



INVERTER DRIVES PRODUCT RANGE

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Experience and Innovation

Since 1915 YASKAWA has manufactured and supplied products for machine building and industrial automation. Our standard products as well as tailor-made solutions are famous and have a high reputation for outstanding quality and reliability.

YASKAWA is the leading global manufacturer of inverter drives, servo drives, machine controllers, medium voltage inverters, and industrial robots.

We have always been a pioneer in motion control and drive technology, launching product innovations, which optimise the productivity and efficiency of both machines and systems.



Today we produce more than 1.8 million inverters per year. Considering this, YASKAWA is probably the biggest inverter manufacturer in the world.



Furthermore, with a yearly production of more than 800,000 servo motors and 20,000 robots we offer a wide range of products for drive automation processes in many different industries such as mining, steel, machine tools, automotive, packaging, woodworking, textiles and semiconductors. YASKAWA technology is used in all fields of machine building and industrial automation.

Wherever You Are – Our Local Support is Near.



Employing more than 14,600 people worldwide

More than 1,350 employees in worldwide service network

More than 1,250 employees in Europe

YASKAWA Drives - For Your Success



EXCELLENT PERFORMANCE

Our drives operate induction and permanent magnet motors, both with or without encoder feedback. No matter what type of configuration is chosen, by their top quality motor control YASKAWA drives improve machine performance and efficiency in many fields of application.



SMART PRODUCT DESIGN

YASKAWA drives are designed to simplify and optimise machinery. Just a few examples - dual rating provides the chance to use a one step smaller drive for the same motor, tasks of a simple PLC can be programmed into a drive with just some mouse clicks, gapless side-by-side mounting shrinks required panel space.



FUNCTIONAL SAFETY BUILT-IN

Built-in functional safety features help to easily increase machine safety. Additionally, replacing external safety devices by drive built-in functionality saves space, cost and increases machine reliability.



RELIABLE OPERATION

Quality and reliability has been our passion ever since. Drives designed for 10-years of maintenance free operation is just one expression of that. Our drives provide high overload capability and special functionality to reliably continue machine operation under unforeseen conditions and thus preventing machine stop and production loss.



QUICK AND EASY START-UP

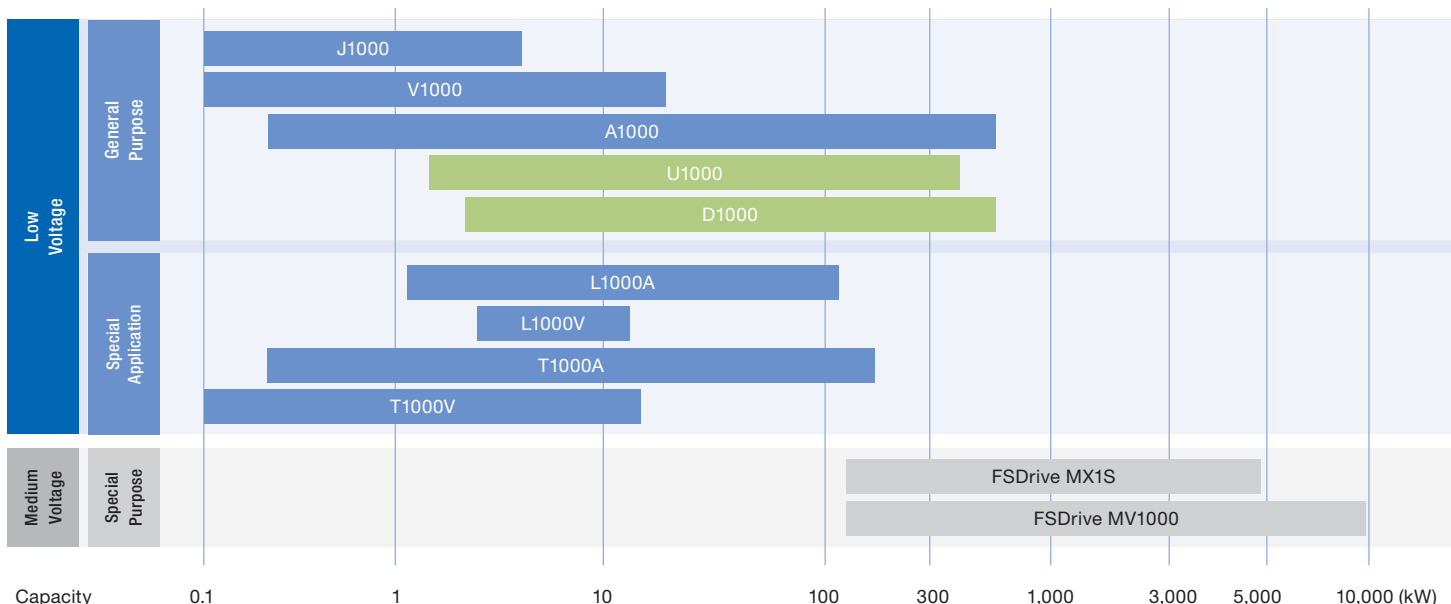
From automatic motor data tuning, through full text keypads in up to 13 languages down to application specific setup macros, YASKAWA drives provide various functions to shorten the setup to a minimum. All 1000 series drives share a common parameter structure, getting known to one YASKAWA drive means getting known to all of them.



ENVIRONMENTALLY FRIENDLY

All our drives are compliant with current environmental regulations such as RoHS. With energy-saving focused motor control technology including the use of permanent magnet motors YASKAWA drives help to reduce energy consumption and CO₂ emission.

INVERTER SERIES



Drive Selector

1 phase		3 phase				Applicable motor Max. output [kW]	Induction motor (IM)	Permanent magnet motor (PM)	Enclosure	Drive model	
230 V AC	200 V AC	400 V AC	3300 V AC	6600 V AC	11000 V AC						
Standard Inverter Drives											
●						0.1 - 2.2			IP20 Finless types	J1000 Compact Drive	
	●					0.1 - 5.5	●	-			
		●				0.2 - 5.5			IP20, NEMA1, IP66 Finless types	V1000 Versatile Drive	
●						0.1 - 4.0					
	●					0.1 - 18.5	●	●	IP00, IP20, IP54, IP54 ready, NEMA1, Floor standing type	A1000 Multi-purpose Drive	
		●				0.2 - 18.5					
	●					0.55 - 110	●	●	IP20	L1000A Lift Drive	
						0.55 - 630					
	●					1.5 - 45	●	●	IP20, NEMA1	L1000V Lift Drive	
		●				1.5 - 110					
	●					4.0 - 15	●	-	IP00, IP20, NEMA1 Fineless types	T1000A Textile Drive	
		●				4.0 - 15					
	●					0.55 - 110	●	●	IP00, IP20, NEMA1 Fineless types	T1000V Textile Drive	
						0.55 - 185					
●						0.1 - 3.0			IP20, NEMA1 Finless types	T1000V Textile Drive	
	●					0.1 - 18.5	●	●			
		●				0.2 - 18.5					
Energy Saving Units											
	●					5.0 - 130		-	IP00	D1000 Regenerative Converter Unit	
						5.0 - 630					
	●					5.5 - 55	●	●	IP00, IP20	U1000 Regenerative Matrix Converter	
		●				2.2 - 450					
Medium Voltage Inverter Drives											
			●			132 - 2,500	●	-	Vertical Floorstanding Panel type	FSDrive MX1S Medium Voltage Matrix Converter	
				●		250 - 5,000					
			●			132 - 3,000			Vertical Floorstanding Panel type	FSDrive MV1000 Medium Voltage Drive	
				●		250 - 6,000	●	●			
					●	530 - 9,910					

● Standard ○ Optional - not available

Key features	Drive applications
<ul style="list-style-type: none"> ▶ Extremely compact ▶ Minimum number of settings; application macros for quick and easy setup ▶ Drives one size larger motors by dual ratings (HD/ND) ▶ Braking chopper built-in 	<p>J1000 is the right drive for low power, simple variable speed applications like fans, pumps, conveyors, small hoists, drills and many others.</p>
<ul style="list-style-type: none"> ▶ Open loop control of IM and PM motors with auto-tuning function ▶ Highly flexible I/Os and optional fieldbus connection ▶ PLC functionality built-in ▶ IP66, finless versions available, Functional safety built-in 	<p>V1000 is a compact all-rounder made to run any application from simple pumps and fans to more demanding hoists, compressors. Efficiency driven applications can greatly benefit from energy saving control and PM motor drive.</p>
<ul style="list-style-type: none"> ▶ High performance control of induction and PM motors with and without encoder feedback. ▶ Functional safety built in ▶ Extendable with various I/O and fieldbus options ▶ Available in IP54 as wall mount or panel for wet and dirty environment 	<p>A1000 satisfies almost any application from simple pumps and fans up to compressors, extruders, cranes, complex winder control, precise positioning and other demanding applications. The GL certification allows for marine use.</p>
<ul style="list-style-type: none"> ▶ Top ride quality and accuracy for geared and gearless induction and PM machines ▶ Flexible I/Os for connection to any controller ▶ Easy Setup with lift terminology in 13 languages and motor tuning in stand still condition ▶ One motor contactor / motor contactor-less operation ▶ A3 Brake monitoring built in 	<p>L1000A provides top ride performance for any kind of elevator, no matter if modernisation or new installation. The simple parameter structure, the full text LCD display and the simple tuning of quite any motor provide a running lift in shortest time.</p>
<ul style="list-style-type: none"> ▶ Powerful but extremely compact ▶ Smooth and precise control of induction motors ▶ Built in brake control sequence, automatic evacuation in light direction and other valuable lift functions built in ▶ Motor tuning in stand still without removing ropes 	<p>L1000V is a cost-effective solution for modernisation of single- or two-speed elevators but also for new installation of geared lifts without motor encoder feedback.</p>
<ul style="list-style-type: none"> ▶ Special textile functionality like traverse, advanced power loss handling, master-slave ▶ Open and closed loop control of induction and PM machines ▶ Special protection against dust, humidity and chemicals ▶ Cold plate version available 	<p>T1000A is ideal for Textile machinery. With high performance motor control, built in textile functionality and special hardware protection it is a drive for any stage of textile production process.</p>
<ul style="list-style-type: none"> ▶ Ultra-compact ▶ Precise open loop control of induction and PM motors ▶ Special protection against dust, humidity and chemicals ▶ Cold plate version available 	<p>T1000V is the compact companion of T1000A, perfect for all open loop motor control tasks in textile machinery. Small dimensions make it fitting to any panel.</p>
<ul style="list-style-type: none"> ▶ Converter unit for 4Q-applications ▶ Energy saving by braking power regeneration ▶ Low harmonics input current and power factor 1 ▶ DC boost function for stable DC voltage 	<p>D1000 is a regenerative supply for single drives or common DC-bus setups in lifts, escalators, cranes and other applications where power regeneration, energy saving, low harmonics or unity power factor are a requirement.</p>
<ul style="list-style-type: none"> ▶ Fully regenerative Drive with built in EMC filter and functional safety ▶ Latest Matrix converter technology with low harmonics input current and unity power factor ▶ Ultra compact size ▶ Easy installation, no external components 	<p>U1000 is the perfect match for single motor drive applications with requirements to power regeneration and low harmonics such as lifts, escalators, HVAC machinery, hoists, centrifuges and many others.</p>
<p>FSDrive-MX1S uses matrix converter technology and combines highly efficient operation of medium voltage motors with low harmonics power regeneration.</p> <ul style="list-style-type: none"> ▶ No DC bus capacitors ▶ AC to AC conversation ▶ Regenerative converter (4Q) 	<p>The MX1S is perfect for rolling mills, conveyors, descaling pumps, roll cooling water pumps, sewage pumps, drain pumps, incinerators, boilers IDF, test facilities and ladle crane main hoists.</p>
<p>FSDrive-MV1000 is the smallest air-cooled multi-level inverter drive in the world. It's compactness, performance and energy efficiency make it the first choice for cost effective medium voltage solutions.</p> <ul style="list-style-type: none"> ▶ Perfect drive for existing and new installations ▶ Highest MTBF in the market 	<p>The MV1000 performs best in applications with all kinds of pumps, fans, blowers and compressors, but also with mills, test facilities, grinders, kiln drives, exhausters, crushers and extruders.</p>

Specifications

	J1000	V1000	A1000	L1000A	L1000V
					
Max. motor output					
1 phase	230 V AC 0.1 - 2.2 kW	230 V AC 0.1 - 4.0 kW	-	-	-
3 phase	200 V AC 0.1 - 5.5 kW 400 V AC 0.2 - 5.5 kW	200 V AC 0.1 - 18.5 kW 400 V AC 0.2 - 18.5 kW	200 V AC 0.4 - 110 kW 400 V AC 0.4 - 630 kW	200 V AC 1.5 - 45 kW 400 V AC 1.5 - 110 kW	200 V AC 5.5 - 15 kW 400 V AC 4.0 - 15 kW
Applicable motor					
Induction motor with/without encoder	-/●	-/●	●/●	●/●	-/●
Permanent magnet motor with/without encoder	-/-	●/-	●/●	●/●	-/-
Cooling method					
Air-cooling	●	●	●	●	●
Cold-plate	●	●	-	-	-
Torque control	-	-	●	-	-
Braking chopper built-in	●	●	●	●	●
Max. output frequency	400 Hz	400 Hz	● 400 Hz / ○ 1000 Hz	200 Hz	120 Hz
I/O built-in					
Analog input/output	1/1	2/1	3/2	2/2	-/1
Digital input/output	5/1	6/3	8/4	8/6	7/3
Speed feedback (encoder)	-	-	○	○	-
Motor thermal protection	●	●	●	●	●
STO (Safe-torque off)	-	●	●	●	●
Fieldbus					
RS-422/485 (Memobus/Modbus)	○	●	●	●	-
RS-232C	○	●	●	●	●
Mechatrolink-I / Mechatrolink-II	-	○	○	-	-
Ethernet/IP	-	○	○	-	-
EtherCAT	-	○	○	-	-
Modbus TCP	-	○	○	-	-
Profinet	-	○	○	-	-
OC-Link	-	○	○	-	-
DeviceNet	-	○	○	-	-
Profibus-DP	-	○	○	-	-
CANopen	-	○	○	○	-
Powerlink	-	○	○	-	-
Functions					
Energy saving	●	●	●	-	-
Double rating (ND/HD)	●	●	●	-	-
Low harmonics (THDi < 5%)	-	-	-	-	-
Four quadrant operation	-	-	-	-	-
Speed search	●	●	●	-	-
PID control (with sleep function)	-	●	●	-	-
Momentary power loss ride-thru	●	●	●	-	-
Application parameters presets	●	●	●	-	-
Preventive maintenance functions	-	●	●	●	●
USB interface	○	○	●	●	-
Coated PCB	-	-	-	-	-
Battery rescue operation / UPS	-	-	-	●	●
External 24 V supply	-	○	○	○	○
DriveWorks EZ (PLC SW)	-	●	●	-	-
Functional safety options					
Safe-torque off (SIL2/PL d)	-	●	●	●	●
Safe-torque off (SIL3/PL e)	-	-	-	○	-
Standards					
CE / RoHS	●/●	●/●	●/●	●/●	●/●
UL/cUL / UL508C	●	●	●	●	●
Marine (GL)	-	-	●	-	-

● Standard ○ Optional ▲ With inverter only ◀ For CLV ● PLC built in ▽ With PLC only - Not available

T1000A	T1000V	FSDrive MX1S	FSDrive MV1000	D1000	U1000
					
-	230 V AC 0.1 - 3.0 kW	-	-	-	-
200 V AC 0.55 - 110 kW 400 V AC 0.55 - 185 kW	200 V AC 0.1 - 18.5 kW 400 V AC 0.1 - 18.5 kW	3,300 V AC 132 - 2,500 kW 6,600 V AC 250 - 5,000 kW	3,300 V AC 132 - 3,000 kW 6,600 V AC 250 - 6,000 kW 11,000 V AC 530 - 9,910 kW	200 V AC 5.0 - 130 kW 400 V AC 5.0 - 630 kW	200 V AC 5.5 - 55 kW 400 V AC 3.9 - 500 kW
●/● ●/●	●/- ●/-	●/● -/-	●/● ●/-	-/- -/-	●/● ●/●
-	-	●	●	●	●
○	○	-	-	-	-
●	-	○	●	-	●
○	●	n/a	-	-	-
400 Hz	400 Hz	120 Hz	120 Hz	400 Hz	400 Hz
3/2	2/1	1/2	1/2	3/2	3/2
8/4	6/3	7/4	4/5	8/4	8/4
○	-	○	○	-	○
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-	-	-	○	-	-

*1 Available soon *2 Only Open Loop Vector Control *3 Open-Loop: 1:1000 *4 Contact YASKAWA for more information

A1000 - The High Performance Inverter for Any Purpose

The YASKAWA A1000 Inverter provides remarkable advantages through excellent motor drive performance, environmental benefits and energy savings as well as many user orientated operational features.



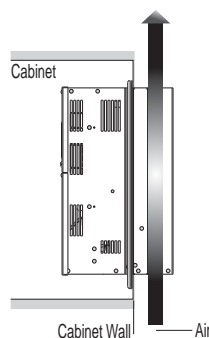
- ▶ Excellent motor drive performance - A1000 is a premium inverter drive running induction motors and also PM motors in open and closed loop mode with full torque at zero speed
- ▶ Full text display (13 languages) and automatic motor tuning for easy and time-saving start-up
- ▶ Encoder interfaces and I/O interfaces for higher flexibility
- ▶ Dual rating (HD/ND)
- ▶ Functional Safety integrated (STO, SIL2, PL-d)
- ▶ Easy integration of PLC functionality with DriveWorksEZ engineering platform
- ▶ Outstanding reliability with long life design for 10 years of maintenance free operation
- ▶ Solutions for positioning, high output frequency applications, winder, electronic line shaft, cranes

A1000 IP54 Ready



The IP54 Ready drives are the optimal solution for small sized custom panels with high degree of ingress protection.

- ▶ Heatsink out of the back mounting with IP54 sealed mounting flange brings main heat loss out of the panel and allows smaller panel dimensions
- ▶ Easy out of the box installation of single and multiple drives in an IP54 panel



A1000 IP54 Wall Mount



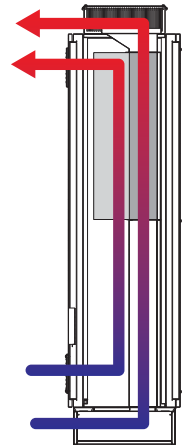
The IP54 Wall Mount drives are made for decentralized installation.

- ▶ A1000 in IP54 compact panel with door mounted LCD keypad
- ▶ No extra panel, simple installation to machines or rooms
- ▶ Space for additional components allows customization
- ▶ EMC filter built in, IT grid filter optional
- ▶ Mains switch optionally built-in

A1000 IP23/IP54 Floor Standing Panel

Configured according to customer requirements and installed in the control cabinet the drive system is instantly ready for use.

- ▶ **Reliable**
Thermally, mechanically and electronically tested (LVD/EMC), no need for customer tests
- ▶ **Time saving**
Easy procurement, fully pre-assembled and ready for wiring, fast commissioning and setup
- ▶ **Flexible**
Customizable to customer needs and open for new options
- ▶ **Simple**
Complete working system from one supplier, only one partner for service and support
- ▶ **Innovative**
Separate air ducts for power section and control section ensure optimal cooling and reduce impurification of electronic parts



EMC filter

Communication options

Power options input
Fuse protection or automatic line circuit breaker

Power options output
For EMC compliance

Braking option

I/O and speed feedback option

Customised option bay
For customer specific extensions like PLC, power supply...

Fully configurable to customer needs
Ready to use. No tests. No configuration.

Applications

The YASKAWA A1000 Inverters can be used in a broad range of applications - even in harshest environment.



A1000 ▶ Extruders ▶ HVAC ▶ Conveyors

V1000 - The Compact and Powerful Inverter Drive

YASKAWA V1000 is a general purpose inverter drive covering the demands of a wide field of applications including Open-Loop-Vector functionality and the usage of PM motor without feedback.



- ▶ Drives induction motors and also permanent magnet motors in open loop control
- ▶ Overload of 150% / 1 minute for heavy duty applications. Operates one size larger motor in normal duty
- ▶ Functional Safety integrated (STO, SIL2, PL-d)
- ▶ Easy integration of PLC functionality with DriveWorksEZ engineering platform
- ▶ Energy-saving control and operation of highly efficient PM motors for optimized machine efficiency
- ▶ Auto-tuning function and simple parameter structure for easy and time-saving start-up
- ▶ Space saving and compact design - side-by-side mounting possible
- ▶ Outstanding reliability with long life design for 10 years of maintenance free operation

V1000 IP66

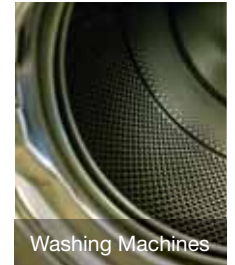
Decentralized solution for variable speed and simple positioning applications without cabinet with the proven reliability of the V1000 Inverter. Perfect for wet and dusty working environments that are cleaned with water streams.

- ▶ Available in two enclosure versions
 - Built-in large LED operator panel for best readability and handling with gloves
 - Blank face plate, RJ45 connector for external operator connection
- ▶ No need for costly enclosures against dust, water, oil or other environmental stress
- ▶ Easy installation and wiring
- ▶ Additional accessories find their place within the enclosure
- ▶ Integrated class C1 EMC filter



Applications

The YASKAWA V1000 Inverter Drives can be used in a broad range of applications - the compact and powerful design helps reducing the size of the whole machinery and maintain reliable operation on outstanding performance.



V1000 ▶ HVAC ▶ Water treatment ▶ Ceramic market

J1000 - The Easy Inverter Drive

The J1000 meets all automation requirements for compact applications with variable speed operation and energy saving characteristics. It's just unpacking, plugging in and everything runs smooth.



- ▶ Ultra-compact size inverter drive running induction motors
- ▶ Fast stop without braking resistor with overexcitation braking
- ▶ Boost function detects load and automatically adjusts torque
- ▶ Operates one size larger motor in normal duty
- ▶ Speed search function for smooth start-up of coasting motors
- ▶ Braking resistor built-in
- ▶ Space saving and compact design
- ▶ Easy and time-saving start-up
- ▶ Outstanding reliability with long life design for 10 years of maintenance free operation

Applications

The J1000 drives are our easy plug-and-play solution for energy saving motor control in several applications.



J1000

L1000 - Lift Solutions

YASKAWA L1000 Lift Drives are the solution to technical requirements of today's elevators and come equipped with intelligent elevator functionalities and outstanding performance. Experience the proven YASKAWA reliability combined with a new level of ride comfort.

Features

- ▶ Integrated lift functions, such as brake control, motor contactor control, short floor ride
- ▶ Automatic evacuation in light direction allows smaller UPS or battery
- ▶ One motor contactor solution according to EN81 reduces cost and increases reliability
- ▶ High performance motor control for shock-free starts, smooth rides and accurate stops
- ▶ Simple I/Os allow connection to almost any other lift controller
- ▶ Motor data auto-tuning in standstill condition without removing ropes (L1000A: also supports PM motors)

L1000A

- ▶ Drives induction and PM motors, with and without speed feedback, geared and gearless
- ▶ Programming in Lift terminology and 13 languages
- ▶ A3 brake monitoring and DCP3
- ▶ Incremental, Endat, Hiperface, SinCos and Resolver feedback
- ▶ SIL3 STO for contactorless operation to come
- ▶ CANopen Lift and DCP4 to come



L1000V

- ▶ Smallest lift drive available on the market saves space and cost on panel design
- ▶ Sensorless control of geared induction motors with precise slip compensation for best stop accuracy
- ▶ Lift term programming in 8 languages with optional full text LCD keypad



Lift Packages with Inverters & Motors

The motors MSYP-160 and MSYP-200 for gearless lifts together with L1000A inverters are the ideal solution for machineroom-less lifts.

Up to 2500 kg with a speed of 2 m/s

- ▶ Perfect match for the chosen motor and lift application
- ▶ Reliable operation
- ▶ One supplier, one order, one shipment, one guarantee



T1000 - Textile Solutions

A complete power range from 0.1 kW to 185 kW is available with standard and specific functionality to cover the application requirements of the textile machine industry. The T1000 Inverter Series has been developed with focus on reliable operation, easy handling and overall cost savings.

Features

- ▶ Finless and fanless design - Heat sink and cold plate versions for water cooler mounting available and no built-in fans
- ▶ PCB coating suitable for textile production — for highest reliability in typical textile applications
- ▶ Traverse function — for optimised yarn winding
- ▶ Power loss ride-through function — safe operation status at all times, including for synchronised drives with shared DC link
- ▶ Outstanding reliability with long life design for 10 years of maintenance free operation

T1000A



- ▶ Pulse Train Output and Pulse Train speed reference — easy and effective synchronised line speed
- ▶ High precision open- and closed loop control of induction and permanent magnet motors

T1000V



- ▶ Sensorless control of induction and permanent magnet motors
- ▶ Compact design up to 18.5 kW
- ▶ Single phase available

Applications

The T1000 drives are perfectly protected from dust and other pollution - for any application in the textile industry.



Spinning



Winding



Washing



Weaving



Fiber Preparation

T1000

FSDrive - Compact Medium Voltage Inverter Drives

The YASKAWA FSDrive series with its models MV1000 and MX1S are outstanding medium voltage inverter drives that combine their compact design with performance and energy efficiency.

FSDrive-MV1000

FSDrive-MV1000 is equipped with newest technology. It's compactness, performance and energy efficiency make it the first choice for cost effective medium voltage solutions.

- ▶ Ultra compact design minimizes mounting space and saves installation and shipping cost
- ▶ Efficiency of ~97% (output/input including transformer) reduces losses to a minimum
- ▶ Power cell concept with multi-level technology keeps input current harmonics low while providing sinewave output voltage without any external filter
- ▶ User-friendly interface identical to the 1000 series low voltage drives, for simple operation, adjustment, and maintenance
- ▶ Equipped with functions unaffected by fluctuations in power supply and load.

FSDrive-MX1S

FSDrive-MX1S uses matrix converter technology and combines highly efficient operation of medium voltage motors with low harmonics power regeneration.

- ▶ Dynamic operation at variable speeds for quick respond sudden speed changes as well as regenerative operation
- ▶ Full torque at zero speed
- ▶ Enhanced trace function and LAN compatibility for easy monitoring operation status, protective maintenance and quick intervention
- ▶ Capacitor-free main circuit for reduced maintenance
- ▶ High efficiency ~98% and high power factor >0.95 for reduced energy consumption
- ▶ Minimized torque ripple for smooth mechanical operation



One Step Ahead!

Saving energy has never been easier. The SPRiPM package consisting of a super-efficiency PM motor and a matching inverter drive, exceeds the efficiency demands according to IE4 (IEC/TS 60034-31) and thus helps machine manufacturers to fulfill the ErP directive of 2017 already today.

Features

- ▶ Extremely compact and space saving - Smaller than standard IE2 motors and even smaller than most IE4 motors in the market
- ▶ Supremely efficient for lower operating costs for fast pay off - Best of class energy efficiency reduces energy consumption drastically
- ▶ Environmentally friendly with less CO₂ emissions - Exceeds efficiency requirements of the highest class IE4 according to IEC/TS 60034-31 (super premium efficiency)
- ▶ Highly robust and resistant - System without encoder for use even in harsh environments
- ▶ Simply plug and play - Pre-configured inverter drives for easy installation and setup of the whole package



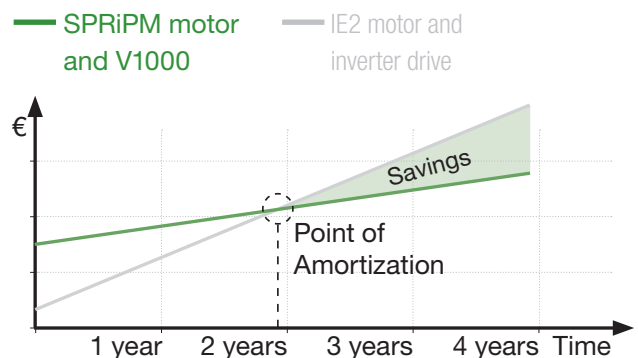
The Advantage of the SPRiPM package

Even if the package of SPRiPM motor and A1000 or V1000 inverter drive causes slightly higher initial costs than a solution with IE2 motor and inverter drive, the SPRiPM drive package pays for itself within a stunningly short time in a broad range of applications. Very often already within less than 2 years. From this point of amortization the SPRiPM drive package saves a proper amount of money.

Pays for itself in
**less than
2 years**

Calculation Example

Motor Power	4.0 kW
Rated Speed	3000 rpm
Average Load	85%
Operating Hours	16 hours a day, 5 days a week, 45 weeks a year = 3600 h
Energy Costs	0.13 €/kWh
Power Consumption IE2	14,266 kWh
Power Consumption SPRiPM	13,540 kWh



Energy Regenerative Units for all Purposes Reduce Energy Costs and Protect the Environment

With the D1000 Regenerative Converter unit and the U1000 Matrix Converter, YASKAWA provides solutions that help to significantly reduce energy consumption by feeding back braking energy to the power grid. This cuts down costs dramatically and allows a power-grid friendly operation.

Common Features

Power-grid friendly operation with minimized losses

- ▶ Sinusoidal input current with unity power factor
- ▶ Reduces losses in transformers and lines
- ▶ Lowers potential interferences with other components

Requires less maintenance work than systems with braking resistors

Power regeneration to save energy

- ▶ Provides energy to other consumers
- ▶ No heat dissipation in braking resistors
- ▶ Less cooling required for the switch cabinet
- ▶ Saves energy and reduces costs

Designed for 10 years of maintenance-free, reliable operation

D1000 Regenerative Converter Unit

The D1000 regenerative converter unit saves energy and space. Suitable for both regenerative individual drives and systems of inverter drives, servo axes or robots, the D1000 feeds excess braking energy back into the grid instead of converting it into heat. The DC voltage boost function increases system reliability, even with different or fluctuating input voltages.

- ▶ Stable DC bus voltage
- ▶ DC boost
- ▶ Very low harmonics
- ▶ Cool operation
- ▶ Ideal for common DC-bus applications



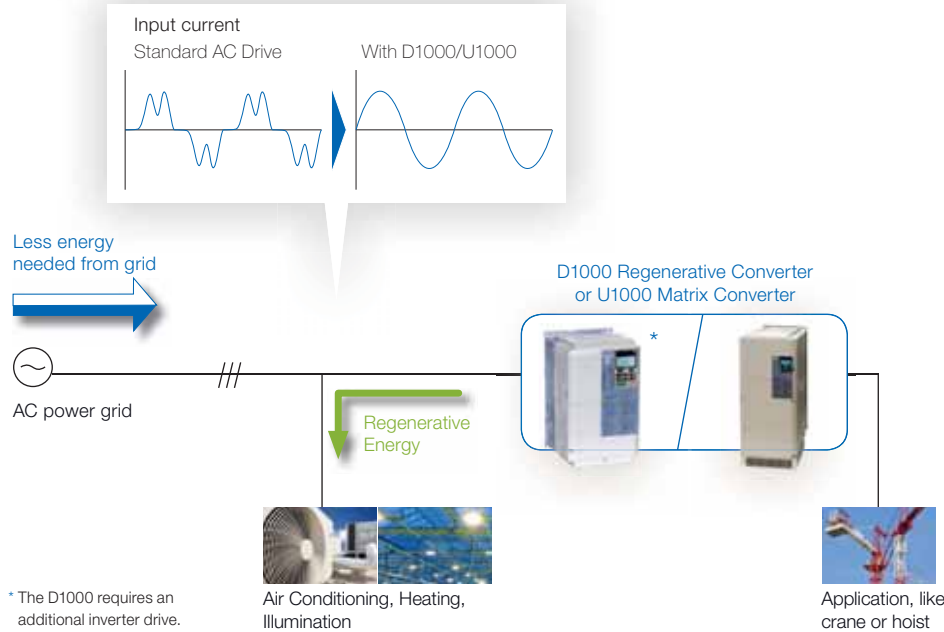
U1000 Matrix Converter

The YASKAWA Matrix Converter is an energy-saving inverter without DC-bus. Regenerative braking energy is fed back into the power grid, while sinusoidal input current reduces losses and allows a power-grid friendly operation.

- ▶ Precise control of induction and permanent magnet motors with or without encoders
- ▶ Highly efficient direct AC-to-AC conversion
- ▶ Very compact design
- ▶ Ultra-low harmonics
- ▶ Simple wiring and auto-tuning function for easy and fast installation
- ▶ Functional safety built-in (STO, SIL3)
- ▶ EMC filter built-in, no external components like reactors required



Find the Perfect Energy Saver for Your Applications



Pick the solution that perfectly fulfills the needs of various kinds of applications.

Drive model	D1000	U1000
Energy Saving by Power Regeneration	●	●
Motor Drive	—	●
Improve Power Factor	●	●
Suppress Input Current Harmonics	●	●
DC Voltage Boost	●	—
Multiple Drives	●	—
Simple Wiring	—	●
Downsize Panel	○	●

Applications

The D1000 and the U1000 units of YASKAWA can be used in several applications. Depending on the details of the application, either one of the devices fits perfectly.



D1000 ▶ Elevator and escalator groups ▶ Winders ▶ Fans ▶ Pumps ▶ Compressors



U1000 ▶ Cranes and Hoists ▶ Elevators and Escalators ▶ Centrifugal separators

Software Tools for YASKAWA Inverter Drives

DriveWizard Plus for easy Engineering

Manage the unique settings for all your drives right on your PC. An indispensable tool for drive setup and maintenance. Edit parameters, access all monitors, create customized operation sequences, and observe drive performance with the oscilloscope function.



- ▶ Convenient PC-based drive-setup, monitoring and diagnostic functions
- ▶ Built-in scope function
- ▶ Automatic parameter conversion from older series drives
- ▶ Online and offline parameter editing

DriveWorksEZ for easy Installation and reliable Operation

DriveWorksEZ® adds programmable functions that can tailor the V1000 and A1000 Series drives to the machine without the help of external controllers such as a PLC. This provides the user with easy access to the power of the inverters through an icon-based, graphical programming environment.



Benefits

- ▶ PLC or other controllers not necessary
- ▶ Easy to use
- ▶ Fast and constant scan cycles
- ▶ Flexible
- ▶ On-line monitoring
- ▶ Process control

Example projects



Economically optimized water skiing facility

- ▶ No additional I/Os necessary
- ▶ No PLC required - reduced the system cost to less than 50% of the initial estimate



Highly precise positioning

- ▶ Direct access to encoder pulses
- ▶ User-defined units and monitors

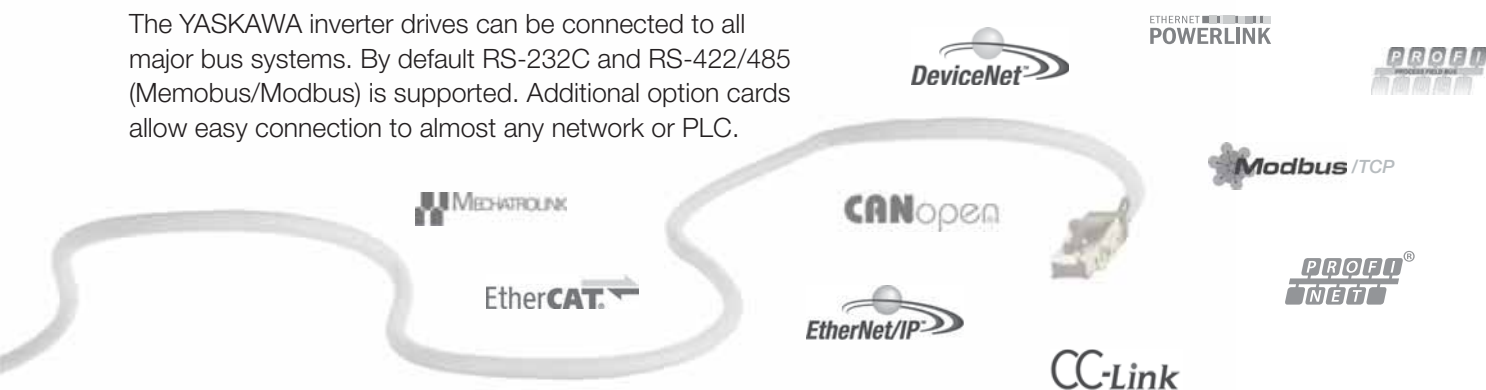
Further examples:

- ▶ Efficient Brake Sequence
- ▶ Unbalance Detection in Washing Machines

Options and Accessories

Fieldbus Options

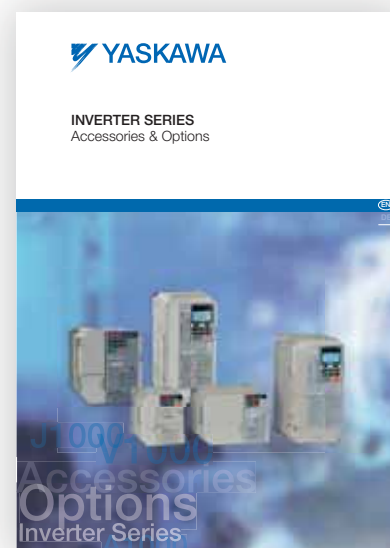
The YASKAWA inverter drives can be connected to all major bus systems. By default RS-232C and RS-422/485 (Memobus/Modbus) is supported. Additional option cards allow easy connection to almost any network or PLC.



Customizable with Options and Accessories

YASKAWA provides a lot of different accessories and options. In addition to drives, YASKAWA provides all major options and accessories needed in systems, be it for standards compliance, connectivity or protective design.

- ▶ AC Input Reactors
- ▶ EMC Filter - standard and also for IT grid
- ▶ Reactors for Lift and Escalator Applications
- ▶ Harmonic Filter
- ▶ Sine Wave Output Filter
- ▶ Operator Panels either as 8-segment LED operator or as full text LCD keypad with support for 13 languages
- ▶ 24 V Control Power Supply
- ▶ USB Copy Unit
- ▶ Communication Option Cards
- ▶ I/O Option Cards
- ▶ Speed Feedback Option Cards
- ▶ Mechanical Options to improve protection level of the inverter drive
- ▶ Braking Options
- ▶ Motor Reactors



Find all the options in the brochure „Inverter Series - Accessories & Options“. Available online or as printed version.



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