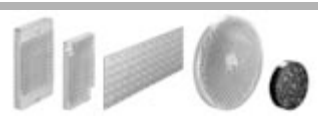
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Mounting systems
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


Connection technology
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ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature										
Adapter cables with M8/M12 connector, 4-pin												
	K - DS M8A - M12A - 4P - 0.3m - PVC 50107276	Adapter line 300mm, axial M8 socket, axial M12 connector, 4-pin, PVC. Simple connection of sensors with M8 connectors to M12 connection technology possible										
	K - DS M12A - M8A - 4P - 0.3m - PVC 50116738	Adapter line 300mm, axial M12 socket, axial M8 connector, 4-pin, PVC. Simple connection of sensors with M12 connectors to M8 connection technology possible										
Extension cables with M12 connector, 4-pin												
	K - DS M12A - M12A - 4P - 2m - PVC 50110126	2m extension cable, M12 axial socket, M12 axial connector, 4-pin, PVC										
	K - DS M12A - M12A - 4P - 5m - PVC 50110125	5m extension cable, M12 axial socket, M12 axial connector, 4-pin, PVC										
	<table border="1"> <tr><td>1</td><td>br/BN</td></tr> <tr><td>2</td><td>ws/WH</td></tr> <tr><td>3</td><td>bl/BU</td></tr> <tr><td>4</td><td>sw/BK</td></tr> <tr><td>5</td><td>Blindloch/ dummy hole</td></tr> </table>	1	br/BN	2	ws/WH	3	bl/BU	4	sw/BK	5	Blindloch/ dummy hole	K - DS M12A - M12A - 4P - 10m - PVC 50113265
1	br/BN											
2	ws/WH											
3	bl/BU											
4	sw/BK											
5	Blindloch/ dummy hole											
	K - DS M12A - M12A - 4P - 20m - PVC 50111729	10m extension cable, M12 axial socket, M12 axial connector, 4-pin, PVC										
		20m extension cable, M12 axial socket, M12 axial connector, 4-pin, PVC										

Ex
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ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cables ROD4 and ROD4plus		
	KB - ROD4PC - 3000 50038069	Connection cable between ROD 4 and PC 3000mm
	KB - ROD4PC - 10000 50038070	Connection cable between ROD 4 and PC 10000mm
	KB - ROD4 - CP - 5000 50108138	Connection cable 5000mm for ROD 4-3x, with configuration memory (Config-Plug)
	KB - ROD4 - CP - 10000 50108139	Connection cable 10000mm for ROD 4-3x, with configuration memory (Config-Plug)
	KB - ROD4 plus - 5000 50106881	Connection cable for ROD 4 plus 5000mm
	KB - ROD4 plus - 10000 50106906	Connection cable for ROD 4 plus 10000mm
	KB - ET - 2000 - SA - RJ45 50109880	Ethernet connection cable for ROD 4 plus 2000mm, M12 axial D-coded to RJ45
	KB - ET - 5000 - SA - RJ45 50109881	Ethernet connection cable for ROD 4 plus 5000mm, M12 axial D-coded to RJ45
	KB - ET - 10000 - SA - RJ45 50109882	Ethernet connection cable for ROD 4 plus 10000mm, M12 axial D-coded to RJ45


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ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connection cable for KONTURflex light curtains		
	CB - M12 - 1000S - 5GF/GM 678031	QUATTRO-KT/KR connection cable, length 1 m, shielded
	CB - M12 - 2500S - 5GF/GM 678033	QUATTRO-KT/KR connection cable, length 2.5 m, shielded
	CB - M12 - 5000S - 5GF/GM 678035	QUATTRO-KT/KR connection cable, length 5 m, shielded
	CB - M12 - 10000S - 5GF/GM 678040	QUATTRO-KT/KR connection cable, length 10 m, shielded
	CB - M12 - 15000S - 5GF/GM 678045	QUATTRO-KT/KR connection cable, length 15 m, shielded
	CB - M12 - 20000S - 5GF/GM 678032	QUATTRO-KT/KR connection cable, length 20 m, shielded

 Ex
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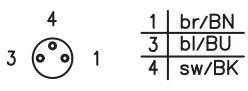
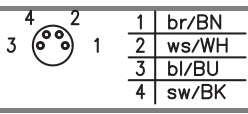
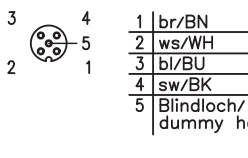
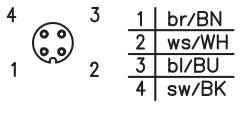
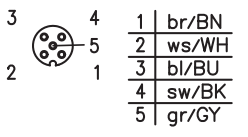
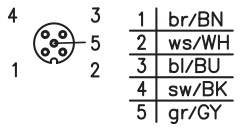
Services

 Optical Sensor
ABC

 Inductive Switch
ABC

 Fiber optic
ABC

ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
Connectors, user-configurable		
	D M8A - 3P - SK 50104582	Cable socket, M8 axial, 3-pin, insulation displacement connections, user-configurable
	D M8A - 4P - SK 50104583	Cable socket, M8 axial, 4-pin, insulation displacement connections, user-configurable
	KD 095 - 4 50031324	Cable socket, M12 angular, 4-pin, user-configurable
	KD 095 - 4A 50031323	Cable socket, M12 axial, 4-pin, user-configurable
	KS 095 - 4A 50040155	Cable plug, M12 axial, 4-pin, user-configurable
	KD 095 - 5 50020502	Cable socket, M12 angular, 5-pin, user-configurable
	KD 095 - 5A 50020501	Cable socket, M12 axial, 5-pin, user-configurable
	KD 095 - 5A - PG9 50081461	Cable socket, M12 axial, 5-pin, user-configurable, with PG9 screwed cable gland
	KS 095 - 5A 50114223	Cable plug, M12 axial, 5-pin, user-configurable
	KD - ROD4 - X1 - Set 50038072	Connector X1 for ROD 4, 15-pin
	KD - ROD4 - X2 - Set 50038073	Connector X2 for ROD 4, 9-pin
	D - ET1 50108991	RJ45 plug for user-configuration

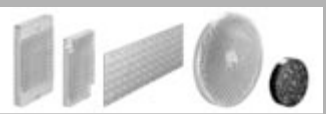
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ACCESSORIES / CONNECTION TECHNOLOGY

Contact assignment	Part description Part No.:	Feature
RS 232 connection cables for connecting to MA 2xx fieldbus gateways		
	K-DS M12A-MA-5P-3m-S-PUR 50115049	Interface cable for connection of ODS.../D26... optical distance sensors with RS 232 interface to the MA 2xx <i>i</i> connector units
	K-DS M12A-MA-8P-3m-S-PUR 50115050	Interface cable for connection of ODSL 30/D232... optical distance sensors with RS 232 interface to the MA 2xx <i>i</i> connector units
	K-DS M12A-MA-5P-3m-1S-PUR 50116791	Interface cable for connection of the KONTURflex QUATTRO-RSX/M12 control device with RS 232 interface to the MA 2xx <i>i</i> connector units
Connector units for connecting RS 232 to fieldbus		
  <p>Detailed information in the Identification systems / Data transmission systems / Distance measuring system catalog or at www.leuze.com</p>	MA 204i 50112893	Modular connector unit for connecting devices with RS 232 interfaces to PROFIBUS
	MA 208i 50112892	Modular connector unit for connecting devices with RS 232 interfaces to Ethernet TCP/IP
	MA 235i 50114154	Modular connector unit for connecting devices with RS 232 interfaces to CANopen
	MA 238i 50114155	Modular connector unit for connecting devices with RS 232 interfaces to EtherCAT
	MA 248i 50112891	Modular connector unit for connecting devices with RS 232 interfaces to PROFINET-IO (RT)
	MA 255i 50114156	Modular connector unit for connecting devices with RS 232 interfaces to DeviceNet
	MA 258i 50114157	Modular connector unit for connecting devices with RS 232 interfaces to EtherNet/IP

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Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors, rectangular, screw type and adhesive types		
	TKS 10 x 32 50110282	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 20 x 20 50117584	Screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 20 x 40 50081283	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 30 x 45 50114617	Screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 30 x 50 50023525	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 30 x 60 50030433	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 40 x 60 50040820	Screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C

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Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors, rectangular, screw type and adhesive types		
	TKS 50 x 50 50022814	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 50 x 50.1 50105153	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 50 x 100 50022815	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 85 x 85 50116725	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 100 x 100 50022816	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 30 x 500 50027097	Can be screwed on, sawed due to metal coating, reduced reflection range due to coating Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C

ACCESSORIES / REFLECTORS

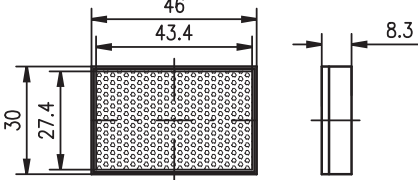
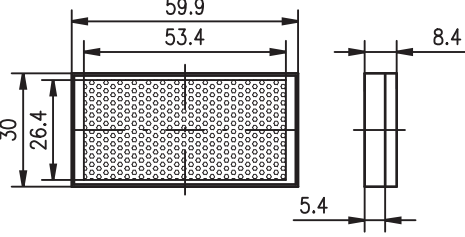
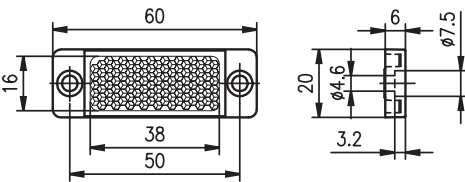
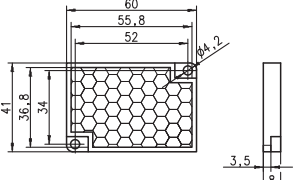
Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors, rectangular, adhesive		
	TK 30 x 50 50003189	Adhesive Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 20 x 75 50003188	Adhesive Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 50 x 100 50003191	Adhesive, screw type with BT 910M Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 100 x 100 50003192	Adhesive, screw type with BT 910M Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 40 x 180 50003190	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C

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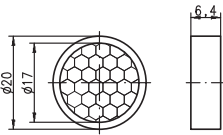
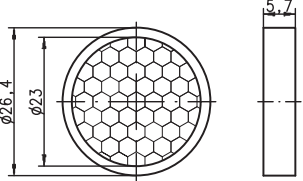
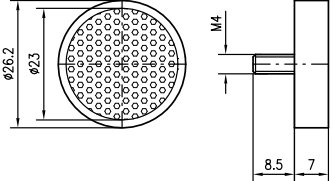
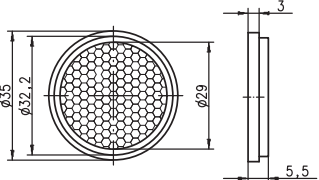
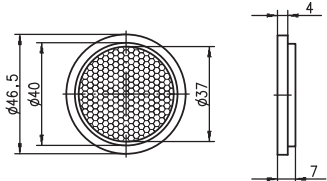
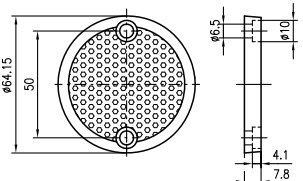
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Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors, rectangular, self-adhesive		
	<p>TKA 30 x 46 50108216</p>	<p>Self-adhesive</p> <p>Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C</p>
	<p>TKA 30 x 60 50108215</p>	<p>Self-adhesive</p> <p>Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C</p>
Plastic reflectors, rectangular, for use in the pharmaceutical industry		
	<p>TKS 20 x 40.P 50106960</p>	<p>Screw type, resistant to cleaning with alcohol and hydrogen peroxide</p> <p>Protection class IP 67 Temperature range -40°C ... +70°C</p>
	<p>TKS 40 x 60.P 50106957</p>	<p>Screw type, resistant to cleaning with alcohol and hydrogen peroxide</p> <p>Protection class IP 67 Temperature range -40°C ... +70°C</p>

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Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors, round		
	TK 20.1 ¹⁾ 50041471	Adhesive Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 25.1 ¹⁾ 50041355	Adhesive Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TKS 25 ¹⁾ 50027696	Screw type, threaded bolt Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 35.1 ¹⁾ 50101867	Adhesive Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 45.1 ¹⁾ 50105990	Adhesive Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	TK 60 ¹⁾ 50003186	Adhesive, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C

1) Dimensional tolerance for all specified dimensions: ± 0.2mm

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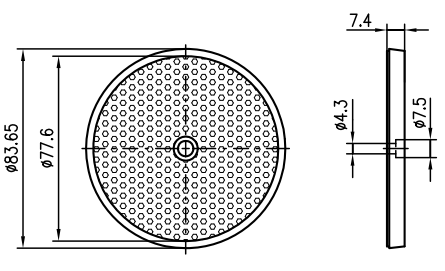
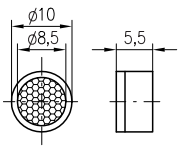
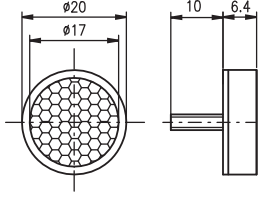
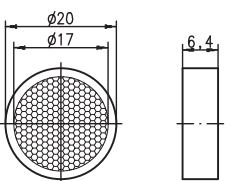
Accessories

Services

Optical Sensor ABC

Inductive Switch ABC

Fiber optic ABC

Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors		
	<p>TK 82.2 50024127</p>	<p>Screw type, flat surface, (dimensional tolerance for all specified dimensions: ± 0.2 mm)</p> <p>Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C</p>
Plastic reflectors, round, for use in the pharmaceutical industry		
	<p>TK 10.P 50116939</p>	<p>Adhesive, resistant to cleaning with alcohol and hydrogen peroxide</p> <p>Protection class IP 67 Temperature range -40°C ... +70°C</p>
	<p>TKS 20.P 50106958</p>	<p>Screw type, resistant to cleaning with alcohol and hydrogen peroxide</p> <p>Protection class IP 67 Temperature range -40°C ... +70°C</p>
Plastic reflectors with micro triple structure, round		
	<p>MTK 20 50109828</p>	<p>Micro triple, adhesive</p> <p>Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C</p>

ACCESSORIES / REFLECTORS

Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors with micro triple structure, rectangular		
	MTKS 14 x 23 50106209	Micro triple, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	MTKS 20 x 20 50040895	Micro triple, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	MTKS 20 x 30 50040894	Micro triple, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	MTKS 20 x 40.1 50104130	Micro triple, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	MTKS 30 x 50.1 50104132	Micro triple, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	MTKS 40 x 60.1 50104131	Micro triple, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C
	MTKS 50 x 50.1 50117583	Micro triple, screw type Plastic PMMA 8N, protection class IP 67 Temperature range -40°C ... +70°C

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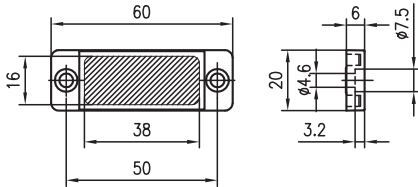
Fiber optic
ABC

Dimensioned drawing

Part description
Part No.:

Feature

Plastic reflectors with micro triple structure, rectangular

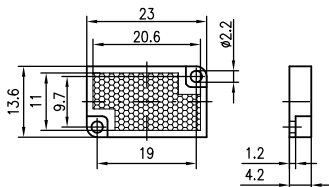


REF 6 - S - 20 x 40
50114185

Reflector with maximum homogeneity based on reflective tape no. 6

Screw type, protection class IP 67
Temperature range -40°C ... +70°C

Plastic reflectors with micro triple structure, for use in the pharmaceutical industry



MTKS 14 x 23.P
50106961

Micro triple, screw type resistant to cleaning with alcohol and hydrogen peroxide

Protection class IP 67
Temperature range -40°C ... +70°C

ACCESSORIES / REFLECTORS

Dimensioned drawing	Part description Part No.:	Feature
Heatable plastic reflectors		
	HTK 82 50000068	Screw type, 230VAC, cable length 2 m, Cable cross-section 2x0.75 mm ²
		Power consumption 3.4W Temperature range -40 °C ... +70 °C
	HTK 82 - 24V 50000071	Screw type, 24VAC/DC, cable length 2 m, cable cross-section 2x0.75 mm ²
		Power consumption 2.8W Temperature range -40 °C ... +70 °C
High-temperature reflector		
	TKS 50 x 50.1.HT 50113309	High-temperature reflector, plastic, protection class IP 40, temperature range -40 °C ... +120 °C
		IP 69K

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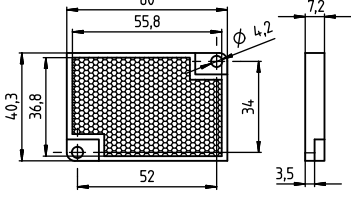
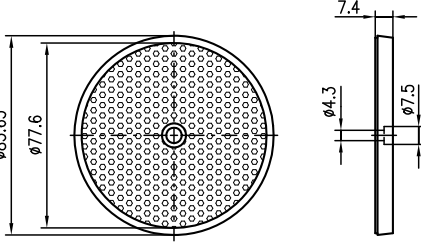
Accessories

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Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
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Dimensioned drawing	Part description Part No.:	Feature
Plastic reflectors with anti-fogging coating		
	<p>TKS 40 x 60.1.AF 50120538</p>	<p>Adhesive, can be screwed on, with anti-fogging coating</p> <p>Plastic PMMA 8N, protection class IP 67 Temperature range -40 °C ... +70 °C</p> <p>Coating is effective at temperatures > 0 °C!</p>
	<p>TK 82.AF 50111375</p>	<p>Screw type, flat surface, with anti-fogging coating (dimensional tolerance for all specified dimensions: ± 0.2 mm)</p> <p>Plastic PMMA 8N, protection class IP 67 Temperature range -40 °C ... +70 °C</p> <p>Coating is effective at temperatures > 0 °C!</p>

ACCESSORIES / REFLECTORS

Dimensioned drawing	Part description Part No.:	Feature
Special reflector for use in food + beverage sector		
	TK BR 53 50112142	Special reflector in the housing of the 53 series, A = permissible clamping range Protection class IP 67, IP 69K Temperature range -30°C ... +70°C
Glass reflectors, round		
	TG 6 50003176	Adhesive, pressable Temperature range -20°C ... +120°C
	TG 15 50003177	Threaded bolt Temperature range -20°C ... +120°C
	TG 29 50009374	Threaded bolt Temperature range -20°C ... +120°C
	TG 60 50003179	Threaded bolt Temperature range -20°C ... +120°C

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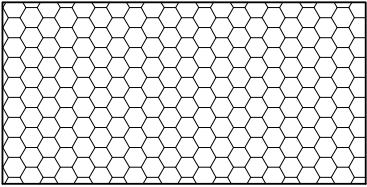
Accessories

Services

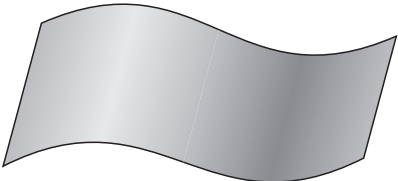
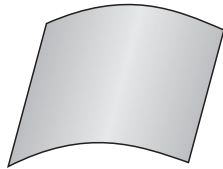
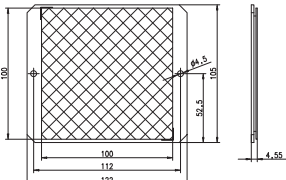
Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

Dimensioned drawing	Part description Part No.:	Feature
Reflective tape no. 4, self-adhesive, direction-independent adhesive mounting		
	Refl. tape No. 4 / 20 x 20 mm 50107057	For polarized retro-reflective sensors, temperature range -40°C ... +80°C
	Refl. tape No. 4 / 25 x 1000 mm 50102604	For polarized retro-reflective sensors, temperature range -40°C ... +80°C
	Refl. tape No. 4 / 50 x 50 mm 50108300	For polarized retro-reflective sensors, temperature range -40°C ... +80°C
	Refl. tape No. 4 / 50 x 1000 mm 50038060	For polarized retro-reflective sensors, temperature range -40°C ... +80°C
	Refl. tape No. 4 / 100 x 100mm 50106119	For polarized retro-reflective sensors, temperature range -40°C ... +80°C
	Refl. tape No. 4 / 920 x 749mm 50038117	For polarized retro-reflective sensors, temperature range -40°C ... +80°C
	Refl. tape No. 4 / 25mm roll 50041876	For polarized retro-reflective sensors, width 25mm, length 22.8m, temperature range -40°C ... +80°C
	REF 4 - A - 50 x 45700 50111772	For polarized retro-reflective sensors, width 50mm, length 45.7m, temperature range -40°C ... +80°C
Refl. tape No. 4 / 100mm roll 50104657	For polarized retro-reflective sensors, width 100mm, length 45.7m, temperature range -40°C ... +80°C	

ACCESSORIES / REFLECTORS

Dimensioned drawing	Part description Part No.:	Feature
Reflective tape no. 6, self-adhesive, maximum return-beam power and homogeneity, adhesive mounting is <u>not</u> direction-independent (side edge of sensor must be aligned parallel to foil edge)		
	Refl. tape No. 6 / 25 x 25 mm 50110191	For polarized retro-reflective sensors, PMMA, temperature range -40°C ... +70°C
	Refl. tape No. 6 / 50 x 50 mm 50110192	For polarized retro-reflective sensors, PMMA, temperature range -40°C ... +70°C
	REF 6-A-77x77 50111829	For polarized retro-reflective sensors, PMMA temperature range -40°C ... +70°C
Cooperative targets, self-adhesive, direction-independent adhesive mounting, for ODKL 96B distance sensors and HRTL 96B light scanners		
	REF 7 - A - 100 x 100 50111527	For ODKL 96B distance sensors and HRTL 96B light scanners
		Width 100mm, length 100mm temperature range -40°C ... +70°C
Cooperative Targets for Optical Laser Distance Sensors ODSL 30		
	CTS 100 x 100 50104599	Screw type, diffuse target reflection approx. 90%, ceramics on galvanized sheet steel, for ODSL 30 measurement modes with object luminosity coefficient of 50% ... 90%

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Connection technology
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Reflectors
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ACCESSORIES / REFLECTORS

Dimensioned drawing	Part description Part No.:	Feature
Mounting systems for reflectors		
	BTU 934M - D10 - 90 50120011	Reflector for rod \varnothing 10 mm or cheek 1.5 ... 4 mm, with reflector TKA 30x46 (see p.665)
	BTU 934M - D12 - 90 50120019	Reflector for rod \varnothing 12 mm or cheek 1.5 ... 4 mm, with reflector TKA 30x46 (see p.665)
	BTU 934M - D14 - 90 50120010	Reflector for rod \varnothing 14 mm or cheek 1.5 ... 4 mm, with reflector TKA 30x46 (see p.665)
	UMS 96 - 82 50027191	Reflector for rod \varnothing 10 ... 16 mm, with reflector TK 82
	BTU 900M - D10 50119332	Reflector mounting bracket for rod \varnothing 10 mm or cheek 1.5 ... 4 mm, for reflectors (M)TKS 30x50, (M)TKS 40x60, TKS 50x50
	BTU 900M - D12 50119331	Reflector mounting bracket for rod \varnothing 12 mm or cheek 1.5 ... 4 mm, for reflectors (M)TKS 30x50, (M)TKS 40x60, TKS 50x50
	BTU 900M - D14 50119330	Reflector mounting bracket for rod \varnothing 14 mm or cheek 1.5 ... 4 mm, for reflectors (M)TKS 30x50, (M)TKS 40x60, TKS 50x50
	BT 46 50105315	Mounting bracket for 46 series and reflectors MTKS 20x20, (M)TKS 30x50, TKS 30x60, (M)TKS 40x60, (M)TKS 50x50, TK 82.2
	BT 910M 50009419	Mounting bracket for TK 100x100 reflectors

Ex
Sensors

AS-interface
Sensors

Accessories

Services

Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

REFLECTOR SELECTION

2 SERIES

Retro-reflective sensor Type	with reflector	Operating range [m] Typ. op. range limit [m]						
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TKS 40 x 60	MTKS 20 x 40.1	TKS 20 x 40	MTKS 20 x 30	Tape 4 50 x 50
PRK 2 / 42 ...		0.07 ... 3.5 0.07 ... 4.0		0.07 ... 2.5 0.07 ... 2.9		0.02 ... 1.3 0.02 ... 1.5		0.12 ... 0.9 0.12 ... 1.1

REFLECTOR SELECTION

3B SERIES

Retro-reflective sensor Type	with reflector	Operating range [m] Typ. op. range limit [m]						
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TKS 40 x 60	MTKS 20 x 40.1	TKS 20 x 40	MTKS 20 x 30	Tape 4 50 x 50
RKR 3B / 6.42 ...		0.0 ... 1.5 0.0 ... 1.8	0.0 ... 1.0 0.0 ... 1.2	0.0 ... 1.0 0.0 ... 1.2		0.0 ... 0.5 0.0 ... 0.6		
PRK 3B / 6.7 ... PRK 3B / 66 ...		0.02 ... 5.0 0.02 ... 6.0		0.02 ... 3.0 0.02 ... 3.6		0.02 ... 1.5 0.02 ... 2.0		0.1 ... 1.2 0.1 ... 1.6
PRK 3B / 6.22 ...		0.0 ... 4.0 0.0 ... 5.0		0.0 ... 3.0 0.0 ... 3.6		0.0 ... 1.3 0.0 ... 1.5		0.0 ... 0.7 0.0 ... 1.0
PRKL 3B / 6.22 ...			0.0 ... 2.0 0.0 ... 3.0		0.0 ... 1.0 0.0 ... 1.5		0.0 ... 1.6 0.0 ... 2.2	



REFLECTOR SELECTION

5 SERIES

Retro-reflective sensor	with reflector	Operating range [m]					
		TK 100 x 100 TKS 100 x 100	TKS 40 x 60	TKS 82.2	TKS 30 x 50	TKS 20 x 40	Tape 4 50 x 50
Type		Typ. op. range limit [m]					
PRK 5 / ...		0.02 ... 4.5 0.02 ... 6.0	0.02 ... 3.0 0.02 ... 4.0	0.05 ... 3.6 0.05 ... 4.5	0.03 ... 1.9 0.03 ... 2.5	0.04 ... 1.6 0.04 ... 2.2	0.08 ... 1.4 0.08 ... 2.0

REFLECTOR SELECTION

8 SERIES

Retro-reflective sensor	with reflector	Operating range [m]				
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 100 x 100
Type		Typ. op. range limit [m]				
PRK 8 / 44 ... PRK 8 / 66 ...		0.10 ... 6.4 0.05 ... 8.0	0.12 ... 4.8 0.12 ... 6.0	0.10 ... 2.8 0.10 ... 3.5	0.13 ... 2.4 0.13 ... 3.0	0.15 ... 2.8 0.15 ... 3.5
PRK 8 / 66.11 - S12		0.0 ... 5.0 0.0 ... 7.0	0.0 ... 3.5 0.0 ... 4.5	0.0 ... 2.0 0.0 ... 2.4	0.0 ... 1.5 0.0 ... 2.0	0.0 ... 1.0 0.0 ... 1.3
PRK 8 / 66.41 - S12 PRK 8 / 66.42 - S12		0.0 ... 2.0 0.0 ... 2.4	0.0 ... 1.5 0.0 ... 1.8	0.0 ... 0.6 0.0 ... 0.8	0.0 ... 0.6 0.0 ... 0.8	0.0 ... 0.3 0.0 ... 0.5



Additional reflectors and the dimensioned drawings for the reflectors can be found from page 662 onwards.

REFLECTOR SELECTION

18 SERIES

Retro-reflective sensor Type	with reflector	Operating range [m] Typ. op. range limit [m]					
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 100 x 100	Tape 6 50 x 50
RK(R) 18 / 4 DL ... PRK 18 / 4 DL.4 PRK 18 / 2 DL.4		0.0 ... 2.4 0.0 ... 3.0	0.0 ... 2.0 0.0 ... 2.5	0.0 ... 0.8 0.0 ... 1.0	0.0 ... 0.8 0.0 ... 1.0	0.0 ... 0.4 0.0 ... 0.6	
PRK 18 / 24 DL ... IPRK 18 / 4 DL ...		0.0 ... 3.0 0.0 ... 4.0	0.0 ... 2.4 0.0 ... 3.0	0.0 ... 1.6 0.0 ... 2.0	0.0 ... 1.4 0.0 ... 1.8	0.0 ... 0.6 0.0 ... 0.8	
IPRK 18 / V ...			0.0 ... 1.0 0.0 ... 1.2				0.0 ... 1.0 0.0 ... 1.2



Additional reflectors and the dimensioned drawings for the reflectors can be found from page 662 onwards.



REFLECTOR SELECTION

25B SERIES

Retro-reflective sensor	with reflector	Operating range [m]					
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TKS 40 x 60	TKS 20 x 40	MTKS 20 x 20	Tape 4 50 x 50
Type		Typ. op. range limit [m]					
(I)PRK 25B / 4 ... PRK 25B / 66 ...		0.05 ... 8.0 0.05 ... 10.0		0.05 ... 4.0 0.05 ... 5.0	0.05 ... 2.5 0.05 ... 3.0		0.05 ... 3.0 0.05 ... 3.5
PRK 25B / ...3 ...		0.05 ... 6.0 0.02 ... 8.0		0.05 ... 3.0 0.02 ... 4.0	0.05 ... 2.0 0.02 ... 3.0		0.15 ... 2.0 0.15 ... 2.1
PRKL 25B / ...		0.3 ... 12.0 0.3 ... 15.0	0.05 ... 12.0 0.05 ... 15.0			0.05 ... 6.0 0.05 ... 7.0	0.1 ... 1.7 0.1 ... 1.9

REFLECTOR SELECTION

28 SERIES

Retro-reflective sensor	with reflector	Operating range [m]					
		TK 100 x 100 TKS 100 x 100	TKS 40 x 60	TKS 82.2	TKS 30 x 50	TKS 20 x 40	Tape 4 50 x 50
Type		Typ. op. range limit [m]					
PRK 28 / ...		0.02 ... 4.5 0.02 ... 6.0	0.02 ... 3.0 0.02 ... 4.0	0.05 ... 3.6 0.05 ... 4.5	0.03 ... 1.9 0.03 ... 2.5	0.04 ... 1.6 0.04 ... 2.2	0.08 ... 1.4 0.08 ... 2.0

Ex Sensors

AS-interface
Sensors

Accessories

Services

Optical Sensor
ABCInductive Switch
ABCFiber optic
ABC

REFLECTOR SELECTION

46B SERIES

Retro-reflective sensor		Operating range [m]					
		Typ. op. range limit [m]					
Type	with reflector	TK 100 x 100 TKS 100 x 100	TKS 50 x 50	TKS 40 x 60	TKS 30 x 50	TKS 20 x 40	Tape 4 50 x 50
IPRK 46B / 4 - S12 PRK 46B / 44 - S12 PRK 46B / 6, 200 - S12 PRK 46B / 66 - S12 PRK 46B / 66.01 - S12 PRK 46B / 66, 200 - S12 PRK 46B / 7D - S12		0.05 ... 15.0 0.05 ... 18.0	0.05 ... 10.0 0.05 ... 12.0	0.05 ... 8.0 0.05 ... 10.0	0.05 ... 5.0 0.05 ... 6.0	0.05 ... 3.0 0.05 ... 5.0	0.2 ... 2.0 0.2 ... 3.0
PRK 46B / 4.82 - S12 PRK 46B / 4D.2 - S12 IPRK 46B / 4.2 - S12 PRK 46B / 44.2 - S12 PRK 46B / 6.2 - S12 PRK 46B / 66.2 - S12 PRK 46B / 66.2, 200 - S12		0.1 ... 8.0 0.1 ... 10.0	0.1 ... 5.0 0.1 ... 6.0	0.1 ... 4.0 0.1 ... 5.0	0.1 ... 2.5 0.1 ... 3.0	0.1 ... 2.0 0.1 ... 3.0	0.3 ... 1.0 0.3 ... 1.5

REFLECTOR SELECTION

53 SERIES

Retro-reflective sensor		Operating range [m]					
		Typ. op. range limit [m]					
Type	with reflector	TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TKS 40 x 60	MTKS 20 x 40.1	TKS 20 x 40	Tape 4 50 x 50
RKR 53 / 6.42 ...		0.0 ... 1.5 0.0 ... 1.8	0.0 ... 1.0 0.0 ... 1.2	0.0 ... 1.0 0.0 ... 1.2		0.0 ... 0.5 0.0 ... 0.6	
PRK 53 / 6.22 ...		0.0 ... 4.0 0.0 ... 5.0		0.0 ... 2.6 0.0 ... 3.2		0.0 ... 1.3 0.0 ... 1.5	0.0 ... 0.7 0.0 ... 1.0
PRKL 53 / 6.22 ...			0.0 ... 2.0 0.0 ... 3.0		0.0 ... 1.0 0.0 ... 1.5		

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Reflectors
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REFLECTOR SELECTION

55 SERIES

Retro-reflective sensor	with reflector	Operating range [m]					
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TKS 40 x 60	MTKS 20 x 40.1	TKS 20 x 40	Tape 4 50 x 50
Type							
RKR 55 / 6.42 ...		0.0 ... 1.5 0.0 ... 1.8	0.0 ... 1.0 0.0 ... 1.2	0.0 ... 1.0 0.0 ... 1.2		0.0 ... 0.5 0.0 ... 0.6	
PRK 55 / 66 ...		0.02 ... 5.0 0.02 ... 6.0		0.02 ... 3.0 0.02 ... 3.6		0.02 ... 1.5 0.02 ... 2.0	0.1 ... 1.2 0.1 ... 1.6
PRK 55 / 6.22 ...		0.0 ... 4.0 0.0 ... 5.0		0.0 ... 2.6 0.0 ... 3.2		0.0 ... 1.3 0.0 ... 1.5	0.0 ... 0.7 0.0 ... 1.0
PRKL 55 / 6.22 ...			0.0 ... 2.0 0.0 ... 3.0		0.0 ... 1.0 0.0 ... 1.5		

REFLECTOR SELECTION

95 SERIES

Retro-reflective sensor	with reflector	Operating range [m]					
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 100 x 100	Tape 4 10 x 10
Type							
PRK 95 / 44 L IPRK 95 / 44 L.5		0.2 ... 6.0 0.2 ... 9.0	0.2 ... 4.2 0.2 ... 7.1	0.2 ... 2.5 0.2 ... 4.1	0.2 ... 1.9 0.2 ... 3.2	0.2 ... 2.4 0.2 ... 4.0	
IPRK 95 / 4.8 L.2 IPRK 95 / 44 L.2 ...		0.0 ... 4.2 0.0 ... 6.0	0.0 ... 3.2 0.0 ... 5.4	0.0 ... 1.8 0.0 ... 3.0	0.0 ... 1.7 0.0 ... 2.9	0.0 ... 1.2 0.0 ... 1.7	
PRK 95 / 22 L.4 PRK 95 / 44 L.4		0.0 ... 1.8 0.0 ... 3.0	0.0 ... 1.8 0.0 ... 3.0	0.0 ... 1.1 0.0 ... 1.8	0.0 ... 1.0 0.0 ... 1.7	0.0 ... 0.4 0.0 ... 0.7	
IPRK 95 / 44 L.3		0.0 ... 2.2 0.0 ... 3.7	0.0 ... 1.7 0.0 ... 2.9	0.0 ... 1.0 0.0 ... 1.7	0.0 ... 0.8 0.0 ... 1.6	0.0 ... 0.6 0.0 ... 1.0	0.0 ... 0.3 0.0 ... 0.3



Additional reflectors and the dimensioned drawings for the reflectors can be found from page 662 onwards.

REFLECTOR SELECTION

96 SERIES / DC

Retro-reflective sensor	with reflector	Operating range [m]					Tape 4 100 x 100
		TK 100 x 100 TKS 100 x 100	TK 82	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	
Type				Typ. op. range limit [m]			
RK 96 M/P - 1440 - 21		0.3 ... 15.0 0.1 ... 18.0	0.3 ... 11.0 0.1 ... 12.0	0.3 ... 11.0 0.1 ... 12.0	0.3 ... 6.0 0.1 ... 7.1	0.3 ... 5.0 0.1 ... 6.0	0.3 ... 6.0 0.1 ... 8.0
PRK 96 M/P - 3380 - 41 PRK 96 M/P - 3360 - 21 PRK 96 M/N - 3366 - 27		0.3 ... 15.0 0.1 ... 18.0	0.3 ... 11.0 0.1 ... 11.5	0.3 ... 11.0 0.1 ... 12.0	0.3 ... 6.0 0.1 ... 7.5	0.3 ... 5.0 0.1 ... 6.0	0.3 ... 6.0 0.1 ... 7.5
PRK 96 M/P - 1361 - 47 PRK 96 M/P - 1362 - 47 PRK 96 M/P - 1370 - 22 PRK 96 M/P - 1370 - 42 PRK 96 M/P - 1400 - 22 PRK 96 M/P - 1400 - 42 PRK 96 K/P - 1360 - 41 PRK 96 K/P - 1360.1 - 41 PRK 96 K/P - 1365 - 45 PRK 96 K/P - 1380 - 41 PRK 96 K/P - 1360 - 21 PRK 96 K/P - 1361 - 29 PRK 96 K/P - 1363 - 29 PRK 96 K/N - 1380 - 46		0.3 ... 8.0 0.1 ... 10.0	0.3 ... 6.0 0.1 ... 7.5	0.3 ... 7.0 0.1 ... 8.5	0.3 ... 4.5 0.1 ... 5.0	0.3 ... 3.0 0.1 ... 4.0	0.3 ... 4.0 0.1 ... 5.5
PRK 96 M/P - 1838 - 21 PRK 96 M/P - 1838 - 41 PRK 96 M/P - 2838 - 28		0.0 ... 7.0 0.0 ... 8.5	0.0 ... 5.0 0.0 ... 6.0	0.0 ... 6.0 0.0 ... 7.5	0.0 ... 4.0 0.0 ... 5.0	0.0 ... 3.5 0.0 ... 4.0	0.0 ... 3.0 0.0 ... 3.5
PRK 96 K/P - 3368 - 41		0.3 ... 26.0 0.1 ... 28.0	0.3 ... 19.0 0.1 ... 21.0	0.3 ... 18.0 0.1 ... 19.0	0.3 ... 10.0 0.1 ... 12.0	0.3 ... 6.0 0.1 ... 8.0	0.3 ... 6.5 0.1 ... 7.0
PRK 96 M/P - 1830 - 21 PRK 96 M/P - 1830 - 41		0.0 ... 1.5 0.0 ... 1.85		TK(S) 50 x 50: 0.0 ... 1.5 0.0 ... 1.85	0.0 ... 1.5 0.0 ... 1.85		

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REFLECTOR SELECTION

96 SERIES / AC-DC

Retro-reflective sensor Type	with reflector	Operating range [m] Typ. op. range limit [m]					
		TK 100 x 100 TKS 100 x 100	TK 82	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 100 x 100
RK 96 K/R - 1560 - 25		0.3 ... 15.0 0.1 ... 18.0	0.3 ... 11.0 0.1 ... 12.0	0.3 ... 11.0 0.1 ... 12.0	0.3 ... 6.0 0.1 ... 7.1	0.3 ... 5.0 0.1 ... 6.0	0.3 ... 6.0 0.1 ... 8.0
PRK 96 M/R - 3420 - 25 PRK 96 M/R - 3430 - 25		0.3 ... 15.0 0.1 ... 18.0	0.3 ... 11.0 0.1 ... 11.5	0.3 ... 11.0 0.1 ... 12.0	0.3 ... 6.0 0.1 ... 7.5	0.3 ... 5.0 0.1 ... 6.0	0.3 ... 6.0 0.1 ... 7.5
PRK 96 M/R - 1858 - 25		0.0 ... 7.0 0.0 ... 8.5	0.0 ... 5.0 0.0 ... 6.0	0.0 ... 6.0 0.0 ... 7.5	0.0 ... 4.0 0.0 ... 5.0	0.0 ... 3.5 0.0 ... 4.0	0.0 ... 3.0 0.0 ... 3.5
PRK 96 M/R - 1850 - 25		0.0 ... 1.5 0.0 ... 1.85		TK(S) 50 x 50: 0.0 ... 1.5 0.0 ... 1.85	0.0 ... 1.5 0.0 ... 1.85		
PRK 96 K/R - 3428 - 25		0.3 ... 20.0 0.1 ... 24.0	0.3 ... 15.0 0.1 ... 17.0	0.3 ... 15.0 0.1 ... 16.0	0.3 ... 10.0 0.1 ... 12.0	0.3 ... 8.0 0.1 ... 9.0	0.3 ... 10.0 0.1 ... 12.0
PRK 96 K/R - 1420 - 25 PRK 96 K/R - 1430 - 25		0.3 ... 8.0 0.1 ... 10.0	0.3 ... 6.0 0.1 ... 7.5	0.3 ... 7.0 0.1 ... 8.5	0.3 ... 4.5 0.1 ... 5.0	0.3 ... 3.0 0.1 ... 4.0	0.3 ... 4.0 0.1 ... 5.5



Additional reflectors and the dimensioned drawings for the reflectors can be found from page 662 onwards.

REFLECTOR SELECTION

318 SERIES

Retro-reflective sensor	with reflector	Operating range [m]				
		Typ. op. range limit [m]				
Type		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 100 x 100
RK 318 M/... - S12 RK 318 M/... RK 318 K/... - S12 RK 318 K/...		0.03 ... 4.6 0.03 ... 6.0	0.02 ... 4.0 0.02 ... 5.4	0.03 ... 2.2 0.03 ... 3.2	0.06 ... 1.9 0.06 ... 2.9	0.15 ... 2.5 0.15 ... 3.5
RK 318 WM/... - S12 RK 318 WM/... RK 318 WK/... - S12 RK 318 WK/...		0.05 ... 3.7 0.05 ... 4.8	0.05 ... 3.2 0.05 ... 4.3	0.05 ... 1.8 0.05 ... 2.6	0.24 ... 1.5 0.24 ... 2.3	0.36 ... 2.0 0.36 ... 2.8
PRK 318 M/... - S12 PRK 318 M/... PRK 318 K/... - S12 PRK 318 K/...		0.03 ... 4.6 0.03 ... 6.0	0.02 ... 3.2 0.02 ... 4.6	0.03 ... 2.2 0.03 ... 3.2	0.06 ... 1.9 0.06 ... 2.9	0.24 ... 2.0 0.24 ... 3.1

REFLECTOR SELECTION

318B SERIES

Retro-reflective sensor	with reflector	Operating range [m]					
		Typ. op. range limit [m]					
Type		TK 100 x 100 TKS 100 x 100	TKS 40 x 60	TK 82.2	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 50 x 50
PRK 318B / ...		0.02 ... 4.5 0.02 ... 6.0	0.02 ... 3.0 0.02 ... 4.0	0.05 ... 3.6 0.05 ... 4.5	0.03 ... 1.9 0.03 ... 2.5	0.04 ... 1.6 0.04 ... 2.2	0.08 ... 1.4 0.08 ... 2.0
PRK 318B.W / ...		0.02 ... 4.0 0.02 ... 5.0	0.02 ... 2.6 0.02 ... 3.5	0.05 ... 3.3 0.05 ... 4.0	0.05 ... 1.6 0.05 ... 2.0	0.04 ... 1.5 0.04 ... 2.0	0.10 ... 1.3 0.10 ... 1.8

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REFLECTOR SELECTION

412 SERIES

Retro-reflective sensor Type	with reflector	Operating range [m] Typ. op. range limit [m]				
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 100 x 100
PRK 412 M/P - S12		0.15 ... 1.3	0.15 ... 0.8	0.15 ... 0.6	0.15 ... 0.5	0.15 ... 0.5
PRK 412 M/P		0.05 ... 1.6	0.05 ... 1.1	0.05 ... 0.8	0.05 ... 0.6	0.05 ... 0.6

REFLECTOR SELECTION

618 SERIES

Retro-reflective sensor Type	with reflector	Operating range [m] Typ. op. range limit [m]				
		TK 100 x 100 TKS 100 x 100	MTKS 50 x 50.1	TK 30 x 50 TKS 30 x 50	TKS 20 x 40	Tape 4 100 x 100
PRK 618 / 4 - S12		0.0 ... 5.0 0.0 ... 7.0	0.0 ... 2.3 0.0 ... 3.3	0.03 ... 2.1 0.03 ... 3.0	0.0 ... 1.7 0.0 ... 2.4	0.05 ... 2.0 0.05 ... 2.8



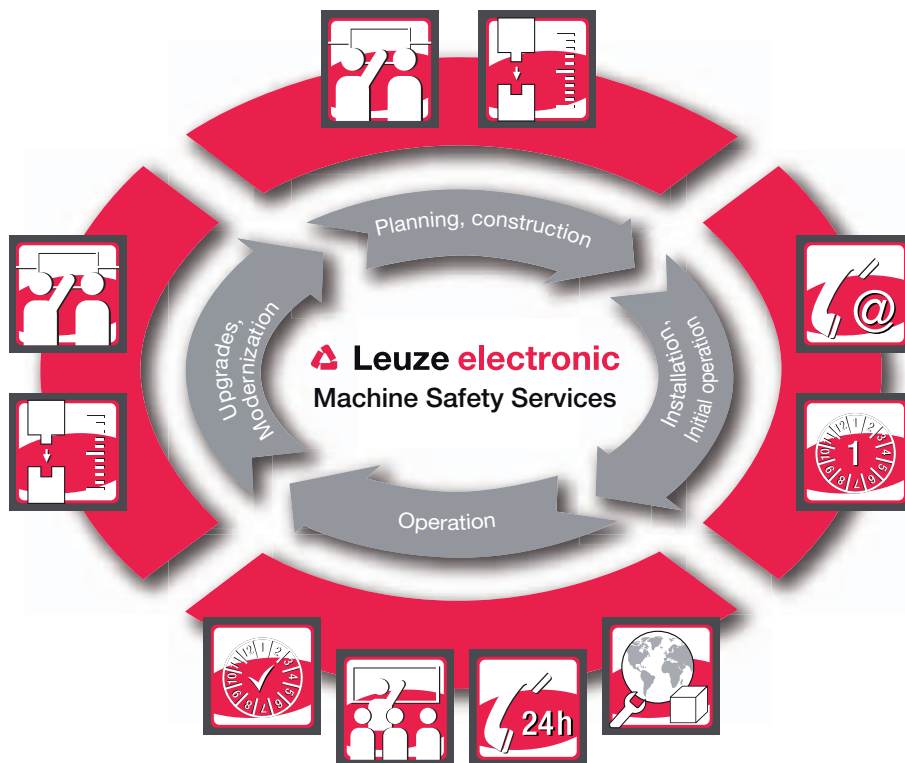
Additional reflectors and the dimensioned drawings for the reflectors can be found from page 662 onwards.

SERVICES

Overview

Our services – Your benefits, at a glance

Whether it's planning, engineering, commissioning or repair, the use of complex industrial automation technology requires a keen intellectual grasp and well-established expertise.



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Services
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Part description Part no.	Feature
Services on-site in Germany and abroad	
LOS daily rate S50000100	includes up to 10 hours, plus expenses/travel costs
LOS labor per hour S50000101	
LOS travel time per hour S50000102	
LOS price per km for travel by car S50000103	plus toll charges, vignettes, etc.
LOS flight costs S50000104	invoicing according to expenditure
LOS accommodation expenses S50000105	invoicing according to expenditure



Service calls on Saturdays, Sundays and holidays will incur a surcharge of a factor of 1.5.

Service work, such as fault analysis, fault rectification, installation and fine adjustment, test installations etc. are invoiced on a time and material cost basis.

Software adjustments, creation of customer-specific software, log adjustments etc. are calculated according to time and effort. Prices on request.

Optical Sensor ABC



Introduction

The optical sensor ABC shall assist you in selecting the right sensor.















You will find here explanations on the different optical sensor types, the additional functions and a lot of information for the practitioner.

Optical sensor types

The wide variety of photoelectric sensors with their varying function characteristics solves almost every "detection problem". The following explanations shall assist you in making the right selection for the corresponding application.

The following symbols are used for easy selection of the different optical sensors.

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	Throughbeam sensors Protective throughbeam sensors Forked sensors	LS... SLS... GS...
	Retro-reflective sensors Retro-reflective sensors with polarization filter	RK... PRK...
	Diffuse reflection scanners energetic	RK... RT...
 	Diffuse reflection scanners with background suppression with fading	FRK... HRT... RTF...
	Light Curtains	VT..., VR... KT..., KR...
	Optical distance sensors	ODS...
	Ultrasonic distance sensors	HRTU... VRTU...
	Contrast scanners	KRT...
	Color sensors	CRT...
	Luminescence scanners	LRT...
  	Fiber optic control devices Glass fiber optics Plastic fiber optics	LVS ... GF... KF...

OPERATING PRINCIPLES

Ex Sensors

AS-interface Sensors

Accessories

Services

Optical Sensor ABC

Inductive Switch ABC

Fiber optic ABC

Throughbeam sensors



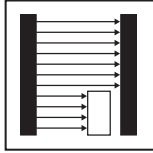
Throughbeam sensors consist of transmitter and receiver, which are contained in separate housings. The beam of the transmitter travels the whole light path only once, therefore, long operating ranges are possible when using throughbeam sensors. If choosing the correct device, throughbeam sensors are especially suited for applications under difficult conditions, e.g. if heavy contamination occurs or out in the open.

The installation is more extensive than with retro-reflective sensors as both the transmitter and the receiver must be electrically wired.

Forked sensors also belong to the group of throughbeam sensors.

Because both transmitter and receiver are integrated in the "fork", an alignment of the optical axis is not necessary.

Light curtains

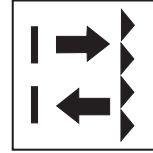


Light curtains also function according to the principle of the throughbeam photoelectric sensors. In this case, the transmitter and receiver consist of multiple elements which are positioned in a specific beam-spacing grid and which are secured in aluminum profiles. These elements are cyclically controlled one after another and analyzed.

The switching light curtains are typically used if the objects to be detected have various dimensions or shapes or the point of incidence in the horizontal plane cannot be predicted.

Measuring light curtains are another variant. These facilitate a cyclical analysis with beam precision, and can thus be used to detect 2- or 3-dimensional contours.

Retro-reflective sensors

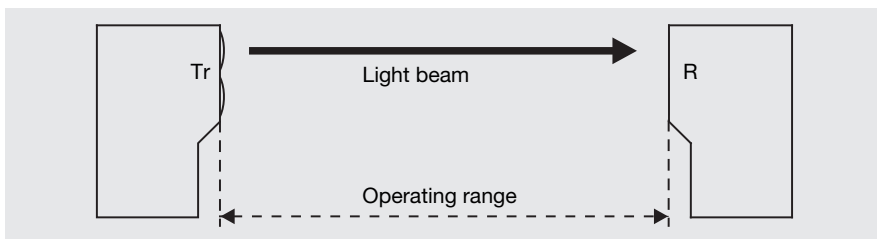


With retro-reflective sensors, the transmitter and receiver are combined in one housing. The beam of the transmitter meets the reflector and is redirected to the receiver of the sensor. The electrical wiring is therefore only required on one end of the light path.

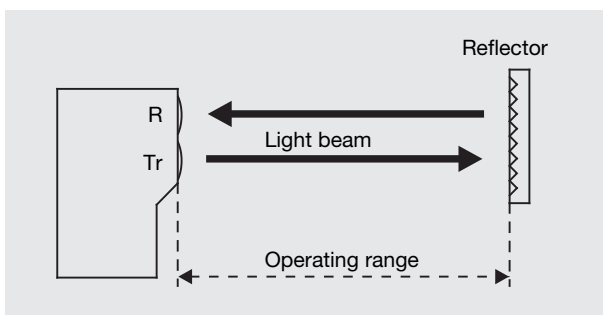
Retro-reflective sensors with polarization filter

Highly reflective objects, such as mirror-like metal parts could cause switching errors if using standard sensors. If retro-reflective sensors work with polarized light, those problems are avoided.

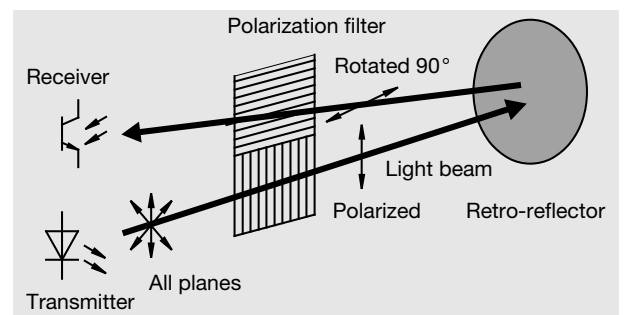
The polarized light of the transmitter meets the reflector, which "rotates" the plane of polarization by 90°. The receiver recognizes only this light from the reflector. The receiver is not tricked by "false" light reflected directly by the object because its plane of polarization was not changed.



With throughbeam sensors, the beam of the transmitter travels the whole light path only once.



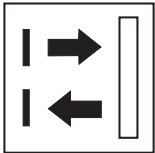
Retro-reflective sensor: transmitter and receiver are located in one housing. The reflector returns the transmitted light to the receiver.



Retro-reflective sensor with polarized optics, the receiver only recognizes the light rotated 90° by the reflector.

OPERATING PRINCIPLES

Energetic diffuse reflection scanners



With diffuse reflection scanners, as well as with retro-reflective sensors, transmitter and receiver are located in one housing.

The transmitter's beam however, is returned by the surface to be scanned itself. The scanning range of such a sensor is depending on its performance abilities and the reflection properties of the scanned surface.

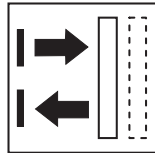
An energetic diffuse reflection scanner can detect a bright, reflective surface over a greater distance than it can detect a dark, poorly reflective one.

When choosing a device, the user should be aware of the fact that the scanning range as mentioned in the data sheet refers to the maximum possible working range based on white paper.

Diffuse reflection scanners are used primarily where neither a receiver nor a transmitter can be mounted.

Another application area for diffuse reflection scanners is the detection of objects with different reflective properties, e.g. dark print-marks on light background.

Diffuse reflection light scanners with fading



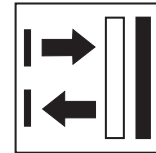
For diffuse reflection light scanners with fading, background suppression is achieved through the use of a mechanical diaphragm in front of the receiving element. Aside from this, the functionality corresponds to that of the energetic diffuse reflection light scanner.

The scanner is set to the respective scanning plane electronically. The distance between the object to be detected and the background which is to be suppressed must be large enough to ensure reliable object detection. The background should not change with respect to distance and diffuse reflection.

The black/white behavior is somewhere between that of the energetic diffuse reflection light scanner and that of the light scanner with background suppression.

The preferred areas of use for the diffuse reflection light scanner with fading are in storage/materials handling applications for the detection of storage and transport containers on conveyor belts and in packaging technology applications.

Diffuse reflection scanners with background suppression



The construction of diffuse reflection scanners with background suppression uses multiple receiver elements and thus takes into account the relation between transmitter and receiver elements.

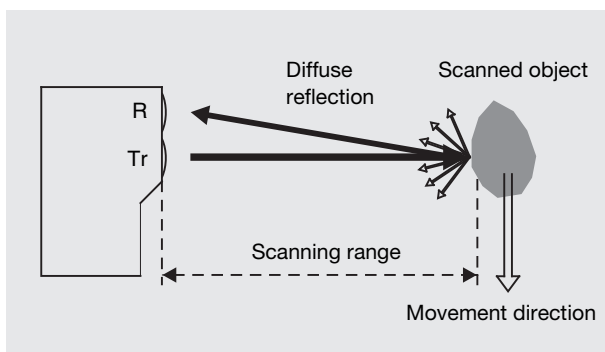
The geometric relation created makes these sensors less susceptible to varying object and background colors.

The scanner is set to the respective scanning plane electronically or mechanically and then recognizes only objects in front of this scanning plane.

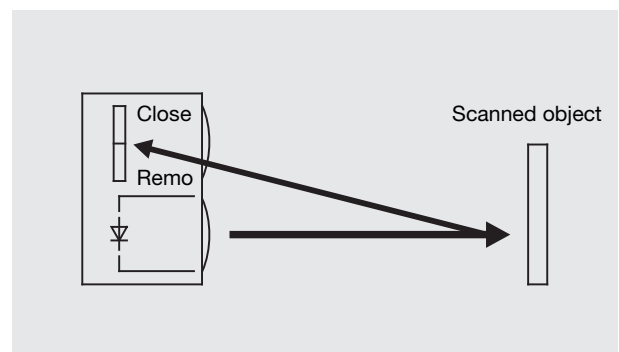
Even the smallest objects < 1 mm can be reliably detected through the use of laser transmitter diodes.

When using diffuse reflection scanners with background suppression, the mounting position has to be taken into consideration. Moving and shining objects in the background can cause interference. This interference can be minimized by mounting the sensors in an inclined position.

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Energetic diffuse reflection scanner: the transmitted light is directly reflected from the surface.



Diffuse reflection scanners with background suppression.

MEASURING SENSORS / SPECIAL SENSORS

Ex
Sensors

AS-interface
Sensors

Accessories

Services

Optical Sensor
ABC

Inductive Switch
ABC

Fiber optic
ABC

Optical distance sensors



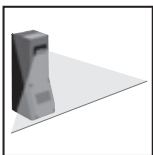
These sensors function with red, infra-red or laser light.

Through the use of various receiving elements, such as CCD lines or a PSD element, the performance of the sensor can be adapted to the application or the given requirements.

With these devices, various measurement techniques are used for distance determination. These include, among others: triangulation, phase measurement and the pulse propagation time technique. The accuracy of the measurement result is almost completely independent of differences in object color. All systems can be adapted to a given application using configuration software.

The switching signals or distances are made available via digital, analog or serial outputs of the machine controller. Connection to a fieldbus system is also possible.

Light section sensors



Light section sensors work according to the triangulation principle. Using transmission optics a laser beam is expanded to a line and aimed at a measurement object. The light remitted by the object is monitored by a position sensitive planar detector (CMOS camera).

Depending on the distance of the measurement object the laser line is projected to a different position on the planar detector. By means of this position the distance of the measurement object can be calculated.

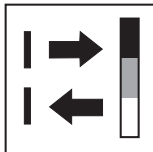
The sensor outputs 2D measurement values. It is possible to produce 3D profile data by including the movement of the measurement object.

Ultrasonic distance sensors



With these sensors, acoustic waves are transmitted and are reflected by the objects which are to be detected. The propagation time of the acoustic waves reflected back to the sensor is measured and the distance to the object calculated. This physical principle is particularly well suited for the detection of fluid-, powder-, and transparent media. The switching signals and distance information are available via digital or analog outputs. Application-specific parameters can be set directly on the sensor using programming software.

Contrast scanners

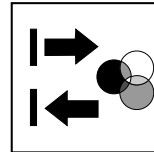


Contrast scanners are high-resolution, energetic diffuse reflection scanners which differentiate between objects and/or object colors by gray values. This means that the brightness and shininess of the object or object color strongly affect the measurement result. Contrast scanners have focusing optics and a special light-spot geometry. In order to detect slight variations in gray value, the distance to the object must not change. The resolution decreases with increasing scanning range.

If different object colors are illuminated with the same transmitter color, these may return the same gray value. In this case, positive differentiation is not possible. To avoid this, various, automatically switching transmitter colors are used.

With these characteristics, it is possible to, for example, detect any markings on any background.

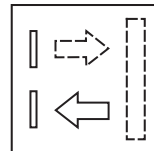
Color sensors



Color sensors are diffuse reflection scanners which break down object colors into their different spectral components using a special combination of transmitter light. The different spectral composition of the received light is analyzed by the sensor and compared with values stored previously in the sensor. If all spectral components match, the color is considered detected.

This process can be used for opaque as well as transparent objects. For shiny objects, the sensor must be oriented at an angle of 10 ... 15° to the object.

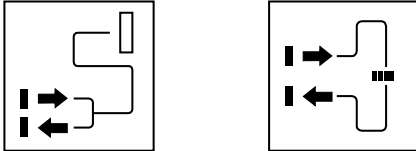
Luminescence scanners



Luminescence scanners are energetic diffuse reflection scanners which illuminate luminescing materials by means of their special UV transmission light. The resulting visible light is detected by the luminescence sensor. Some of these luminescent materials are invisible and are available in a variety of solid and fluid forms. These can be used to make markings which are invisible under normal lighting conditions.

OPTIONS

Fiber optic control devices



A specialty of modern optical electronics are fiber optic sensors. The complete functionality of the photoelectric sensor is located in one controlling device.

This determines the electrical key data of the system. The special thing about fiber optic control devices is that the light of the transmitter element is transported to the place to be scanned and back to the receiver element (both in the control unit) through the fiber optics.

The transporting effect of the light is based on a total reflection. This happens always when light comes in contact with a medium having a lower optical density than the medium in which it is traveling. In a cylindrical fiber, the light undergoes total reflection as it is reflected back and forth. As a result, the light can follow the bends of the curved fiber optics.

Fiber optics made of glass as well as plastic are available, functioning on the throughbeam and scanning principle. Depending on the application requirements and the environmental conditions at the place of application, a selection from the extensive range of products should be made.

Mini sensors

The mini sensors are well suited for installation locations with limited space. These are commonly known as "conventional", photoelectric sensors without amplifiers in miniature format. Their small construction and the extremely small bending radius of the connection cables facilitate installation even in places which are difficult to access.

Through the possibility to choose from a number of amplifiers of different sizes and functions, adaptation to any kind of application is especially easy.

Optical sensors with additional functionality

Today, optical sensors can do much more than just detect objects. The advances in electronics and microelectronics have also left their footprints in photoelectric sensor technology. As a result the sensors have become "intelligent" and offer numerous useful options. These functions simplify sensor use and have created entirely new application possibilities.

Protective sensors



A contactless active protective device (AOPD) is designed for machines with possible risk of injury. It offers protection by telling the machine to move into a safe operating state before a person can get into a dangerous situation.

To choose the right protective device, the following has to be observed:

- the possible state of injury
- the duration of time spent by a person in the hazardous area
- the possibility to prevent dangers

Depending on the safety requirements, two different categories are possible:

- Contactless active protective device with testing function: Category 2.

On these systems, the functional safety is checked through cyclically

reoccurring, external testing pulses.

- Contactless active protective device with self-monitoring: Category 4
- On these systems, the functional safety is permanently checked through self-monitoring.

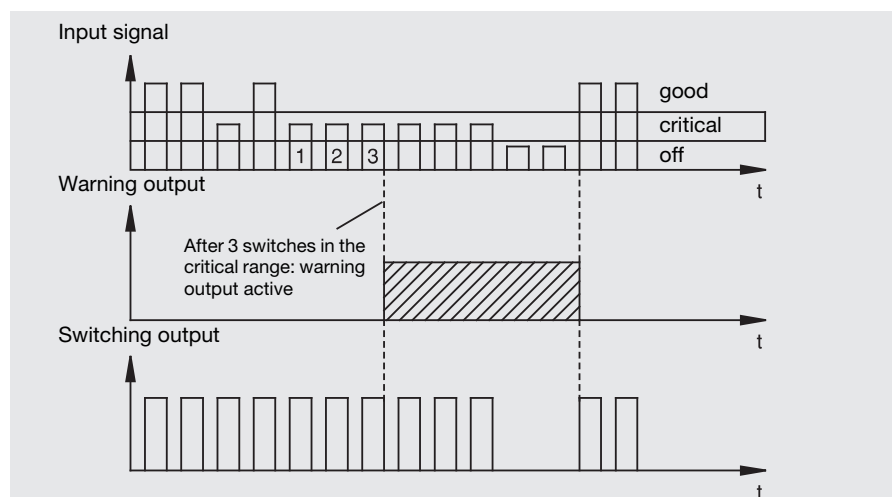
It is the responsibility of the machine manufacturer and/or user to determine with which standard the respective application is to be measured.

Automatic contamination control: autoControl

Though optical sensors function reliably, they are not immune to damage, misalignment or contamination of their optics.

Monitoring circuits protect against such "accidents" by warning the user in good time. Such a warning signal has many advantages in practical life. It indicates interference before an error can occur. Therefore, precise maintenance work is possible; unnecessary procedures are avoided. It is possible to differentiate between two operating principles: time dependent and counting.

With time-dependent monitoring, an integrated monitoring circuit measures the time the signal spends in the critical brightness range and triggers the warning signal as required.



Counting operating principle (autoControl)

This time-dependent method, however, is only suitable for static applications. Dynamic processes can cause "false" error messages. For this purpose, a testing circuit, which works on a counting basis is better suited.

The patented autoControl testing circuit monitors the input pulse and detects possible impairment by counting the reduced incoming signals. If the incoming light signal is at a reduced level for three consecutive switching cycles, this critical function status is evaluated as a negative trend and the warning signal output is activated.

At this point in time, the switching function of the optical sensor is not yet impaired. Therefore, targeted maintenance measures can be taken before a complete system failure occurs. If the signal is within limits again, the warning output is reset automatically. During short-term interference, this means if the light reception is reduced less than three times, the warning output is not activated.

AS-interface



The AS-interface is an optimized bus system for the lowest field level of the automation technology

Aim of the AS-interface is the cost saving connection of binary sensors and actuators to a primary controller. Voltage supply and data exchange pass through the same (unshielded) two-wire connection. Bus-compatible sensors with integrated AS-i chip can be connected directly to the bus; connection of common sensors is possible through so-called coupling modules.

The tree structure of the AS-i bus system as well as the technical key features enable a considerable reduction of expenditures during wiring and installation. The AS-interface is therefore a future-oriented alternative to standard parallel wiring.

Housing

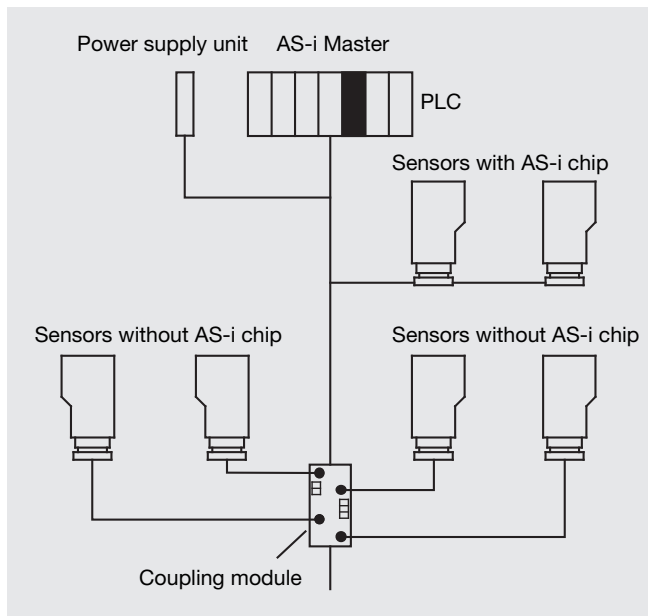
Photoelectric sensors are located in either a robust plastic or metal housing.

Especially under rough operating conditions, the use of metal-type devices which offer special protection against mechanical and chemical influences is recommended.

IP protection classes

In order to make the protection of housings against foreign objects and water comparable, the protection classes have been defined in DIN 40050. The first digit refers to the protection against foreign objects, the second to water protection.

Almost every sensor is dust-proof and protected against immersion.



AS-interface: bus coupling

+49 (0) 7021 573 0

1st digit	Contact protection and foreign object protection	2nd digit	Water protection
0	No special protection	0	No special protection
1	Against large foreign objects, dia. >50mm	1	Against vertically falling water drops
2	Against medium foreign objects, dia. >12mm	2	Against angled falling water drops (up to 15° from vertical)
3	Against small foreign objects, dia. > 2.5mm	3	Against sprayed water (up to 60° from the vertical)
4	Against corn-formed foreign objects, dia. > 1mm	4	Against splashed water from all directions
		5	Against water jets from a nozzle from all directions
5	Dust protected; dust deposits permitted but not in quantities which interfere with the function of the device	6	Against strong water jets
		7	Against intermittent submerging
		8	Against permanent submerging
6	Dust proof	9K	For high-pressure / steam-jet cleaning

IP Protection classes acc. to IEC 529 and/or DIN 40050

EQUIPMENT

Optics

The light outlet surface of a photoelectric sensor is, depending on the model, made of plastic or glass. Covers or optics made of hard glass fulfill the highest requirements. They are resistant against detergents, chemicals and scratching.

To increase the effectiveness of the optics and to reduce the effects of possible contamination, glass as well as plastic optics have the largest possible surface area.

Diaphragms

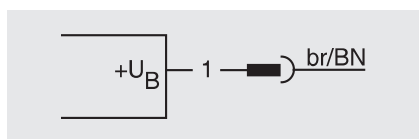
In order to detect small objects over great distances, appropriate pin or slit diaphragms, which are fitted on the transmitter and receiver, are offered for some throughbeam sensors.

As a result e.g. drilling bits can be safely detected even at a distance of several meters. The size of the diaphragm is dependent on the size of the object and the required range.

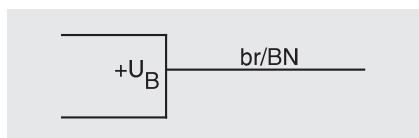
Connection types

There are three common types of connection for optical electronic sensors: plug, cable or terminals.

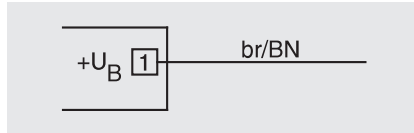
The three different possibilities can be easily identified in the connection illustrations of the individual devices.



Devices with this connection diagram are connectable via plugs. Ready-made connection cables with fitting connectors are available for almost every sensor.



These devices have a cable connection, usually with a 2m cable. Special cable lengths are available upon request.



Devices with this connection diagram are equipped with screw terminals. Cables are fed through screw fittings.

Switching delay

Photoelectric sensors or amplifiers with integrated switching delay work with slow operation and/or slow release. Slow operation is used if short events need to be suppressed. Slow release prolongs the duration of the output signals which is often necessary for control purposes.

Outputs

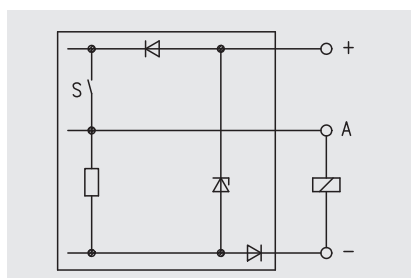
Optical electronic sensors are most commonly offered with relay or transistor output. Relay outputs with change-over contacts are the most universal, however, they also have their disadvantages: relays require a large amount of space, their time delays cannot be accepted in every application, and, due to their moving parts, their operating life is limited.

The user can choose between NPN, PNP and push-pull type transistor outputs. It is therefore optimally compatible with the respective control system to be connected.

PNP transistor outputs

The PNP transistor output is a high-impedance switching output. It switches positive potential to the connected load.

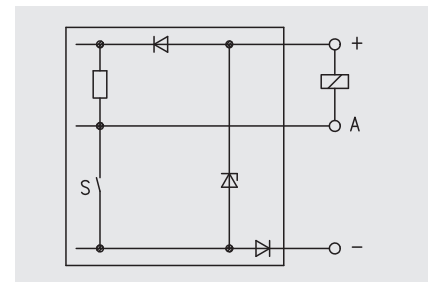
Indicated in connection drawing by:



NPN transistor outputs

The NPN transistor output is a high-impedance switching output. It switches GND to the connected load.

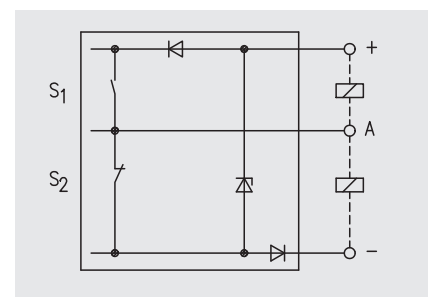
Indicated in connection drawing by:



Push-pull transistor output

This type of transistor output has a low impedance and is immune to interference (push-pull technology). The outputs can be used in connection with both, PNP and NPN control systems. Symmetric response behavior is a further advantage. Push-pull outputs must not be connected in parallel.

Indicated in connection drawing by:



Short-circuit protection

Transistor outputs are usually short-circuit proof. This is achieved by monitoring the output current and, should it exceed a certain level, cutting off the supply to the transistor.

The information on the maximum current given on the data sheet have to be observed despite the short-circuit protection.

Sensors with laser transmitter



(LASER = **L**ight **A**mplification by **S**timu-
Emission of **R**adiation)

Laser diodes as sensor light source enable the realization of higher operating and scanning ranges with small beam geometries.

Red light laser diodes offer the advantage of fast function control and alignment. The beam output is expressed by the laser class. On sensors of the laser class 1 or 2, no additional protective measures are specified.

Laser safety classes

Laser-specific regulations are included in the European Standard EN 60825-1 - Safety of Laser Devices (corresponds to IEC 60825-1).

The products are divided into danger classes according to the intensity of the laser radiation.

Class 1:

The accessible laser radiation is not dangerous - integrated safety by means of constructive measures such as laser power monitoring.

Class 1M:

Same as class 1, however the use of optical instruments may pose a threat.

Class 2:

Due to low transmitting power, the accessible laser radiation is usually not dangerous. Natural reflex reaction (eyelid closure) is usually adequate eye protection. Avoid prolonged, direct eye exposure to the beam, however.

Class 2M:

Same as class 2, however the use of optical instruments may pose a threat.

Class 3R:

Looking directly into the laser beam with optical aides, such as a telescope or magnifying glass, may be dangerous.

Class 3B:

Looking directly into the beam is dangerous

Class 4:

High laser power - even diffuse reflection may be dangerous, e.g. for skin and eyes.

Laser security

For the use of laser products of Leuze electronic, the standard IEC 60825-1 applies: Do not stare into the beam - not even with optical instruments.

In connection with visible beams, eye-protection is usually guaranteed through the eye lid closing reflex. The standard prescribes that the laser beam path should be closed at the end of its purpose-oriented way, where this is practically and responsibly possible. Do not point the laser at people (head level).

Application of laser optical sensors

All laser sensors work with small light spots. Through this, a corresponding object resolution and exact positioning is achieved.

In order to use these advantages, throughbeam and retro-reflective sensors are equipped with a mechanical focus adjustment (collimator). Through this, the light spot can be optimally adjusted to the application over the complete working distance.

CDRH

Laser products which are imported into the USA are to be specified by the manufacturer to the CDRH (**C**enter for **D**evelopments and **R**adiological **H**ealth), a branch of the FDA. Verification of conformity with the applicable US rules for laser products (21 CFR 1040.10 and, if applicable, 1040.11 including the applicable laser notices, issued by the CDRH) is to be documented and an appropriate certification attached to the products.

Products with the CDRH certification in the catalog or to which the certification label has been attached fulfill the specified rules.

APPLICATION

Parallel and serial connection

A direct logical linking is possible on optical sensors with PNP or NPN transistor outputs. Through internal protective circuits, up to ten sensors with equal output potential (PNP or NPN) can be connected to a parallel circuit. This can be useful for, among other things, collective messages (e.g. from warning outputs).

An activation input is needed in order to connect several sensors in series.

That means that, for example, the PNP output of the first device has to be connected to a "positively" activated input of the second device etc.

Both parallel and serial connection can be performed directly on the devices with PNP or NPN transistor outputs. This reduces wiring requirements and PLC capacity in the form of inputs and outputs.

Parallel connection of optical sensors with push-pull transistor output is not permitted.

Alignment of optical sensors

The optimal alignment is absolutely required for fault-free function characteristics.

With throughbeam sensors, the transmitted beam should meet the receiver's optics as centrally as possible. For this purpose, the light beam is to be corner-cut from all four directions, e.g. with a piece of cardboard.

When optimally aligned, the receiver switches with symmetric shadowing. In connection to large ranges, a laser alignment device simplifies the adjustment. For some devices, special alignment and mounting parts with three-point adjustment are available.

There are two possibilities for adjusting a retro-reflective sensor: the user can cover all four sides of the reflector with an object until the sensor output switches. The forward switching points are symmetric if the alignment is optimal. The second possibility involves covering the outer area of the reflector with non-reflective material, then aligning the sensor (the material is removed upon conclusion of the procedure). When mounting the reflector, it is essential to observe that it is fixed at right angles towards the light axis. However, variations of up to 15° are unproblematic.

Sensors with red light LED or red light lasers offer simple function control and in addition to that fast and simple alignment.

Operating range

Describes the range which should not be exceeded during practical use of the sensor.

If the sensor is used within its operating range, there is still adequate performance reserve present to compensate for e.g. light soiling or misalignment.

Operating range limit

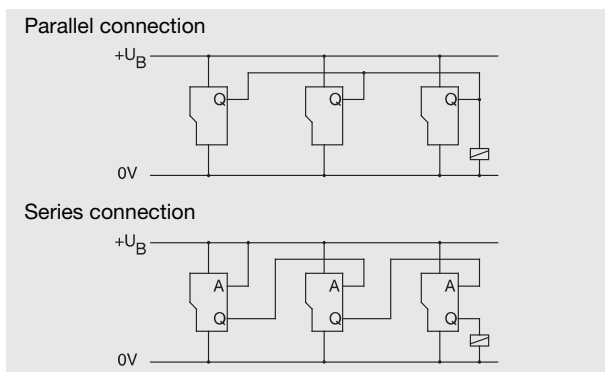
Describes the maximum possible range of the sensor. If the sensor is

used at this operating range limit, the sensor functions without performance reserve. This is also referred to as "performance reserve = 1". No additional protection is present, e.g. for soiling. With regards to functional safety, a sensor should never be used at the operating range limit.

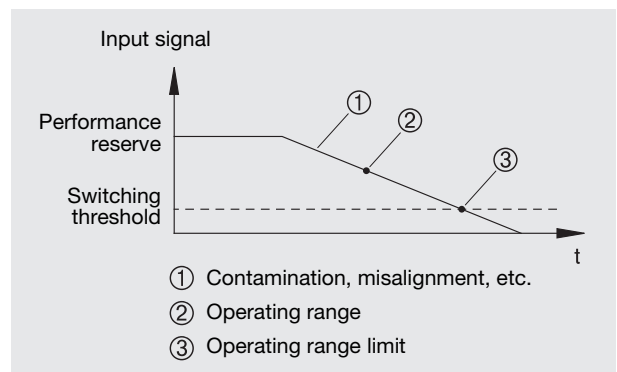
Performance reserve

Receivers of optical sensors require a minimum amount of light to be able to switch (switching threshold). All light over and above this minimum amount is designated as "performance reserve". A distinction must be made between the internal performance reserve and the performance reserve selected by the user. The internal performance reserve provides the user with additional security that the information given on the data-sheet is not the limit of what is actually possible. If, in individual cases, heavy contamination can be expected, the user should provide additional performance reserve by selecting the sensor with the next higher operating range.

We reserve the right to make changes • Opto_ABC_EN.fm

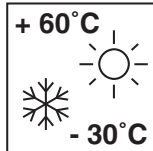
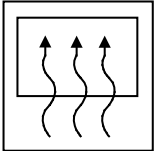


Parallel and serial connection



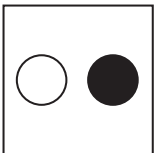
Performance reserve: the light intensity during normal operation is clearly above the minimum value required by the receiver to trigger.

Optics heating and low-temperature versions



Optical sensors are designed for a broad temperature range. Extreme conditions, e.g. intense cooling plants, permanent outdoor installation or on gates and sluices with frequent high/ low temperature transitions, require special low-temperature versions with optics heating.

Light and dark switching



With light switching optical sensors, the transistor is switched through if the light path is free and disabled if the light path is interrupted.

With dark switching sensors it is the other way around. Many photoelectric sensor types offer the choice between light and dark switching variants.

Optical sensors with changeover relay are usable in both operating modes. The user chooses through the respective connection.

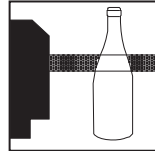
Static - Dynamic

The optical sensor output directly follows the light reception during static operation. During dynamic operation however, the optical sensor reacts to the change of brightness. A signal of a certain length is deducted from the change of light to dark.

Dynamic optical sensors are suitable for applications which would otherwise deliver impulses too short for evaluation. A typical application would be the monitoring of thin thread on spinning machines.

The torn thread passes through the light path only once.

User guidance



For detection of highly-transparent objects, special retro-reflective sensors have to be used. Adjustment of these sensors is normally very time-consuming and varies from sensor to sensor.

With user guidance, adjustment happens without an object. Through this, a fast and always reproducible adjustment is achieved. For PET, clear and colored glass, separate operating points are set within the sensor.

Tracking: Automatic contamination compensation



Sensors for the detection of transparent objects such as foils and glass surfaces are very sensitive to soiling due to their detection characteristics. The tracking function compensates for this gradual soiling. The sensor determines the current reception level and compares this with the initial reference value. In this way, the regulator compensates not only for the soiling, but also for the elevated signal level which occurs after cleaning without the need for new system calibration. It is no longer necessary to stop the machine. In addition, this tracking function makes possible automatic sensor commissioning. Commissioning calibration in the form of a teach-in is no longer necessary. The maintenance intervals are extended considerably.

A²LS: active suppression of extraneous light

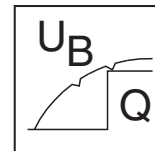


A²LS is the acronym for **Active Ambient Light Suppression**, the active suppression of extraneous light. And it functions as follows:

An optical sensor transmits and receives light at a specific signal frequency and phase. If the sensor detects ambient light which is similar in frequency and/or phase of its own sensor signal, the optical sensor actively and automatically changes its signal or the phase. A high degree of permanent detection reliability is achieved in this way.

As a result, not even the pulsed light from energy-saving lamps or other optical sensors has a negative effect on the A²LS optical sensors.

Delay before start-up



During connection of the operating voltage to a sensor, different electronic standardizing procedures are performed internally. The device is not working during this period. Also during this phase, a short, undefinable output pulse can be generated. The delay before start-up suppresses sensor operation until all device-internal preparations have been concluded. This process takes approximately 50 to 200ms.

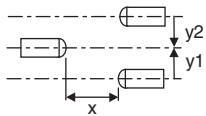
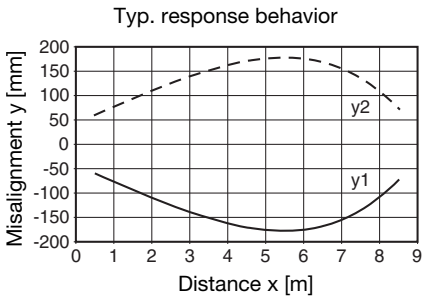
DIAGRAM TYPES

Typical response behavior

Throughbeam sensors:

The diagram illustrates the possible offset of the optical axis from the transmitter and receiver as a function of their distance.

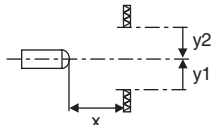
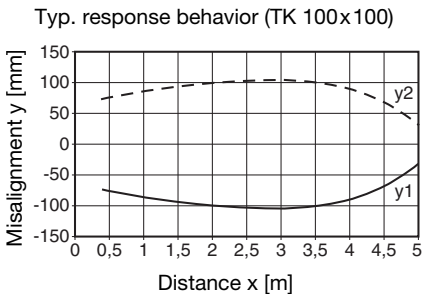
Detection by the transmitter and receiver takes place within the two curves.



Retro-reflective sensors:

The diagram illustrates the possible offset of the optical axis of the sensor and the boundary of the reference reflector TK 100x100 as a function of the distance.

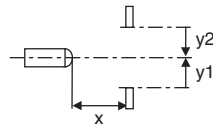
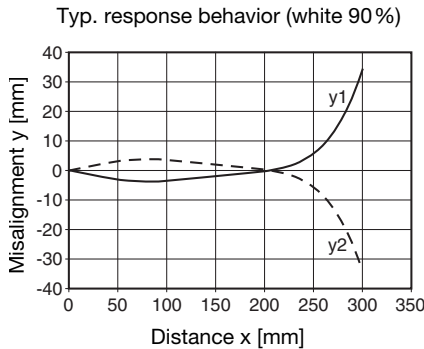
The sensor is detected by the reflector within the two curves.



Energetic diffuse reflection scanners and diffuse reflection scanners with background suppression:

The diagram illustrates the possible offset of the optical axis of the sensor and the boundary of the measured object (90% white) as a function of distance.

With larger distances, the edge of the measured object must cover the optical axis in order to be detected.



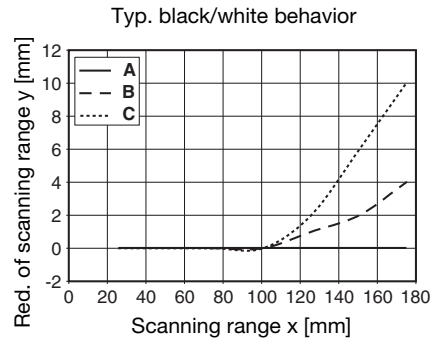
Typical black/white behavior

Diffuse reflection scanner with background suppression:

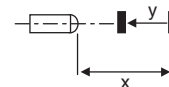
The diagram illustrates the reduction of the scanning range of different-colored measured objects relative to a white measured object as a function of distance.

In the diagram, the scanning range reduction from black (6% diffuse reflection) and gray (18% diffuse reflection) relative to white (90% diffuse reflection) is plotted.

In this example, a scanning range reduction of 8mm relative to black is read for a scanning range setting on the sensor of 160mm. Thus, the sensor has a scanning range of 152mm on black.



- A white 90%
- B gray 18%
- C black 6%



STANDARDS AND CERTIFICATION

Optical sensors for the potentially explosive area



In order to use optical sensors in potentially explosive atmospheres, it is necessary to take constructive measures to avoid the explosion of an inflammable mixture even if an error occurs. The principle of such a measure is marked by the protection method (examples: pressurization or intrinsic safety).

The protection method intrinsic safety is available for all sensor operating principles. They are examined and equipped with the respective certificate of conformity.

Intrinsically safe optical sensors

An intrinsically safe circuit must never, neither in normal function nor in abnormal conditions, release sufficient ignition energy which can through

- sparks (opening, closing, short circuit, ground contact)

or

- extreme heating of the operating material and conductors

cause an ignition of the surrounding explosive atmosphere.

Switching amplifiers take over the function of dividing the explosive area and the safe area. The connection to the sensor is done via the NAMUR-interface acc. to EN 60947-5-6 (IEC 60947-5-6). The different switching amplifier types differ with respect to operating voltage and output. Via DIP switches the output signal can be inverted (light/dark switching) and wire-break or short-circuit monitoring can be activated.

CE labeling



An important goal of the European Union (EU) is free trade and the standardization of applicable regulations within EU member countries. To achieve this aim, the European parliament has enacted certain guidelines.

2006/42/EC Machinery directive

2004/108/EC EMC directive

2006/95/EC Low voltage directive

94/9/EC ATEX Product directive

If a product falls under one of these directives, it must only be placed on the market if it meets the requirements of the respective directive. The product also has to be marked with the CE label. The CE certification certifies conformity with the applicable guideline(s).

All listed products are equipped with the CE certification.

Standards

For optical sensors, there are independent, harmonized product standards on both national and international levels. These product standards ensure adherence to the corresponding basic and specific standards.

Among other topics, optical sensor functions, construction requirements, pin assignments, temperature ranges, protection classes, electromagnetic compatibility as well as vibration and shock load are described in these standards.

The applicable international standard is the IEC 60947-5-2, for Europe EN 60947-5-2 (in Germany: DIN EN 60947-5-2).

C-UL-US certification



Products with this certification meet the requirements specified by UL (Underwriters Laboratory Inc.) for both the USA as well as Canada. The adherence to the specifications is checked during periodical audits by the UL officials or their representatives. The product standard which is used is UL 508.

CDRH

Laser products which are imported into the USA are to be specified by the manufacturer to the CDRH (Center for Devices and Radiological Health), a branch of the FDA. Verification of conformity with the applicable US rules for laser products (21 CFR 1040.10 and, if applicable, 1040.11 including the applicable laser notices, issued by the CDRH) is to be documented and an appropriate certification attached to the products.

Products with the CDRH certification in the catalog or to which the certification label has been attached fulfill the specified rules.

INDUCTIVE SWITCH ABC

Introduction

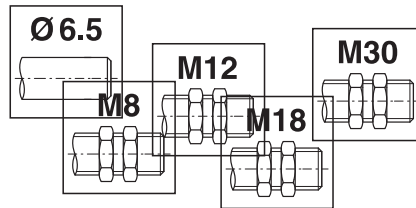
The inductive switch ABC shall assist you in selecting the right switch.



You will find here explanations on the different inductive switch types, the additional functions and a lot of information for the practitioner.

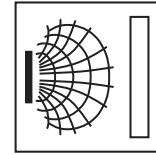
Inductive switch types

The wide variety of constructions with their varying scanning ranges solves almost every "detection problem".



The following explanations shall assist you in making the right selection for the corresponding application.

Functionality

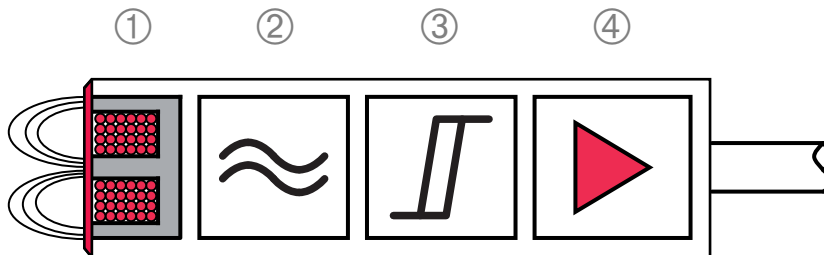


The function of inductive switches is based on the interaction of metallic conductors with the electromagnetic field of the switch.

Eddy currents are induced in the metallic damping material, and these extract energy from the sensor's alternating field. If the amplitude of the internal oscillation falls below the factory-set switching threshold, the signal at the switch output changes.

Function groups of a switch

- ① Coil and ferrite core define the geometry and hence the operating range of the electromagnetic field.
- ② The oscillator defines the oscillating frequency and supplies the coil with energy.

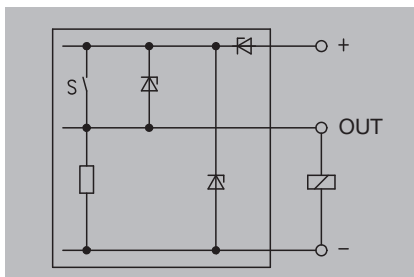


- ③ The trigger circuit detects the changes in the oscillating circuit.
- ④ The driver stage amplifies the trigger signal for evaluation by a control.

Outputs

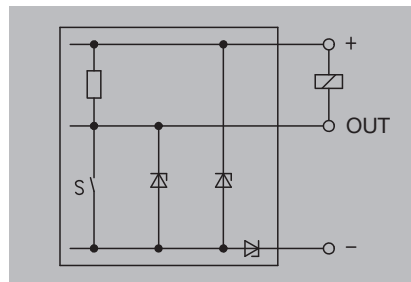
PNP transistor outputs

The PNP transistor output is a high-impedance switching output. It switches positive potential to the connected load.



NPN transistor outputs

The NPN transistor output is a high-impedance switching output. It switches GND to the connected load.



Short-circuit protection

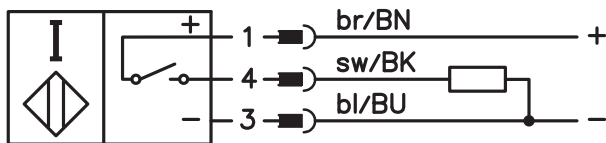
Transistor outputs are usually short-circuit proof. This is achieved by monitoring the output current and, should it exceed a certain level, cutting off the supply to the transistor.

The information on the maximum current given on the data sheet have to be observed despite the short-circuit protection.

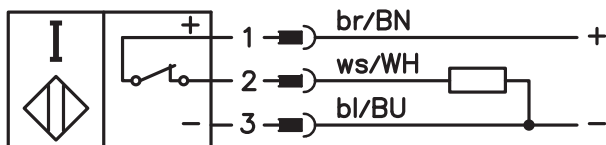
Switching functions

PNP (+) switching

NO (Normally Open - make-contact)

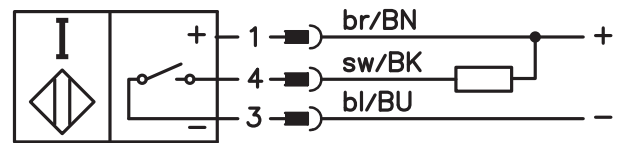


NC (Normally Closed - break-contact)

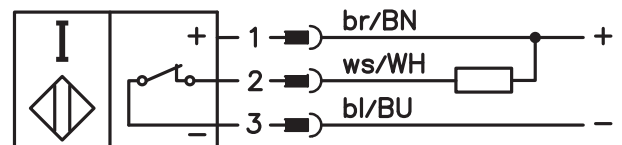


NPN (-) switching

NO (Normally Open - make-contact)



NC (Normally Closed - break-contact)



MOUNTING / INSTALLATION

Metal installation

The inductive switches can be classified as "**embedded installation possible**" and "**embedded installation not possible**".

Switches for which embedded installation is possible may be recognized from their metal sleeve, which does not fully stretch to the active surface, but falls a few millimeters short depending on the switch's diameter.

Switches that are not for embedded installation permit a larger operating distance to be achieved.

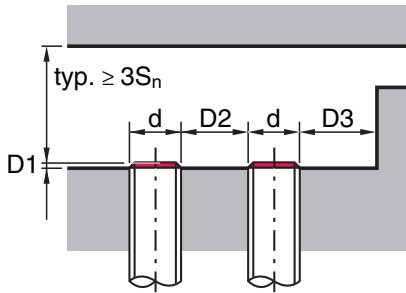


Notice:

The individual installation specifications may be found in the data sheet of the respective switch.

Embedded installation in metal

For inductive switches capable of embedded installation, the active surface can be installed flush with the surrounding metal surface.



For switches with increased operating distance S_n (typically the scanning range limit), the active surface must protrude by the distance $D1$.

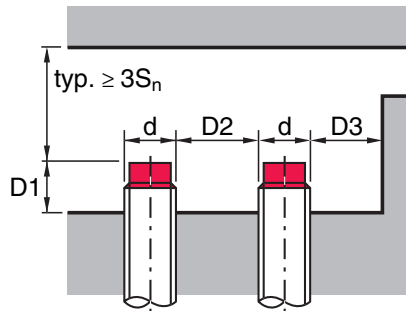
If switches for embedded installation are mounted side by side, a distance of more than $D2$ must be kept.

The distance to the adjacent metal walls must be at least $D3$.

The distance of the switch's active surface to the opposite metal surfaces must be $3 \times S_n$.

Non-embedded installation in metal

Inductive switches for non-embedded installation can be recognized by the protruding caps. This area must not be installed inside metal. This lets these switches achieve a larger operating distance S_n .



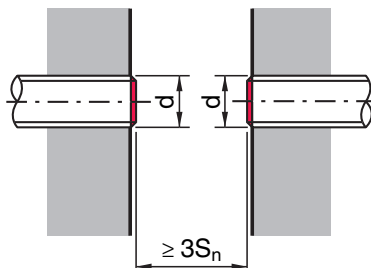
The distance from the switch's active surface to the surrounding metal surface must be $D1$.

If switches for non-embedded installation are mounted side by side, a distance of more than $D2$ must be kept. The distance to the adjacent metal walls must be at least $D3$.

The distance of the switch's active surface to the opposite metal surfaces must be $3 \times S_n$.

Installation of 2 switches opposite to each other

If two inductive switches are mounted opposite each other, the minimum distance between the active surfaces must be $3 \times S_n$.



Tightening torque

If the holding nut is tightened too much, the cylindrical switches may be mechanically damaged. In order to avoid this, the indicated maximum admissible tightening torques must not be exceeded:

Installation size	max. tightening torque
M8 x 1	4 Nm
M12 x 1	10 Nm
M18 x 1	30 Nm
M30 x 1.5	60 Nm



Notice:

For precise individual values please refer to the data sheet of the respective switch.

IP protection class

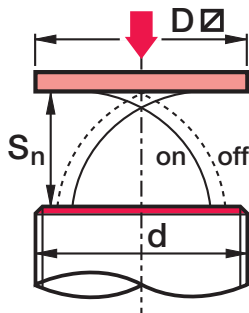
In order to make the protection of housings against foreign objects and water comparable, the protection classes have been defined in EN 60529/IEC 60529.

The first digit refers to the protection against foreign objects, the second to water protection.

Leuze inductive switches meet at least protection class IP 67. The models featuring stainless steel housings were specifically developed against intrusion of humidity during high-pressure cleaning and pass the tests of protection class IP 69K according to DIN 40050 Part 9.

Typical response behavior

The specified values for the operating distance S relate to the damping of the inductive switch using a standard measuring plate in axial direction. If the measuring plate is laterally offset or the switch is approached radially, the actual operating distance S_r shifts.



As an example, the diagram above shows the response behavior of an inductive switch: the operating distance in relation to axial and radial offset.



Notice:

The type-specific response curves may be found in the data sheet of the respective switch.

Active surface

The active surface is the area from which the electromagnetic field of the switch emanates. It is used as reference point for the specified operating distance.

The area is determined by the coil core geometry and roughly matches the surface of the core cap.

Standard measuring plate

The standard measuring plate is used to determine the inductive characteristics such as operating distance, repeatability, or temperature drift according to IEC 60947-5-2.

The plate is a square of 1 mm thickness and made of steel (Fe360). The side length a of the square is the diameter of the inscribed circle of the active surface, or three times the rated operating distance S_n if this is the larger value.

Operating distances

The operating distance S defines the distance from a standard measuring plate to the inductive switch at which the signal at the switch's switching output changes.

Typ. Scanning range limit (rated operating distance S_n)

The rated operating distance S_n is a parameter for the specification of operating distances. It considers neither manufacturing tolerances nor changes due to external influences such as voltage and temperature.

The actual operating distance S_r of an inductive switch is measured under defined installation conditions, at rated operating voltage and an ambient temperature of $23^\circ\text{C} \pm 5^\circ\text{C}$ ($0.9 \times S_n \leq S_r \leq 1.1 \times S_n$).

The usable operating distance S_u is measured over the complete ambient temperature range (typically: $-25^\circ\text{C} \dots 70^\circ\text{C}$) at a supply voltage of 85% ... 110% of the rated value ($0.81 \times S_n \leq S_u \leq 1.21 \times S_n$).

Scanning range (assured operating distance S_a)

The assured operating distance S_a describes the scanning range that ensures a safe operation of the switch across the specified temperature and voltage range.

For inductive switches, the assured operating distance S_a is between 0% ... 81% of the rated operating distance S_n .

Reduction factors

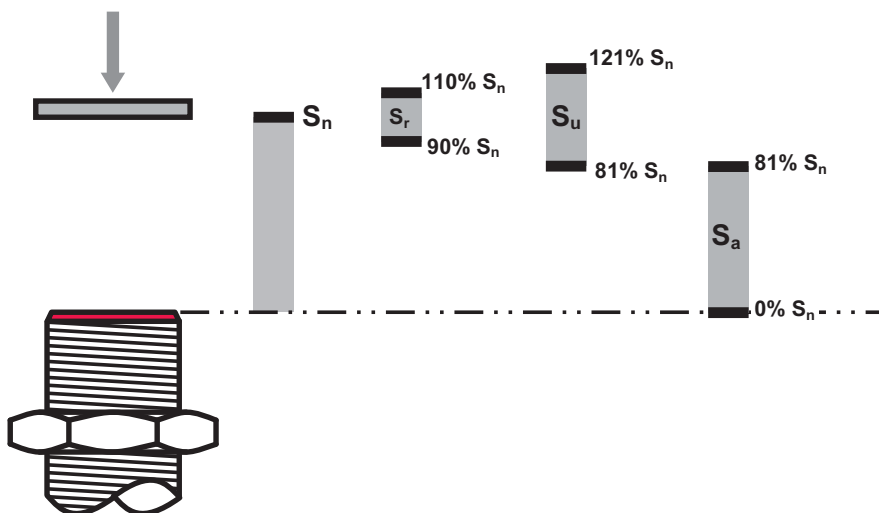
The reduction factor is a value that changes depending on the material. It describes the change of the operating distance S if the damping material differs from Fe360: $S_r = \text{factor} \times S_n$

Material	Factor
Steel (Fe360)	1.0
Copper	0.18 ... 0.50
Aluminum	0.25 ... 0.50
Brass	0.33 ... 0.60
Stainless steel	0.63 ... 0.90



Notice:

For precise individual values please refer to the data sheet of the respective switch.



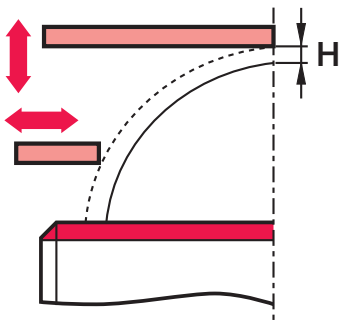
CHARACTERISTICS

Delay before start-up

The delay before start-up is the maximum delay between switching the operating voltage on and the switch reaching readiness for operation.

Hysteresis H

The hysteresis H is the range between switch-on and cut-out point (switch reversal) of an inductive switch.



It is determined at the rated operating voltage and an ambient temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

At the most, the hysteresis is 20% of the actual operating distance S_r .

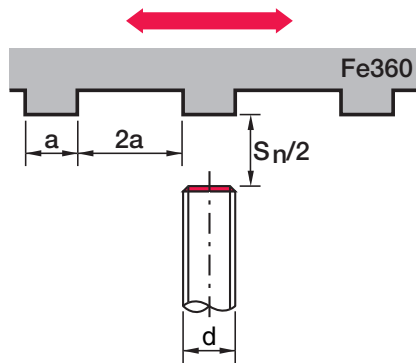
Repeatability

The repeatability of the actual operating distance S_r is measured over eight hours at an ambient temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, a relative humidity of 90%, and the rated operating voltage.

The difference between two arbitrary measurement values must not exceed 10% of the actual operating distance S_r .

Switching frequency

The switching frequency indicates the maximum possible number of switching sequences per second at a constant pulse-pause ratio (1:2) and half the rated operating distance S_r .



Ambient temperature

The ambient temperature range specified (typically $-25^{\circ}\text{C} \dots +70^{\circ}\text{C}$) must not be exceeded, as the switches may be damaged in this case. The functionality outside these limits is also not defined.

Temperature drift

The temperature drift is the deviation of the actual operating distance S_r within the temperature range of $-25^{\circ}\text{C} \dots +70^{\circ}\text{C}$. According to IEC 60947-5-2, the difference is at most 10% compared to the rated value.

Voltage drop U_d

In the switched-on state, a current-dependent voltage drop is present across the output transistor.

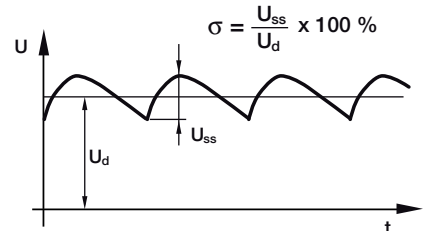
The actual output voltage is the applied operating voltage less the voltage drop.

Operating voltage U_B

The operating voltage is the voltage at which the switch operates safely. The operating voltage is 10 ... 30VDC.

Residual ripple σ

The residual ripple is the AC voltage superimposed onto the DC voltage.



If the residual ripple is too high, the switching behavior of the switch may be undefined.

The maximum allowable operating voltage U_B must not be exceeded, even during the peaks of U_{ss} .

Open-circuit current I_0

The open-circuit current is the current consumption of the inductive sensor for operating LED, amplifier etc. in the locked state.

Output current I_L

The devices are designed for a maximum output current I_L . If this current is exceeded, even for brief periods, the overload protection activates.

Residual current I_r

If the output is switched off, the residual current flows through the output transistor and therefore through the load connected.

Electromagnetic compatibility – EMC

The EMC robustness of the products listed meets the high requirements of the IEC 60947-5-2. They are subjected to the following tests:

- IEC 60255-5 1 kV
- IEC 61000-4-2 Level 3 (ESD)
- IEC 61000-4-3 Level 3 (RFI)
- IEC 61000-4-4 Level 3 (Burst)

STANDARDS AND CERTIFICATION

IEC 60947-5-2



There is a harmonized product standard for inductive switches.

It provides a reference to the respective basic standards and basic engineering standards and describes, among others, the inductive switch functions, pin assignments, temperature ranges, protection classes, electromagnetic compatibility, and the stress from swinging and shock.

The applicable international standard is the IEC 60947-5-2, for Europe EN 60947-5-2 (in Germany: DIN EN 60947-5-2).

CE labeling



An important goal of the European Union (EU) is free trade and the standardization of applicable regulations within EU member countries. To achieve this aim, the European parliament has enacted certain guidelines.

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2004/108/EC EMC directive

2006/95/EC Low voltage directive

94/9/EC ATEX Product directive

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Ex Sensors

AS-interface Sensors

Accessories

Services

Optical Sensor ABC

Inductive Switch ABC

Fiber optic ABC

FIBER OPTIC ABC

Introduction

The fiber optic ABC shall assist you in selecting the right sensor system. You will find here explanations on the different fiber optic switch types, the additional functions and a lot of information for the practitioner.

Fiber optics

Fiber optics are cables for the transmission of light, e.g. from the transmitter of a fiber optic amplifier to an object or from an object to the receiver of a fiber optic amplifier. The evaluating electronics are therefore decoupled spatially from optical outlet side.

Due to the low damping effect in comparison to copper cables, fiber optics can also be advantageous for long cable lengths. Depending on the head shape, application is possible even when space is very tight.

Plastic fiber optics

The KF and KFX plastic fiber optics have an active fiber core made of plastic, usually PMMA.

It is typically constructed from a compound of several individual optical fibers.

Depending on the material, the standard fibers have an operating temperature range of -55°C ... +70°C, heat-resistant plastic fibers up to max. 105°C.

Advantages:

- very flexible fiber structure
- smallest possible bending radius
- also suitable for low temperatures
- economical

Disadvantages:

- not for temperatures > 105°C
- low mechanical stability
- not for vacuum applications

Glass fiber optics

The GF glass fiber optics have an active fiber core made of glass, mostly quartz glass.

It is typically constructed from a compound of several individual optical fibers.

Glass fiber can also be used at very high temperatures. When the sheathing material is brass, the operating temperature is

-30°C ... +200°C, when it is stainless steel or silicone, +300°C can be reached for short periods.

Advantages:

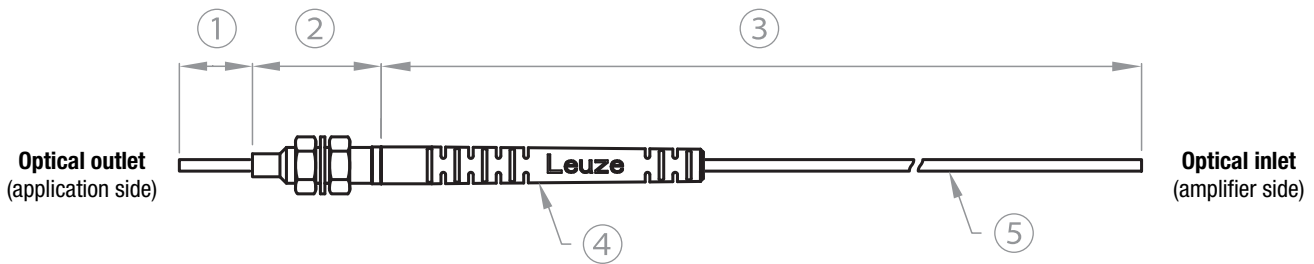
- high-temperature resistant
- robust
- suitable for vacuum applications

Disadvantages:

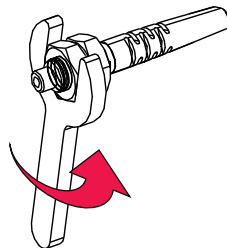
- not suitable for low temperatures
- larger bending radius
- higher material and production costs

General information and notices

Fiber optics structure / designations



- ① Sleeve length
- ② Probe
- ③ Fiber length
- ④ Bending protection (only KFX)
- ⑤ Fiber optic outer diameter

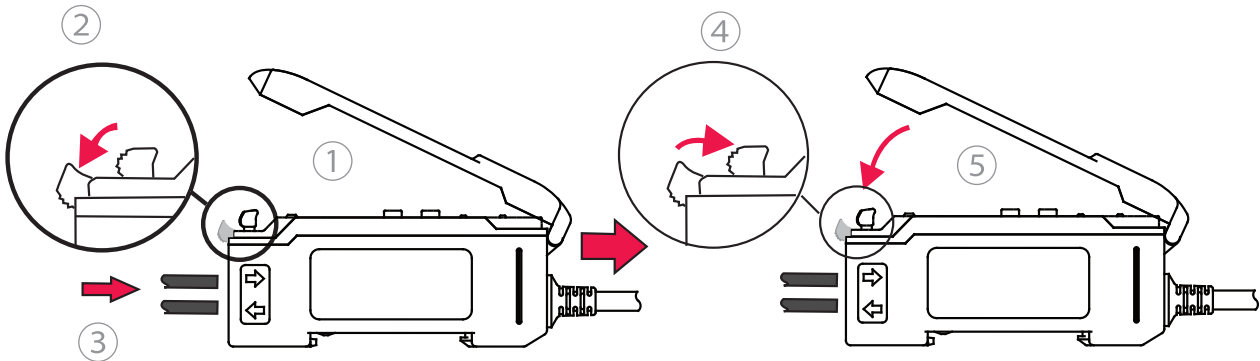


Mounting

Thread on probe	Nut tightening torque
M3	max. 0.78Nm
M4	max. 0.78Nm
M6	max. 0.98Nm

We reserve the right to make changes • FOS_ABC_EN.fm

Install fiber optics on the amplifier (example KF/KFX series)



- ① Open the transparent protective cover.
- ② Push down the lever of the fiber optic clamp to open.
- ③ Lead the **KF/KFX** type fiber optics in completely as far as they will go (ca. 12mm deep) into the fiber optic intake.
When doing so, observe the transmitter/receiver assignment on the amplifier (transmitter on bottom / receiver on top).
- ④ Pull up the lever of the fiber optic clamp to close.
Check if the clamp is secure by pulling lightly on the fiber optics.
- ⑤ Close the transparent protective cover.

Shorten fiber optics

Plastic fiber optics which do not have metal sleeves on the light inlet side can be shortened to any length. Fiber optics which can be shortened are always delivered with a suitable cutter/bending tool.



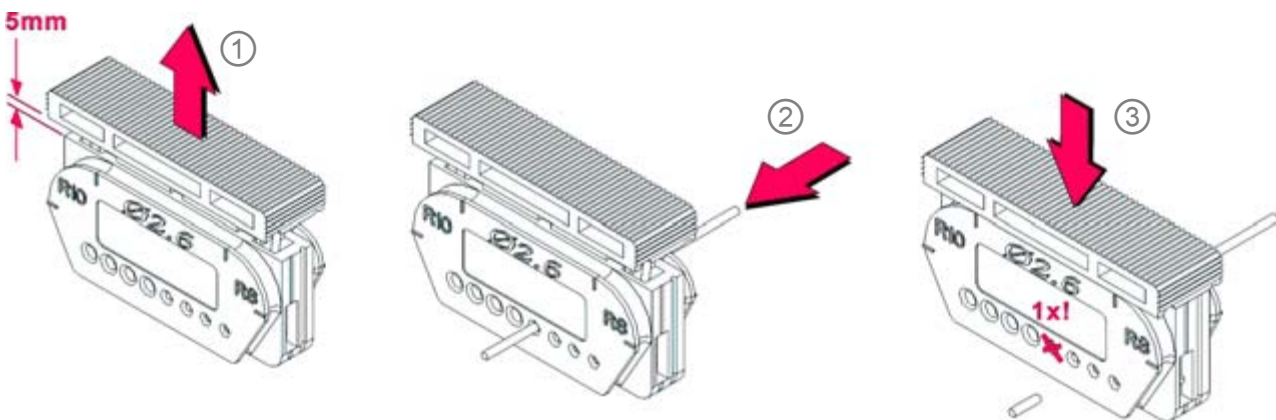
Attention!

To achieve an even cutting surface with low coupling loss, any cutting position can only be used once.



Notice!

For fiber optics with an outer diameter $\lt; \varnothing 2.2\text{mm}$ (e.g. $\varnothing 1.0\text{mm}$ or $\varnothing 1.3\text{mm}$), adapter sleeves are used. If these fibers are shortened, the sleeve must then be re-attached; otherwise the fiber optics cannot be clamped into the amplifier.

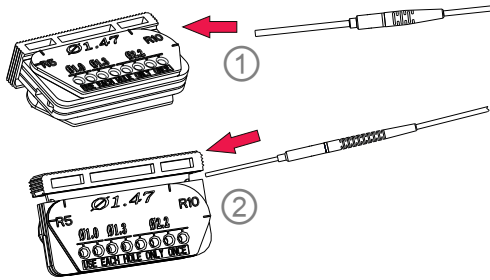


- ① Open the cutter/bending tool completely.
- ② Lead in fiber – when doing so, make sure the correct cross section is observed (designation on the tool)!
- ③ Close cutter/bending tool:
Press the brackets together with light pressure until the fiber is completely cut through.

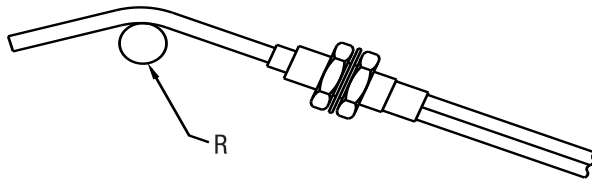
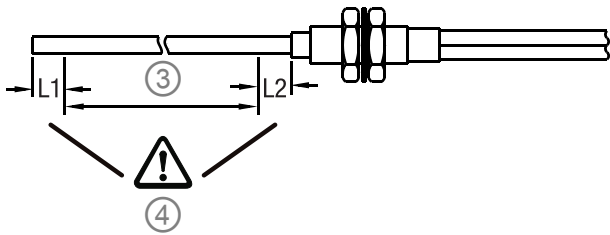
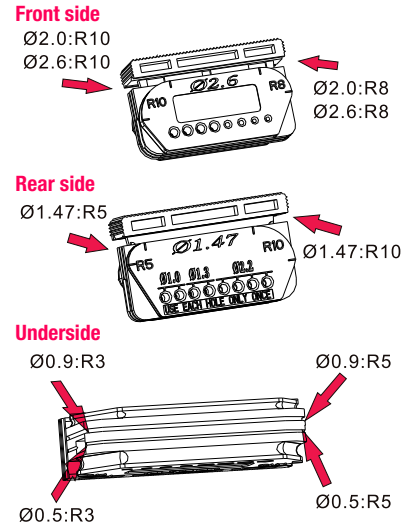
INSTALLATION

Bend fiber optics (KF/KFX series)

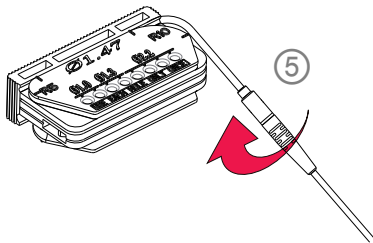
The cutter/bending tool included in delivery makes it easy to create a defined curve in long head sleeves. Depending on the diameter of the sleeves, the following bending radii are available for selection.



Sleeve diameter	Available bending radius
∅ 0.5mm	R3, R5
∅ 0.9mm	R3, R5
∅ 0.75mm	R5, R10
∅ 2.0mm	R8, R10
∅ 2.6mm	R8, R10

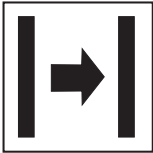


Bending radius R	Dimensions L1 ±1 mm	Dimensions L2 ±1 mm	Fiber type (throughbeam and scanner) see part number code on
R5	10mm	5mm	W, Y, Z, W2
	15mm	10mm	A, E
R10	15mm	10mm	S, D, S2
	20mm	20mm	J, T, H, B, X



- ① Select bending radius.
- ② Lead the sleeve into the bending tool.
- ③ Bendable area of the sleeve.
- ④ **Attention! Non-bendable areas of the sleeve** – observe L1 and L2 dimensions acc. to the table!
- ⑤ Bend the sleeve to the desired angle.

Throughbeam sensors



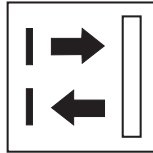
The system consists of 2 identical fiber optic cables which are aligned exactly in a mutually opposing manner.

One fiber optic cable is connected with the transmitter, the other with the receiver on the fiber optic amplifier. With throughbeam systems, the transmitter and receiver can be assigned in any manner.

Depending on the setting on the amplifier, a switching signal is produced when the light path is partially or fully shadowed.

Throughbeam systems has a large range, a high performance reserve and are characterized by excellent operational safety.

Diffuse reflection scanners



On the connector side (optical inlet), the system consists of two fibers which are merged on the head side (optical outlet).

The scanners function according to the energetic principle, i.e. the emitted light beam is reflected by the object surface to be detected and led through the fiber optics to the receiver in the amplifier.

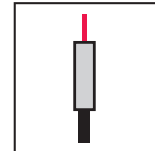
Bright, highly reflective surfaces achieve higher ranges in comparison to dark, poorly reflective surfaces.

For fiber optics with coaxial fiber structure, the connection to the fiber optic amplifier is done in a way that the transmitter fibers are in the center (observe the label on the fiber optics!).

Scanners with two adjacent fibers for the transmitter and receiver feature a switching behavior which depends on the entry direction. This results from the temporally differing shadowing effect when objects are moved into the light beam. To optimize the switching behavior, it may be necessary to switch the transmitter and receiver connections. A fiber sheathing is always labeled for identification purposes.

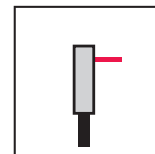
Optical outlet

On front:



The optical outlet on the head side of the fiber optics points in the direction of the fibers.

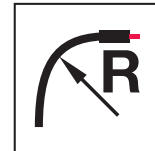
Lateral:



The optical outlet on the head side of the fiber optics points at a right angle to the direction of the fibers.

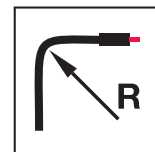
Laying

Flexible:



The active fiber core is composed of several thin single fibers. The minimum laying radius is **R = 2mm**.

Highly flexible:



The active fiber core is composed of many thin single fibers. The minimum laying radius is **R = 1mm**.

AREA OF APPLICATION

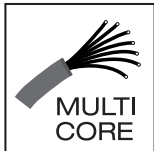
Fiber core

Active fiber diameter:

The light is lead through the active fiber cross section. The larger the cross section, the larger the operation or scanning range achieved.

Depending on the application, a smaller fiber cross section may be advantageous (→ Area of application).

Multiple fiber core:



The active fiber core is composed of several or many thin single fibers. This structure is what allows for a variety of features such as:

- fiber laying with very small laying radius (→ Laying).
- coaxial fiber configuration (→ Fiber core).
- surface detection (→ Area of application).

Multiple fiber cores are found in scanning and throughbeam systems.

Coaxial:



A coaxial fiber structure is only found in the scanning fiber optics.

One or several fibers are aligned in the center of the probe. The light from the transmitter is injected into the fiber(s). The fiber is equipped with a white label for easy identification.

Several fibers are configured around the transmitter fibers which lead the light from the object to the receiver on the fiber optic amplifier. The advantage of the coaxial configuration is that the detection behavior is independent of the entry direction of an object.

Area of application

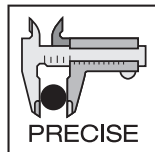
Standard applications:



The fiber optics with this label can be used for countless applications. If the specified operating range is observed, the scanners have a sufficient performance reserve and level of operational safety.

If, however, it is necessary to realize very precise object positioning or to detect very small objects, we recommend looking into using one of the following fiber types.

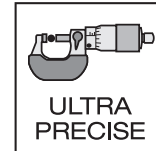
Precision applications:



These fiber optics have a smaller active fiber cross section than the standard fiber optics. This makes it possible to realize precise object positioning or the detection of parts with small cross sections.

However, the operating range which can be achieved is also reduced. Information on the smallest part detectable and the range that can be achieved can be found in our detailed data sheets.

High-precision application:

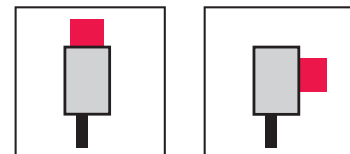


These fiber optics have an even smaller active fiber cross section than the fiber optics for precision applications.

This makes it possible to realize highly precise object positioning or the detection of parts with very small cross sections.

However, the operating range which can be achieved is also greatly reduced. Information on the smallest part detectable and the range that can be achieved can be found in our detailed data sheets.

Surface detection:



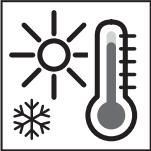
Small light curtains exist as through-beam system and scanner models.

Many individual fibers in the probe are configured side by side so that a continuous light-band is formed. Depending on the number of individual beams, the light-band has a higher or lower resolution.

These fiber optics can be used, for example, to sort small parts when passing through the light-band or to scan non homogeneous surfaces.

Special characteristics

Heat resistance:



For heat-resistant plastic fiber optics of the KF and KFX series, the maximum permissible operating temperature is +105°C. Depending on the sheathing material, the following values apply for GF glass fiber optics:

Brass:

-30°C ... +200°C

Stainless steel:

-30°C ... +200°C (for short periods +300°C)

Silicone:

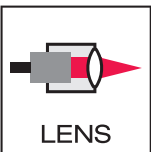
-30°C ... +180°C (for short periods +200°C)

Metal probe:



The probe is made of metal, e.g. nickel-plated brass or stainless steel. This enables permanent mounting, for example.

Adapted for attachment lens:



Some fiber optics can be equipped with an attachment lens.

In the case of KFX plastic fiber optics with metric thread, the lens is screwed on; in the case of GF glass fiber optics with cylindrical sleeve, the lens is affixed in accordance with regulations.

KFX plastic fiber optics:

Lenses for focusing the light beam are available for scanners, collimated lenses for increasing the operating range or performance reserve or for beam deflection by 90° are available for throughbeam systems (always use in pairs!).

GF glass fiber optics:

For throughbeam systems, lenses are available for increasing the operating range or for beam deflection by 90° (always use in pairs!).

+49 (0) 7021 573 0

Fiber length

Dimensions in [mm]:

For plastic fiber optics of the KF and KFX series, the length information refers to the total length of the fiber optics, i.e. fiber length (2000mm as a rule) plus probe length.

For the glass fiber optics of the GF series, the length information only refers to the fibers without the probe.

Fiber optics, can be shortened:



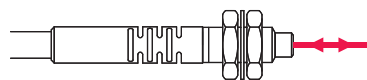
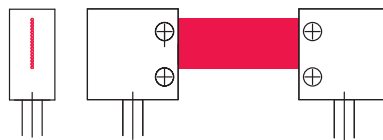
With a few exceptions, plastic fiber optics can be shortened on the light inlet side.

A cutter/bending tool is included in the delivery contents for this purpose.

Detailed information on this topic:
→ Shorten fiber optics

Fiber head configuration/ image

Principle images:



The simplified images with the most important selection criteria make selecting products quicker.

In the image, difference is made between the probe as well as the throughbeam system (above) and the scanner (below).

Typ. Operating range limit

On front:

LV463	900
LV462	525
LV461	300

The information on the typical scanning range limit for scanners refers to a white object with 90 % diffuse reflection.

The information on the operating range for throughbeam systems refers to an optimally aligned throughbeam path.

The table values are typical values and always refer to the maximum possible scanning or operating range.

The scanning or operating ranges are always dependent on the amplifier type used.

Attention!

Additional settings for sensitivity adjustments can be made in the menu for some amplifiers.

Due to tolerance-related fluctuations, we recommend complying with a safety factor of at least 20%. In addition we always recommend performing checks with several identical test items when carrying out application tests.

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