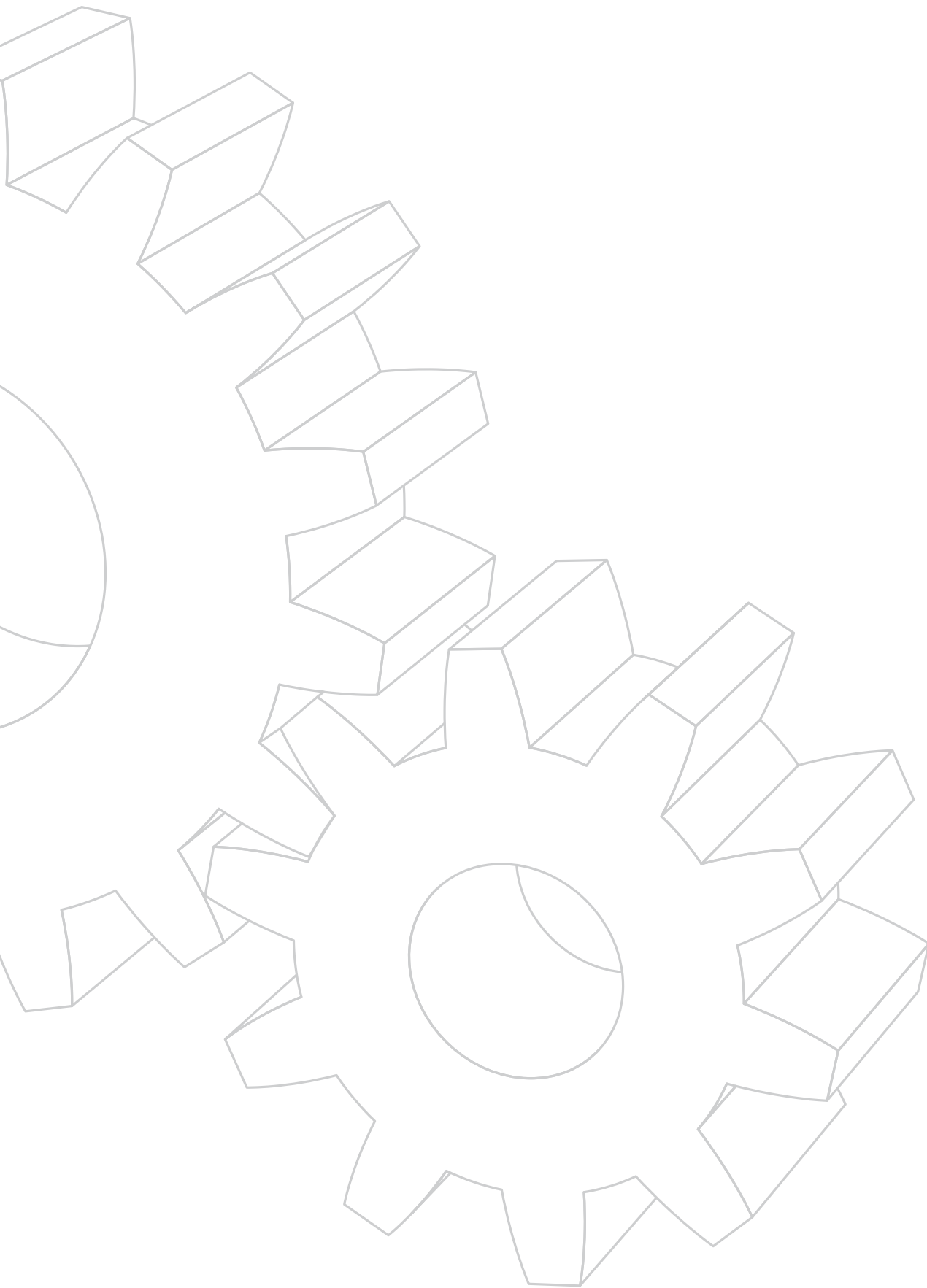




Keeps your machinery running!



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1000 Series New Product and Operational Benefits

Cost Saving

- Reduced mounting space because of small design and Side- by- Side Mounting
- Performance Life Monitor informs about parts wear and tear (IGBT, cooling fan, capacitors)
- Dual Rating –One frame size smaller drive can run an application with low overload characteristics
- PM motor control
- Rotational and stationary Autotuning for induction & synchronous motor
- International Standards (CE, UL/ cUL, ROHS, UL508C, EN954-1 safe category 3, stop category 0, EN ISO 13849-1 PLd, IEC/ EN61508 SIL2)

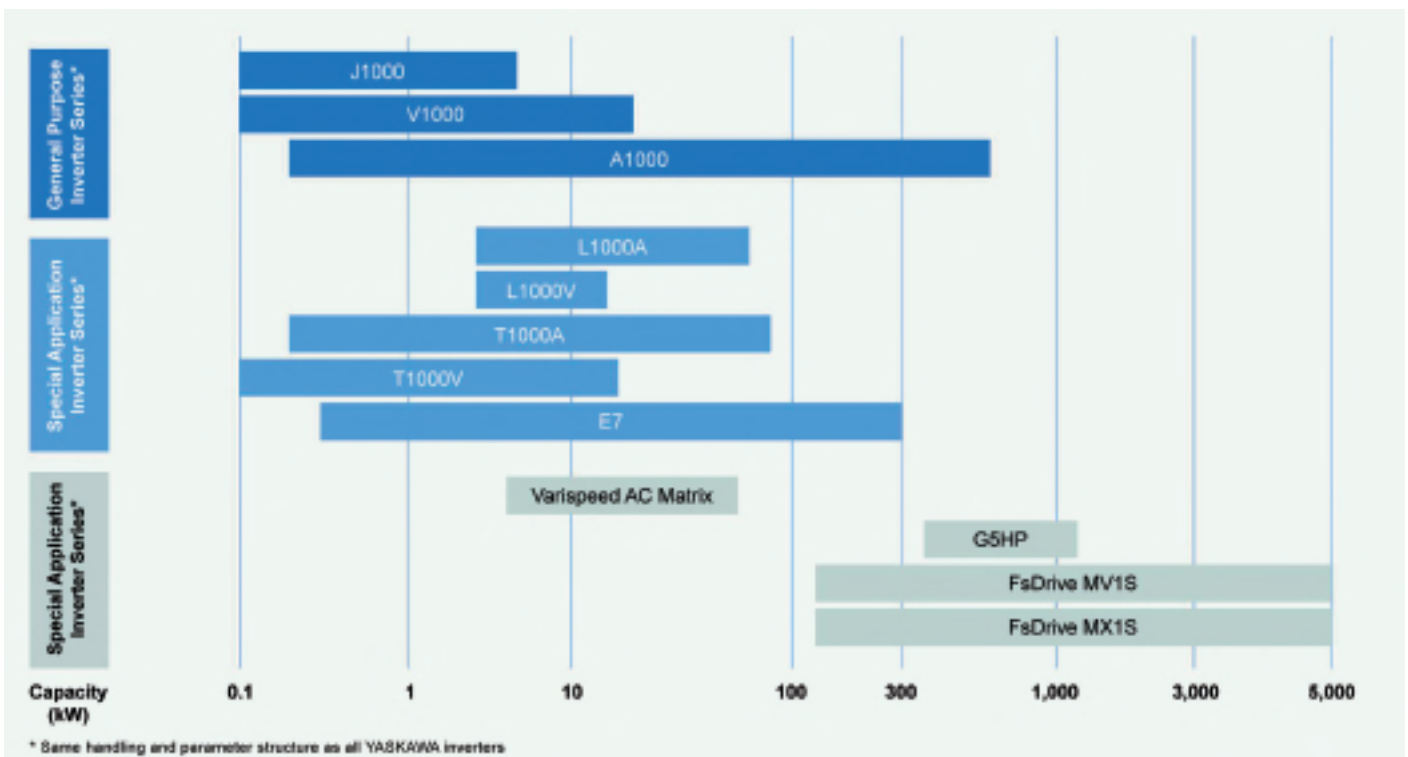
Reliable Operation

- Long life design for 10 years of maintenance free operation
- High torque performance (A1000 200% at 0.3 Hz, V1000 200% at 0,5 Hz, J1000 150% at 3,0 Hz) Without encoder
- Power- Loss- Ride- Through and Fault Restart Functions ensure continuous running of the motor

Easy Handling

- Same Parameter structure for all YASKAWA Inverter drives „If you know one you know them all!“
- Application Parameter Presets automatically adjusts parameter for major applications
- Screwless Multifunction Terminal Board with parameter storage function*
- Online Auto- Tuning
- USB Copy Unit
- LED/ LCD Operator

INVERTER SERIES



1000 Series

J1000

Compact Inverter Drive



The J1000 meets all automation requirements for compact applications with variable speed operation and energy saving characteristics. A wide range of useful functions upgrade your machine and offer great potentials.

Features

- Stall Prevention Functions for stable operation during changes of load or power supply
- Over- Excitation Braking for quick deceleration without external braking resistor

V1000

Compact Vector Control 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.

Features

- High flux braking for 50% reduction of braking time
- Quick response on load and speed changes to improve machine performance
- Online Auto- Tuning to optimise for improved motor performance at low speed
- Open Loop Vector Control for PM motor operation
- Safe Disable Inputs for Safe Torque OFF

A1000

High Performance Vector Control Drive



The A1000 is the premium inverter from YASKAWA. It provides great operation reliability, environmental benefits and energy savings as well as many other user oriented operational features that make it a first class choice.

Features

- Electrical saliency in IPM motors which enables speed, direction and rotor position detection without external feedback devices
- Advanced Auto- Tuning functions to adjust automatically motor settings and analyse continuously changes during motor operation to achieve highest machine performance
- Advanced energy- saving control technology which improves efficiency and machine productivity in combination with induction and synchronous motor operation

Special Application Inverter Series

For High Performance Textile Applications

T1000A

The T1000A is the high performance vector control AC Drive specially developed for textile applications. Special hardware and software features make this inverter drive specifically adapted to the needs of the textile industries.

Features

- Standard traverse functions to optimise the winding of the yarn around the drum
- Pulse output for traverse functions, synchronized accel/ decel line speed, pulse train speed reference, pulse output, etc. ideal for textile machinery
- IP54 enclosure options are also available
- Option cards available for all major serial networks: PROFIBUS- DP, DeviceNet, CC- Link, CANopen, MECHATROLINK, etc.



AC Drive for Textile Machinery

T1000V

The T1000 is the compact size Inverter for textile application. It includes many useful features and functions which correspond to the needs of textile machinery.

Features

- All models also as finless version
- Kinetic Energy Buffering Function for synchronous decel/ accel in case of temporary power loss
- Standard traverse functions to optimise the winding of the yarn around the bobbin
- Synchronous operation of multiple drives ensuring constant speed ratio between motors



The HVAC Inverter Drive

E7

Low noise operation and special HVAC functionality make the E7 the ideal inverter drive for fans, pumps, etc. The integrated PI controller is optimised to be easily adjusted for e. g. temperature, flow or pressure (also differential pressure) control.

Features

- Intelligent energy saving function for the reduction of energy consumption especially under part load
- Low noise operation
- Flexible PI control with user- specific units
- Speed search function for catching coasting fans
- Optional HOA (Hand- Off- Auto) operator for easy start- up



Special Purpose Inverter Series

Varispeed AC Environmental friendly Matrix Converter



The Varispeed AC is an example for YASKAWA innovative spirit. It is the world's first series produced matrix converter. Direct conversion of AC input voltage to AC output voltage is a real technical advancement in times of limited resources and improved energy efficiency. The Varispeed AC not only improves energy efficiency, but also solves many problems typically associated with conventional inverters drives.

Features

- Sine- wave PWM control with 9 bi- directional switches
- Direct conversion of 3- phase AC power to AC power required to control voltage and frequency output
- Simple drive design due to missing sine- wave converter, DC link circuit and electrolytic capacitors, devices to prevent harmonics, or braking units
- Energy regeneration functions without special devices
- Less wiring to simplify installation and maintenance

G5HP Extra Value at Maximum Cost Performance



The Varispeed-656G5HP is the best solution for systems in the high power segment. It achieves optimum control over a wide range of applications for variable torque such as fans and pumps and constant torque applications such as extruders and printing machines.

Features

- Variable speed range of 1:1000 torque limit (in flux vector mode)
- High starting torque: 150% at 1Hz (open loop); 150% at 0 Hz (closed loop)

FSDrive- MV1S / FSDrive- MX1S



YASKAWA has developed Japan's first commercially produced PWM controlled, medium voltage inverter with multi output connection. Based on these innovative technologies, the FSDrive- MV1S inverter represents the company's attitude to develop an easy to use inverter with great operability and improved monitoring functions. The FSDrive- MX1S enables unbelievable energy savings due to its power regeneration function and optimum control of all medium voltage motors due to sinusoidal waveforms of the power supply and output signals.

FSDrive- MV1S Features

- Enhanced trace function and LAN compatibility for easy monitoring the operation status for protective maintenance
- Constant operation during momentary power loss of several cycles (Holding time depends on the load forms or operation status). Instant re- acceleration to the referenced speed to ensure smooth restart
- V/ f Control additionally enabling parallel operation of multiple motors with one inverter to reduce needed drive equipment



FSDrive- MX1S Features

- Dynamic operation at variable speeds for quick respond sudden speed changes
- Design for applications requiring low- speed operation and quick deceleration
- Optional PLC card enables the use of ladder program for individual software
- Enhanced trace function and LAN compatibility for easy monitoring operation status, protective maintenance and quick intervention

Special Application Inverter Series

L1000A

Lift Drive for Modernisation and New Construction



The YASKAWA L1000A is the new special purpose lift inverter drive designed for 3 Million starts at 165% output current. It provides advanced control functions to run induction and PM motor applications in geared or gearless elevator systems.

Features

- New sensor- less torque compensation function including anti- rollback function, preventing shock and ensures a smooth start
- New torque ripple suppression function for smooth start/ stop and comfortable acceleration and deceleration characteristics
- Overshoot and anti vibration control including feed forward function, accel/ decel compensation and 5 independent S- curve settings which ensure a perfectly smooth ride
- UPS and light load direction search function provide reliable rescue operation
- New stationary Auto- Tuning with closed brake
- One motor contactor solution in compliance with EN81-1

L1000V

For Open- loop Lift Applications



The compact lift inverter drive L1000V was designed for low speed operation (up to 1 m/ sec) of geared motors. Optimised standard functions simplify set- up, operation and maintenance, while ensuring smooth and comfortable rides. It upgrades lift systems in terms of reduced costs and enhanced comfort.

Features

- One motor contactor solution (in compliance with EN81-1)
- Two relay outputs for fault and brake control reduce installation effort and costs
- Simple and efficient brake sequences enable smooth operation
- Five independent settings of S- Curves to prevent jerks
- Pulse input feedback with PG and load detection during run to increase levelling accuracy



J1000 Series Specifications

		Specifications
Control Characteristics	Control methods	V/ f Control
	Frequency Control Range	0.01 to 400 Hz
	Frequency Accuracy (Temperature Fluctuation)	Digital input: within ±0.01% of the max. output frequency (-10°C to +50°C) Analog input: within ±0.5% of the max. output frequency (25°C ±10°C)
	Frequency Setting Resolution	Digital input: 0.01 Hz Analog input: 1/1000 of max. frequency
	Output Frequency Resolution	1/2 ²⁰ x Maximum output frequency (E1-04)
	Frequency Setting Signal	Main frequency reference: 0 to +10 Vdc (20 kΩ), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω)
	Starting Torque	150% / 3 Hz
	Speed Control Range	1:20
	Accel/ Decel Time	0.0 to 6000.0 s (4 selectable settings of independent acceleration and deceleration time)
	Braking Torque	1) Short- time decel torque ¹⁾ : over 150% for 0.1/0.2 kW motors, over 100% for 0.4/ 0.75 kW motors, over 50% for 1.5 kW motors, and over 20% for 2.2 kW and above motors. 2) Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option ²⁾ : 10% ED, 10 s, internal braking transistor)
	V/ f Characteristics	User- set programmable V/ f preset patterns possible
Main Control Functions	Momentary power loss ride- thru, Speed search, Multi- Step Speed (max. 9 steps), Accel/ decel time switch, S- curve accel/ decel, 3- wire sequence, Cooling fan on/ off, Slip compensation, Torque compensation, Frequency jump, Upper/ lower limits for frequency reference, DC injection braking at start and stop, Overexcitation braking, Fault restart ...	
Protection Function	Motor Protection	Motor overheat protection based on output current
	Momentary Overcurrent Protection	Drive stops when output current exceeds 200% of Heavy Duty Rating
	Overload Protection	Drive stops after 60 s at 150% of rated output current (Heavy Duty Rating) ³⁾
	Overvoltage Protection	200 V class: Stops when DC bus exceeds approx. 410 V 400 V class: Stops when DC bus exceeds approx. 820 V
	Undervoltage Protection	Stops when DC bus voltage falls below the following levels: 190 V (3- phase 200 V), 160 V (single- phase 200 V), 380 V (3- phase 400 V), 350 V (3- phase 380 V)
	Momentary Power Loss Ride- Thru	Stops after approx. 15 ms (default).
	Heatsink Overheat Protection	Protected by thermistor
	Braking Resistance Overheat Protection	Overheat input signal for braking resistor (optional ERF- type, 3% ED)
	Stall Prevention	Separate settings allowed during acceleration and during run. Enable/ disable only during deceleration.
	Ground Fault Protection	Protected by electronic circuit ⁴⁾
	Charge LED	Charge LED remains lit until DC bus falls below approx. 50 V
Operating Environment	Area of Use	Indoors
	Ambient Temperature	-10 to +50°C (IP20 open chassis), -10 to +40°C (NEMA Type 1)
	Humidity	95 RH % or less (no condensation)
	Storage Temperature	-20 to +60°C (short- term temperature during transportation)
	Altitude	Max. 1000 m (output derating of 1% per 100 m above 1000 m, max. 3000 m)
	Shock	10 to 20 Hz (9.8 m/ s ²) max., 20 to 55 Hz (5.9 m/ s ²) max.
Safety Standard		UL508C
Protection Design		IP20 open- chassis, NEMA Type 1 enclosure (option)

¹⁾ Momentary average deceleration torque refers to the torque required to decelerate the motor (uncoupled to the load) from the rated motor speed down to zero in the shortest time.
²⁾ Parameter L3-04 should be disabled when a Braking Resistor or Braking Resistor Unit is connected.
³⁾ Overload protection may be triggered at lower levels if output frequency is below 6 Hz.
⁴⁾ Protection may not be provided under the following conditions as the motor windings are grounded internally during run:
• Low resistance to ground from the motor cable or terminal block.
• Drive already has a short- circuit when the power is turned on.

J1000 Series



The J1000 cutting-edge features such as:

- V/ f Control
- Plug' n Play installation function
- Over- Excitation Braking
- Easy parameter programming and controller functions
- Braking Chopper
- Heavy duty / normal duty rating
- International standards

Yaskawa J1000 Features & Functions

Performance

- Compact Design –Small design and side-by- side mounting reduce installation space and costs.
- Stall Prevention Functions
Stall prevention ensures stable operation during momentary power loss, change of load or power supply.
- International Standards –RoHS, CE, cUL, UL compliance.
- High Torque Performance –Detects load and automatically adjusts torque regardless the actual speed conditions.
- Digital Operator –5 digit display, 8 keys on the operator as well as Verify Function for changed parameter values.

Options

- Parameter Copy Unit
- Optional LED Remote Operator
- Serial Communication Option – Compatible with RS-422/485 Interface for MEMOBUS communication.
- Speed Potentiometer

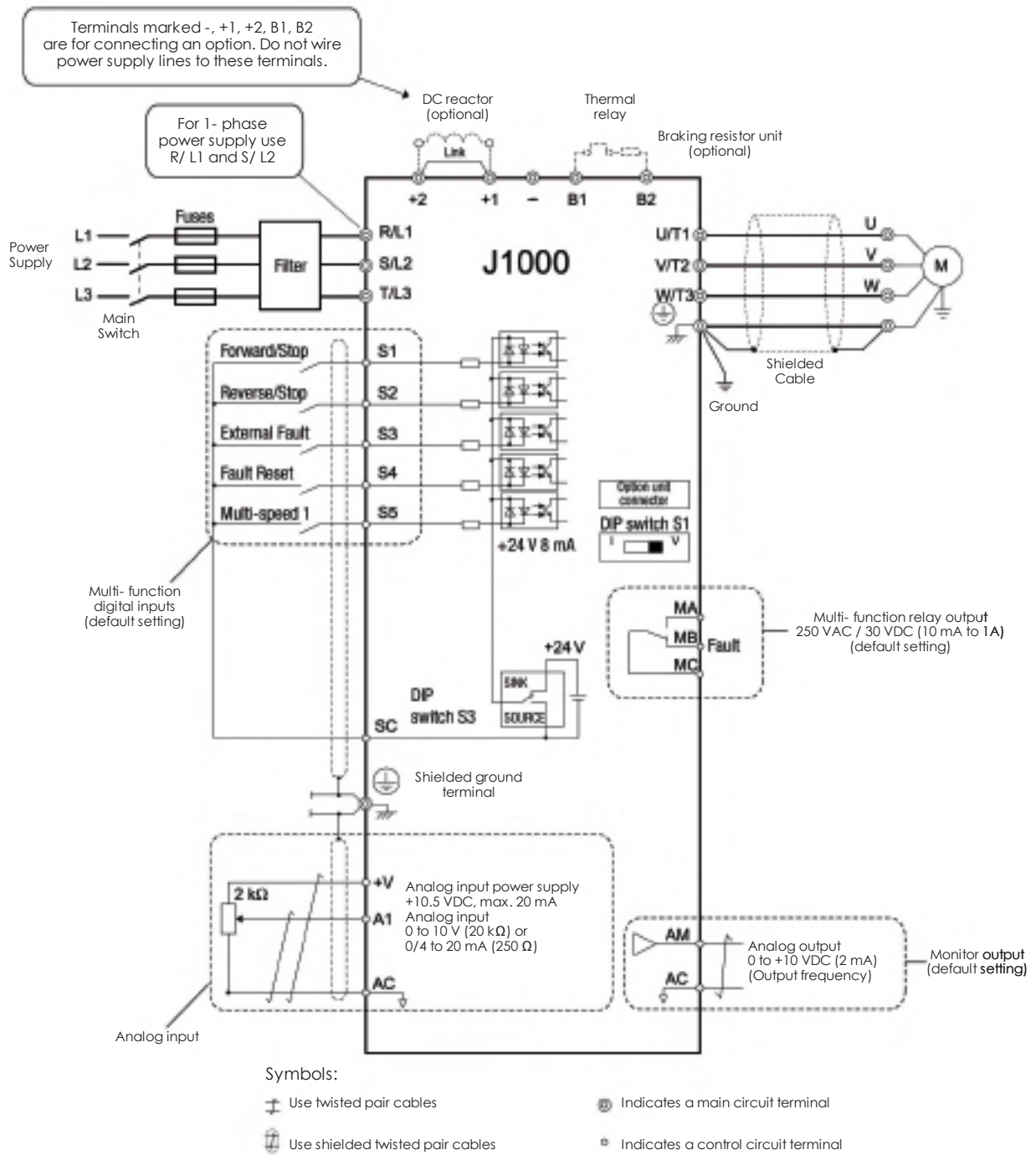
Functions

- Easy Set- Up Functions –Enables quick installation and operation.
- Over- Excitation Braking –For quick deceleration without external braking resistor.
- Maintenance monitor informs in advance about recommended maintenance for cooling fan and electrolytic capacitors.

- Small Design –Big Power:
150% overload in heavy duty service is possible. For applications with low overload requirements the drive can be operated with 120% overload in normal duty service. Consequently you can use a drive of smaller size to do the work of a bigger one.
- Tough Operation –Power- Loss- Ride- Through and Fault Restart Functions ensure continuous running of the motor.
- Drive Wizard Plus –Free of charge parameter set- up and maintenance tool.

J1000 Series

Connection Diagram



J1000 Series Dimensions

Enclosures

Standard J1000 uses IP20 design.
NEMA 1 kits are available to convert the standard IP20 design to a NEMA Type 1 enclosure rating.

Open- Chassis [IP20]

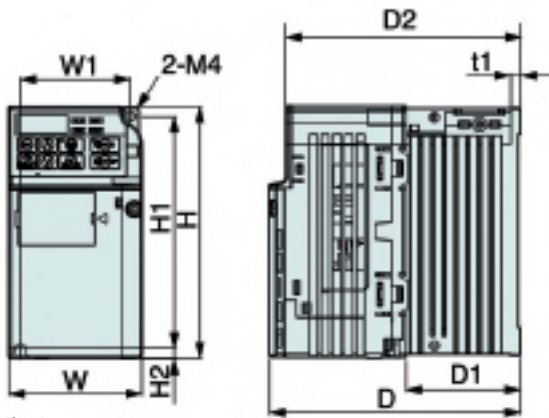


Fig. 1

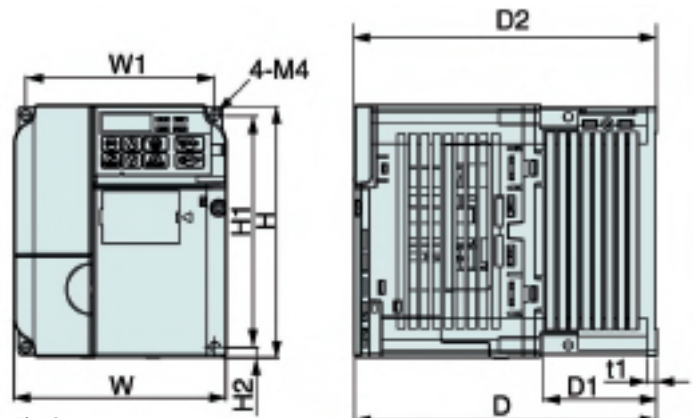
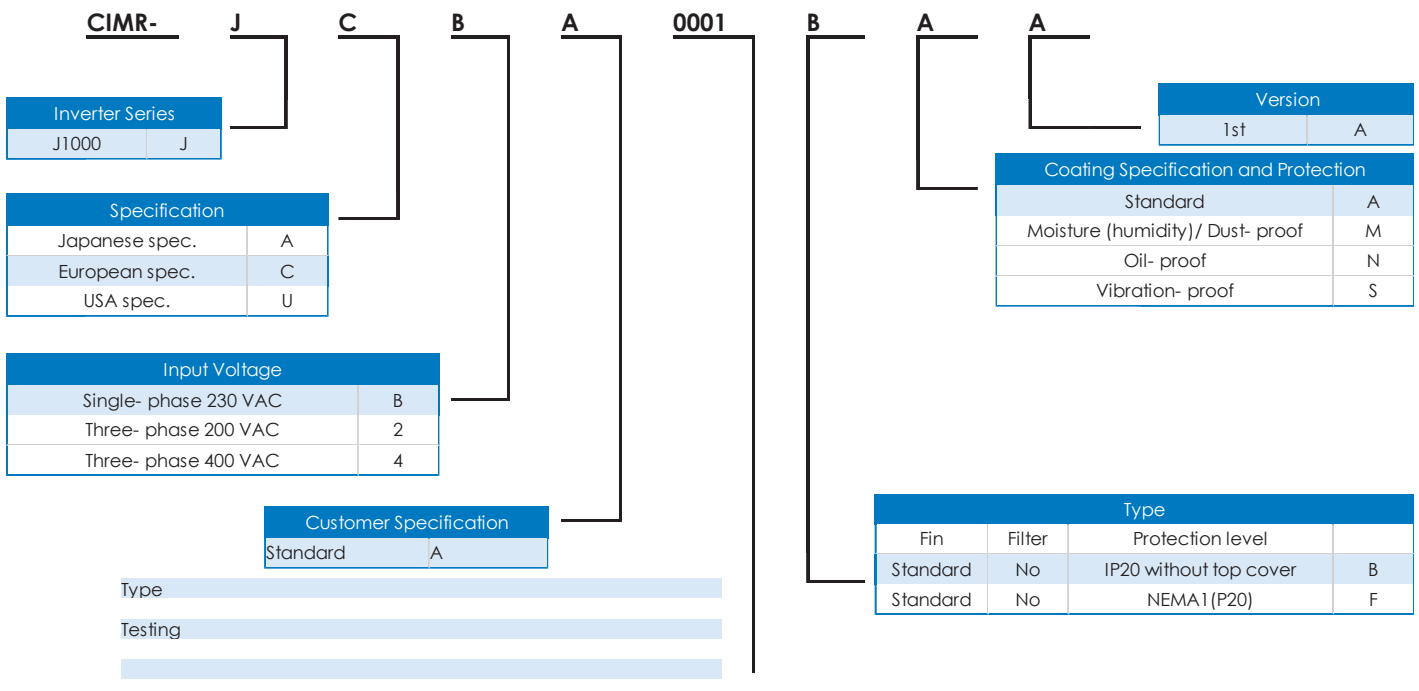


Fig. 2

Voltage Class	Drive Model CIMR- JA	Figure	Dimensions in mm									Weight (kg)	Cooling
			W	H	D	W1	H1	H2	D1	D2	t1		
Three- Phase 200 V Class	2A0001B	1	68	128	76	56	118	5	6.5	67.5	3	0.6	Self- cooled
	2A0002B		68	128	76	56	118	5	6.5	67.5	3	0.6	
	2A0004B		68	128	108	56	118	5	38.5	99.5	5	0.9	
	2A0006B		68	128	128	56	118	5	58.5	119.5	5	1.1	
	2A0010B	2	108	128	129	96	118	5	58	120.5	5	1.7	Fan cooled
	2A0012B		108	128	137.5	96	118	5	58	129	5	1.7	
	2A0020B		140	128	143	128	118	5	65	134.5	5	2.4	
Single- Phase 200 V Class	BA0001B	1	68	128	76	56	118	5	6.5	67.5	3	0.6	Self- cooled
	BA0002B		68	128	76	56	118	5	6.5	67.5	3	0.6	
	BA0003B		68	128	118	56	118	5	38.5	109.5	5	1.0	
	BA0006B	2	108	128	137.5	96	118	5	58	129	5	1.7	Fan cooled
	BA0010B		108	128	154	96	118	5	58	145.5	5	1.8	
Three- Phase 400 V class	4A0001B	2	108	128	81	96	118	5	10	72.5	5	1.0	Self- cooled
	4A0002B		108	128	99	96	118	5	28	90.5	5	1.2	
	4A0004B		108	128	137.5	96	118	5	58	129	5	1.7	
	4A0005B		108	128	154	96	118	5	58	145.5	5	1.7	Fan cooled
	4A0007B		108	128	154	96	118	5	58	145.5	5	1.7	
	4A0009B		108	128	154	96	118	5	58	145.5	5	1.7	
	4A0011B		140	128	143	128	118	5	65	134.5	5	2.4	

J1000 Series Ratings & Type Descriptions



Voltage Class		200 V						
Inverter Model	Three Phase Inverter CIMR- JC2A	0001	0002	0004	0006	0010	0012	0020
	Single Phase ¹ Inverter CIMR- JCBA	0001	0002	0003	0006	0010	-	-
Inverter output	Motor output kW at normal duty ²	0.2	0.4	0.75	1.1	2.2	3.0	5.5
	Motor output kW at heavy duty ²	0.1	0.2	0.4	0.75	1.5	2.2	4.0
	Rated output current at normal duty [A] ³	1.2	1.9	3.5 (3.3)	6.0	9.6	12.0	19.6
	Rated output current at heavy duty [A]	0.8 ⁵	1.6 ⁵	3 ⁵	5.0 ⁵	8.0 ⁵	11.0 ⁵	17.5 ⁵
	Overload	120% for 60 sec at normal duty, 150% for 60 sec at heavy duty from inverter rated output current						
	Rated output power ⁴ at normal duty [kVA] ³	0.5	0.7	1.3	2.3	3.7	4.6	7.5
	Rated output power ⁴ at heavy duty [kVA]	0.3	0.6	1.1	1.9	3.0	4.2	6.7
	Max. output voltage	Three- phase power supply: three- phase 200 to 240 V (relative to input voltage) Single- phase power supply: three- phase 200 to 240 V (relative to input voltage)						
	Max. output frequency	400 Hz						
Inverter input	Rated input voltage	Three- phase 200 to 240 V +10%/-15% , Single- phase 200 to 240 V +10%/-15%						
	Rated input frequency	50/60 Hz, ±5%						

¹ Drives with a single- phase power supply input have three- phase output. Single- phase motors cannot be used.
² The motor capacity (kW) refers to a YASKAWA 4- pole, 60 Hz, 200 V motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.
³ This value assumes a carrier frequency of 2 kHz to Swing PWM. Increasing the carrier frequency requires a reduction in current.
⁴ Rated output capacity is calculated with a rated output voltage of 220 V.
⁵ This value assumes a carrier frequency of 10 kHz. Increasing the carrier frequency requires a reduction in current.
⁶ This value assumes a carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.

Voltage Class		400 V						
Inverter Model	Three Phase Inverter CIMR- JC4A	0001	0002	0004	0005	0007	009	0011
Inverter output	Motor output kW at normal duty ¹	0.4	0.75	1.5	2.2	3.0	3.7	5.5
	Motor output kW at heavy duty ¹	0.2	0.4	0.75	1.5	2.2	3.0	3.7
	rated output current at normal duty ² [A]	1.2	2.1	4.1	5.4	6.9	8.8	11.1
	rated output current at heavy duty ³ [A]	1.2	1.8	3.4	4.8	5.5	7.2	9.2
	Overload	120% for 60 sec at normal duty, 150% for 60 sec at heavy duty from inverter rated output current						
	Rated output power ⁴ at normal duty ² [kVA]	0.9	1.6	3.1	4.1	5.3	6.7	8.5
	Rated output power ⁴ at heavy duty ³ [kVA]	0.9	1.4	2.6	3.7	4.2	5.5	7.0
	Max. output voltage	Three- phase 380 to 480 V (proportional to input voltage)						
	Max. output frequency	400 Hz						
Inverter input	Rated input voltage	Three- phase 380 to 480 V +10%/-15%						
	Rated input frequency	50/60 Hz +/-5%						

¹ The motor capacity (kW) refers to a YASKAWA 4- pole, 60 Hz, 400 V motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.
² This value assumes a carrier frequency of 2 kHz to Swing PWM. Increasing the carrier frequency requires a reduction in current.
³ This value assumes a carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.
⁴ Rated output capacity is calculated with a rated output voltage of 440 V.

V1000 Series



YASKAWA V1000 Features

- Dual Safety Input, safety category 3 (EN954-1) and stop category 0 (EN60204-1) and IEC-61508 SIL2
- In normal duty (120% overload) one frame size larger motor can be driven
- Standard AC Motor and PM motor control
- V/ f and open- loop current vector control
- One of the smallest inverter drives in the world
- Side- by- side mounting
- Icon- based programming
- Designed for 10 years of maintenance- free operation

“One for all” –Multiple Applications

YASKAWA V1000 is a general purpose inverter drive covering the demands of a wide field of applications.

Simple duties as well as requirements of complex systems need a higher level of functionality, reliability and easy handling, which are provided by the V1000.

- For energy saving, permanent magnet motor control is possible
- Selectable control method: open- loop current vector or V/ f
- Small Design –Big Power: 150% overload in heavy duty service is possible. For applications with low overload requirements the drive can be operated with 120% overload in normal duty service. Consequently you can use a drive of smaller size to do the work of a bigger one.
- Worldwide specification CE, UL, cUL, RoHS (TÜV safety approved)
- High flux braking reduces braking time to the half

V1000 Series Specifications

Voltage class		Single- phase 230 V						
Inverter model CIMR- VCBA ¹		0001	0002	0003	0006	0010	0012	00018 ⁶
Inverter output	Motor output kW at normal duty ²	0.18	0.37	0.75	1.1	2.2	3.0	-
	Motor output kW at heavy duty ²	0.1	0.18	0.55	0.75	1.5	2.2	4.0
	Rated output current at normal duty [A] ³	1.2	1.9	3.3	6	9.6	12	-
	Rated output current at heavy duty [A]	0.8 ⁴	1.6 ⁴	3.0 ⁴	5.0 ⁴	8.0 ⁵	11.0 ⁵	17.5 ⁵
Overload		125% for 60 sec normal duty, 150 % for 60 sec at heavy duty from inverter rated output current						
Inverter input	Rated output power at normal duty [kVA]*	0.5	0.7	1.3	2.3	3.7	4.6	8.0
	Rated output power at heavy duty [kVA]*	0.3	0.6	1.1	1.9	3.0	4.2	6.7
	Max. output voltage	Three- phase 200 to 240 V (proportional to input voltage)						
	Max. output frequency	400 Hz						
	Rated input voltage	Single- phase 200 to 240 V, -15% to +10%						
Rated input frequency		50/60 Hz, ±5%						

* based on input voltage 220 V

Voltage class		Three- phase 200 V										
Inverter model CIMR- VC2A		0001	0002	0004	0006	0010	0012	0020	0030	0040	0056	0069
Inverter output	Motor output kW at normal duty ²	0.18	0.37	0.75	1.1	2.2	3.0	5.5	7.5	11.0	15.0	18.5
	Motor output kW at heavy duty ²	0.1	0.2	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11.0	15.0
	Rated output current at normal duty [A] ³	1.2	1.9	3.5	6.0	9.6	12.0	19.6	30.0	40.0	56.0	69.0
	Rated output current at heavy duty [A]	0.8 ⁴	1.6 ⁴	3.0 ⁴	5.0 ⁴	8.0 ⁵	11.0 ⁵	17.5 ⁵	25.0 ⁵	33.0 ⁵	47.0 ⁵	60.0 ⁵
Overload		120% for 60 sec at normal duty, 150% for 60 sec at heavy duty from inverter rated output current										
Inverter input	Rated output power at normal duty [kVA]*	0.5	0.7	1.3	2.3	3.7	4.6	7.5	11.4	15.2	21.3	26.3
	Rated output power at heavy duty [kVA]*	0.3	0.6	1.1	1.9	3.0	4.2	6.7	9.5	12.6	17.9	22.9
	Max. output voltage	Three- phase 200 to 240 V (proportional to input voltage)										
	Max. output frequency	400 Hz										
	Rated input voltage	Three- phase 200 to 240 V, -15% to +10%										
Rated input frequency		50/60 Hz, ±5%										

* based on input voltage 220 V

Voltage class		Three- phase 400 V										
Inverter model CIMR- VC4A		0001	0002	0004	0005	0007	0009	0011	0018	0023	0031	0038
Inverter output	Motor output kW at normal duty ²	0.37	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15.0	18.5
	Motor output kW at heavy duty ²	0.18	0.37	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11.0	15.0
	Rated output current at normal duty [A] ³	1.2	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23.0	31.0	38.0
	Rated output current at heavy duty [A] ⁵	1.2	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24.0	31.0
Overload		120% for 60 sec at normal duty, 150% for 60 sec at heavy duty from inverter rated output current										
Inverter input	Rated output power at normal duty [kVA]*	0.9	1.6	3.1	4.1	5.3	6.7	8.5	13.3	17.5	23.6	29.0
	Rated output power at heavy duty [kVA]*	0.9	1.4	2.6	3.7	4.2	5.5	7.0	11.3	13.7	18.3	23.6
	Max. output voltage	Three- phase 380 to 480 V (proportional to input voltage)										
	Max. output frequency	400 Hz										
	Rated input voltage	Three- phase 380 to 480 V, -15% to +10%										
Rated input frequency		50/60 Hz, ±5%										

* based on input voltage 400 V

¹ Drives with a single- phase power supply input have three- phase output. Single- phase motors cannot be used.

² The motor capacity (kW) refers to a YASKAWA 4- pole, 60 Hz, 200 V motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.

³ at 2 kHz carrier frequency without derating

⁴ at 10 kHz carrier frequency without derating

⁵ at 8 kHz carrier frequency without derating

⁶ only heavy duty frequency available

V1000 Series Specifications

		Specifications
Control	Control methods	Open Loop Vector Control (Current Vector), V/ f Control, PM Open Loop Vector Control (for SPM and IPM motors)
	Functions	
	Frequency Control Range	0.01 to 400 Hz
	Frequency Accuracy (Temperature Fluctuation)	Digital input: within $\pm 0.01\%$ of the max. output frequency (-10 to $+50^{\circ}\text{C}$) Analog input: within $\pm 0.1\%$ of the max. output frequency ($25^{\circ}\text{C} \pm 10^{\circ}\text{C}$)
	Frequency Setting Resolution	Digital input: 0.01 Hz Analog input: 1/1000 of max. frequency
	Output Frequency Resolution	20 bit of maximum output frequency (parameter E1-04 setting)
	Frequency Setting Resolution	Main frequency reference: 0 to $+10$ Vdc (20 k Ω), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) 9- bit Main speed reference : Pulse Train Input (max. 32 kHz)
	Starting Torque	200% / 0.5 Hz (assumes Heavy Duty rating AC Motor of 3.7 kW or less using Open Loop Vector Control), 50% / 6 Hz (assumes PM Open Loop Vector Control)
	Speed Control Range	1:100 (Open Loop Vector Control), 1:20 to 40 (V/ f Control), 1:10 (PM Open Loop Vector Control)
	Speed Control Accuracy	$\pm 0.2\%$ in Open Loop Vector Control ($25^{\circ}\text{C} \pm 10^{\circ}\text{C}$) ¹
	Speed Response	5 Hz in Open Loop Vector ($25^{\circ}\text{C} \pm 10^{\circ}\text{C}$) (excludes temperature fluctuation when performing Rotational Auto- Tuning)
	Torque Limit	Open Loop Vector Control allows separate settings in four quadrants
	Accel/ Decel Time	0.0 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
	Braking Torque	1) Short- time decel torque ² : over 150% for 0.1/0.2 kW motors, over 100% for 0.4/ 0.75 kW motors, over 50% for 1.5 kW motors, and over 20% for 2.2 kW and above motors (overexcitation braking/ High- Slip Braking: approx. 40%) 2) Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option*3: 10% ED, 10 s, internal braking transistor)
	V/ f Characteristics	User- selected programs, V/ f preset patterns possible
	Main Control Functions	Momentary power loss ride- thru, Speed search, Overtorque detection, Torque limit, 17- step speed (max), Accel/ decel time switch, S- curve accel/ decel, 3- wire sequence, Auto- tuning (rotational, stationary tuning for resistance between lines), Dwell, Cooling fan on/ off switch, Slip compensation, Torque compensation, Frequency jump, Upper/ lower limits for frequency reference, DC injection braking at start and stop, Overexcitation braking, High slip braking, PID control (with sleep function), Energy saving control, MEMOBUS comm. (RS- 485/422 max. 115.2 kbps), Fault restart, Application presets, DriveWorksEZ (customized function), Removable terminal block with parameter backup function...
Protection Function	Motor Protection	Motor overheat protection based on output current
	Momentary Overcurrent Protection	Drive stops when output current exceeds 200% of Heavy Duty Rating
	Overload Protection	Drive stops after 60 s at 150% of rated output current (Heavy Duty Rating) ⁴
	Overvoltage Protection	200 V class: Stops when DC bus exceeds approx. 410 V 400 V class: Stops when DC bus exceeds approx. 820 V
	Undervoltage Protection	Stops when DC bus voltage falls below the following levels: Three- phase 200 V class: approx. 190 V, single- phase 200 V class: approx. 160 V, three- phase 400 V class: approx. 380 V, three- phase 380 V class: approx. 350 V
	Momentary Power Loss Ride- Thru	Stops after approx. 15 ms (default). Parameter settings allow the drive to continue running if power loss lasts for up to approx. 2 s
	Heatsink Overheat Protection	Protection by electronic circuit ⁴
	Braking Resistance Overheat Protection	Charge LED remains lit until DC bus falls below approx. 50 V
	Stall Prevention	Indoors
	Ground Fault Protection	Protection by electronic circuit ⁴
	Charge LED	Charge LED remains lit until DC bus has fallen below approx. 50V
Operating Environment	Area of Use	Indoors
	Ambient Temperature	- 10 to $+50^{\circ}\text{C}$ (open chassis), - 10 to $+40^{\circ}\text{C}$ (NEMA Type 1)
	Humidity	95 RH % or less (no condensation)
	Storage Temperature	-20 to $+60^{\circ}\text{C}$ (short- term temperature during transportation)
	Altitude	Max. 1000 m (output derating of 1% per 100 above 1000 m, max. 3000 m)
	Shock	10 to less than 20 Hz (9.8m/ s ²) max., 20 to 55 Hz (5.9 m/ s ²) max.
	Safety Standard	UL508C, EN954-1 Cat- 3, IEC/ EN51508 SIL2
	Protection Design	IP20 open- chassis, NEMA Type 1 enclosure

*1 Speed control accuracy may vary slightly depending on installation conditions or motor used.

*2 Momentary average deceleration torque refers to the deceleration torque from 60Hz down to 0 Hz. This may vary depending on the motor.

*3 If L3-04 is enabled when using a braking resistor or braking resistor unit, the motor may not stop within the specified deceleration time.

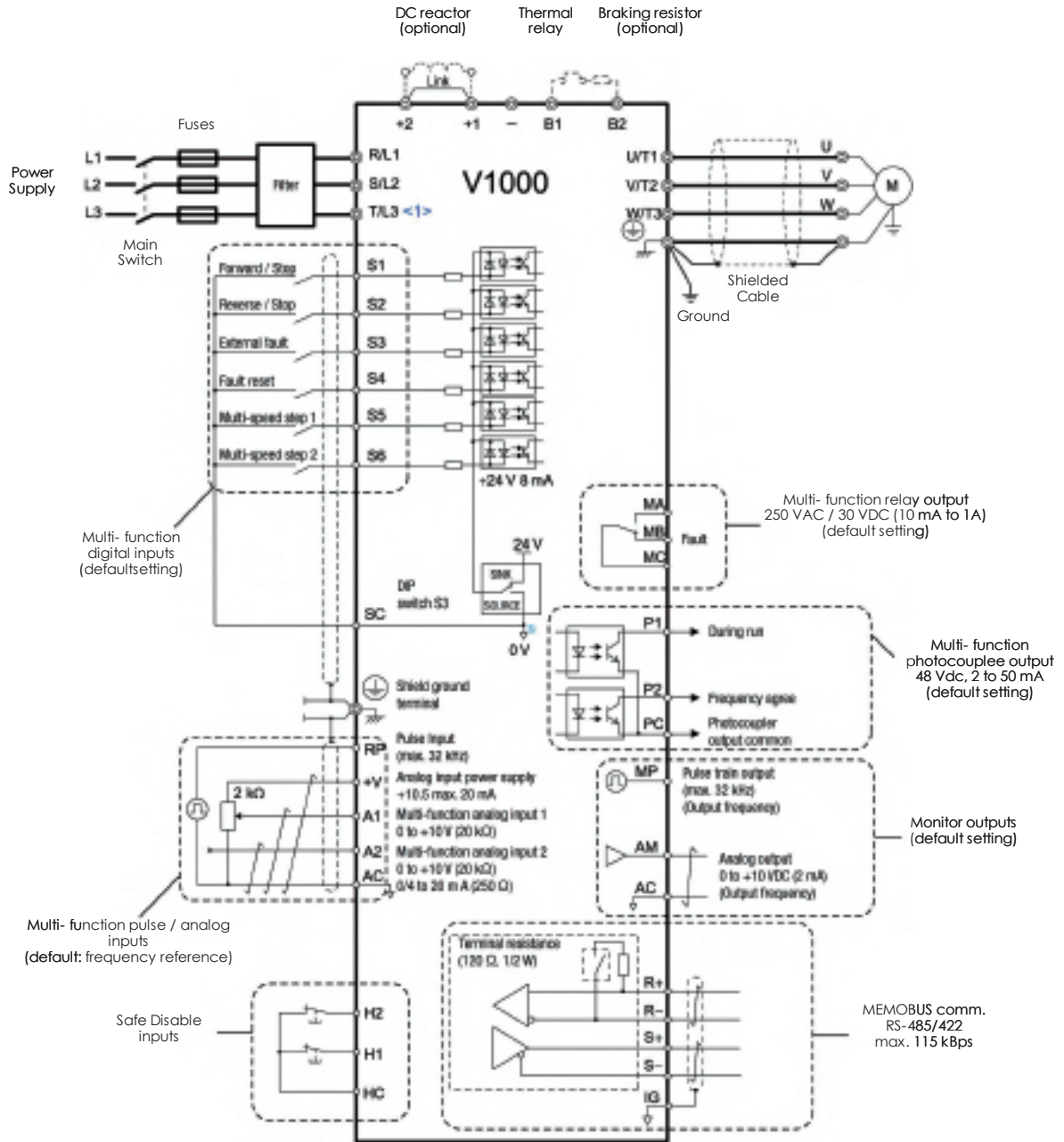
*4 Overload protection may be triggered at lower levels if output frequency is below 6 Hz.

*5 Varies by drive capacity. Drives smaller than 7.5 kW (CIMR- VA2A0004/ CIMR- VA4A0023) require a separate Momentary Power Loss Recovery Unit to continue operating during a momentary power loss of 2 s.

*6 Protection may not be provided under the following conditions as the motor windings are grounded internally during run:

- Low resistance to ground from the motor cable or terminal block.
- Drive already has a short- circuit when the power is turned on.

V1000 Series Connection Diagram

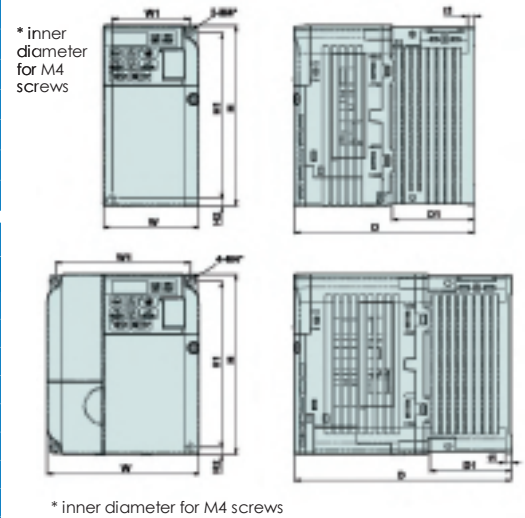


- ⊕ Use twisted pair cables.
- ⊕ Use shielded twisted pair cables.
- ⊕ Indicates a main circuit terminal.
- ⊕ Indicates a control circuit terminal.

V1000 Series Dimensions

IP20/ Open- Chassis (without an EMC filter)

Voltage Class	Drive Model CIMR- VC	Dimensions in mm								Weight (kg)
		W1	H1	W	H	D	t1	H2	D1	
Single- Phase 200 V Class	BA0001B	56	118	68	128	76	3	5	6,5	0,6
	BA0002B	56	118	68	128	76	3	5	6,5	0,6
	BA0003B	56	118	68	128	118	5	5	38,5	1,0
Three- Phase 200 V Class	2A0001B	56	118	68	128	76	3	5	6,5	0,6
	2A0002B	56	118	68	128	76	3	5	6,5	0,6
	2A0004B	56	118	68	128	108	5	5	38,5	0,9
	2A0006B	56	118	68	128	128	5	5	58,5	1,1

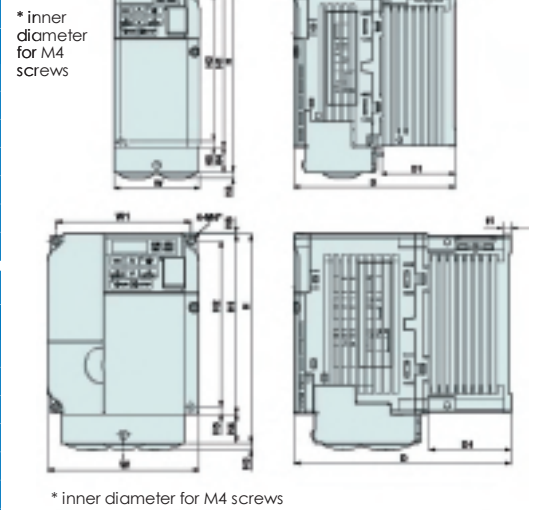


Voltage Class	Drive Model CIMR- VC	Dimensions in mm								Weight (kg)
		W1	H1	W	H	D	t1	H2	D1	
Single- Phase 200 V Class	BA0006B	96	118	108	128	137,5	5	5	58	1,7
	BA0010B	96	118	108	128	154	5	5	58	1,8
	BA0012B	128	118	140	128	163	5	5	65	2,4
	BA0018B	158	118	170	128	180	5	5	65	3
Single- Phase 200 V Class	2A0010B	96	118	108	128	129	5	5	58	1,7
	2A0012B	96	118	108	128	137,5	5	5	58	1,7
	2A0020B	128	118	140	128	143	5	5	65	2,4
Three- Phase 400 V Class	4A0001B	96	118	108	128	81	5	5	10	1
	4A0002B	96	118	108	128	99	5	5	28	1,2
	4A0004B	96	118	108	128	137,5	5	5	58	1,7
	4A0005B	96	118	108	128	154	5	5	58	1,7
	4A0007B	96	118	108	128	154	5	5	58	1,7
	4A0009B	96	118	108	128	154	5	5	58	1,7
	4A0011B	128	118	140	128	143	5	5	65	2,4

* inner diameter for M4 screws

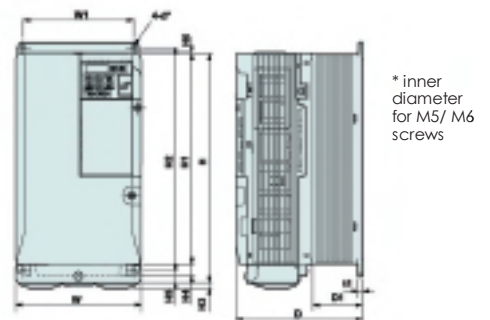
IP20/ NEMA Type 1 (without an EMC filter)

Voltage Class	Drive Model CIMR- VC	Dimensions in mm											Weight (kg)	
		W1	H2	W	H1	D	t1	H5	D1	H	H4	H3		H6
Single- Phase 200 V Class	BA0001F	56	118	68	128	76	3	5	6,5	149,5	20	4	1,5	0,8
	BA0002F	56	118	68	128	76	3	5	6,5	149,5	20	4	1,5	0,8
	BA0003F	56	118	68	128	118	5	5	39	149,5	20	4	1,5	1,2
Three- Phase 200 V Class	2A0001F	56	118	68	128	75	3	5	6,5	149,5	20	4	1,5	0,8
	2A0002F	56	118	68	128	75	3	5	6,5	149,5	20	4	1,5	0,8
	2A0004F	56	118	68	128	108	5	5	39	149,5	20	4	1,5	1,1
	2A0006F	56	118	68	128	128	5	5	59	149,5	20	4	1,5	1,3



* inner diameter for M4 screws

Voltage Class	Drive Model CIMR- VC	Dimensions in mm											Weight (kg)	
		W1	H2	W	H1	D	t1	H5	D1	H	H4	H3		H6
Single- Phase 200 V Class	BA0006F	96	118	108	128	137,5	5	5	58	149,5	20	4	1,5	1,9
	BA0010F	96	118	108	128	154	5	5	58	149,5	20	4	1,5	2,0
	BA0012F	128	118	140	128	163	5	5	65	153	20	4,8	5	2,6
	BA0018F	158	118	170	128	180	5	5	65	171	38	4,8	5	3,3
Three- Phase 200 V Class	2A0010F	96	118	108	128	129	5	5	58	149,5	20	4	1,5	1,9
	2A0012F	96	118	108	128	137,5	5	5	58	149,5	20	4	1,5	1,9
	2A0020F	128	118	140	128	143	5	5	65	153	20	4,8	5	2,6
Three- Phase 400 V Class	4A0001F	96	118	108	128	81	5	5	10	149,5	20	4	1,5	1,2
	4A0002F	96	118	108	128	99	5	5	28	149,5	20	4	1,5	1,4
	4A0004F	96	118	108	128	137,5	5	5	58	149,5	20	4	1,5	1,9
	4A0005F	96	118	108	128	154	5	5	58	149,5	20	4	1,5	1,9
	4A0007F	96	118	108	128	154	5	5	58	149,5	20	4	1,5	1,9
	4A0009F	96	118	108	128	154	5	5	58	149,5	20	4	1,5	1,9
	4A0011F	128	118	140	128	143	5	5	65	153	20	4,8	5	2,6



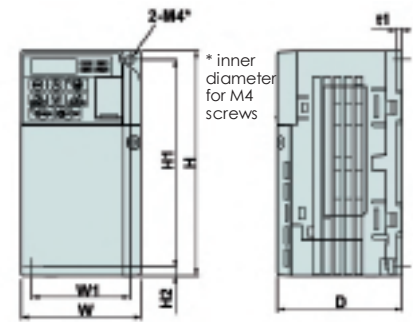
* inner diameter for M5/ M6 screws

Voltage Class	Drive Model CIMR- VC	Dimensions in mm											Weight(kg)		
		W1	H2	W	H1	D	t1	H5	D1	H	H4	H3		H6	d
Three- Phase 200 V Class	2A0030F	122	248	140	234	140	5	13	55	254	13	6	1,5	M5	3,8
	2A0040F	122	248	140	234	140	5	13	55	254	13	6	1,5	M5	3,8
	2A0056F	160	284	180	270	163	5	13	75	290	15	6	1,5	M5	5,5
	2A0069F	192	336	220	320	187	5	22	78	350	15	7	1,5	M6	9,2
Three- Phase 400 V Class	4A0018F	122	248	140	234	140	5	13	55	254	13	6	1,5	M5	3,8
	4A0023F	122	248	140	234	140	5	13	55	254	13	6	1,5	M5	3,8
	4A0031F	160	284	180	270	143	5	13	55	290	15	6	1,5	M5	5,2
	4A0038F	160	284	180	270	143	5	13	75	290	15	6	1,5	M5	5,5

V1000 Series Finless Version Dimensions

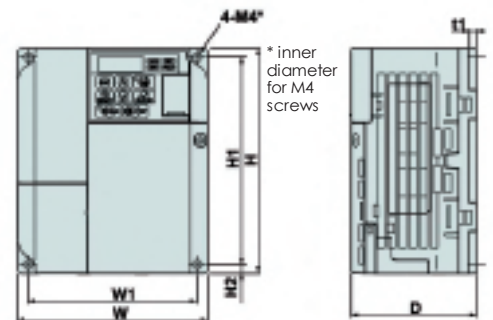
... for Models BA0001~2A0006

Voltage Class	Drive Model CIMR- VC	Dimensions in mm							
		W	H	D	W1	H1	H2	t1	Weight (kg)
Single- Phase 200 V Class	BA0001	68	128	71	56	118	5	3	0,6
	BA0002	68	128	71	56	118	5	3	0,6
	BA0003	68	128	81	56	118	5	3	0,8
Three- Phase 200 V Class	2A0001	68	128	71	56	118	5	3	0,6
	2A0002	68	128	71	56	118	5	3	0,6
	2A0004	68	128	71	56	118	5	3	0,7
	2A0006	68	128	71	56	118	5	3	0,7



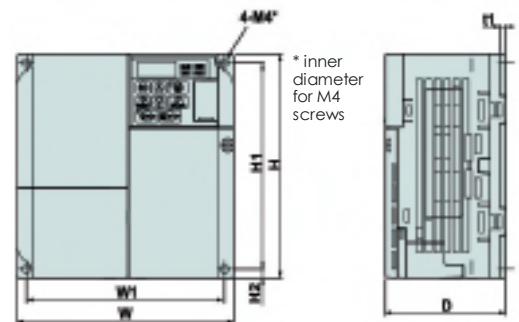
... for Models BA0006~4A0009

Voltage Class	Drive Model CIMR- VC	Dimensions in mm							
		W	H	D	W1	H1	H2	t1	Weight (kg)
Single- Phase 200 V Class	BA0006	108	128	79,5	96	118	5	4	1,1
	BA0010	108	128	91	96	118	5	4	1,1
Three- Phase 200 V Class	2A0008	108	128	71	96	118	5	4	1,0
	2A0010	108	128	71	96	118	5	4	1,0
	2A0012	108	128	79,5	96	118	5	4	1,0
Three- Phase 400 V Class	4A0001	108	128	71	96	118	5	4	0,9
	4A0002	108	128	71	96	118	5	4	0,9
	4A0004	108	128	79,5	96	118	5	4	1,0
	4A0005	108	128	96	96	118	5	4	1,0
	4A0007	108	128	96	96	118	5	4	1,1
	4A0009	108	128	96	96	118	5	4	1,1



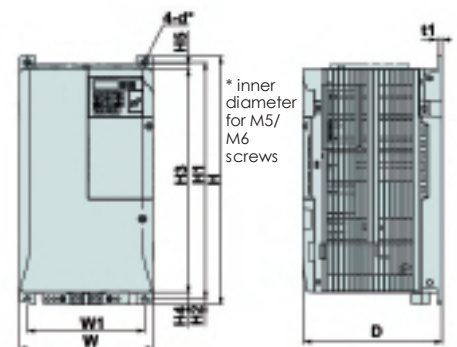
... for Models BA0012~4A0011

Voltage Class	Drive Model CIMR- VC	Dimensions in mm							
		W	H	D	W1	H1	H2	t1	Weight (kg)
Single- Phase 200 V Class	BA0012	140	128	98	128	118	5	4	1,4
Three- Phase 200 V Class	2A0018	140	128	78	128	118	5	4	1,3
	2A0020	140	128	78	128	118	5	4	1,3
Three- Phase 400 V Class	4A0011	140	128	78	128	118	5	4	1,3



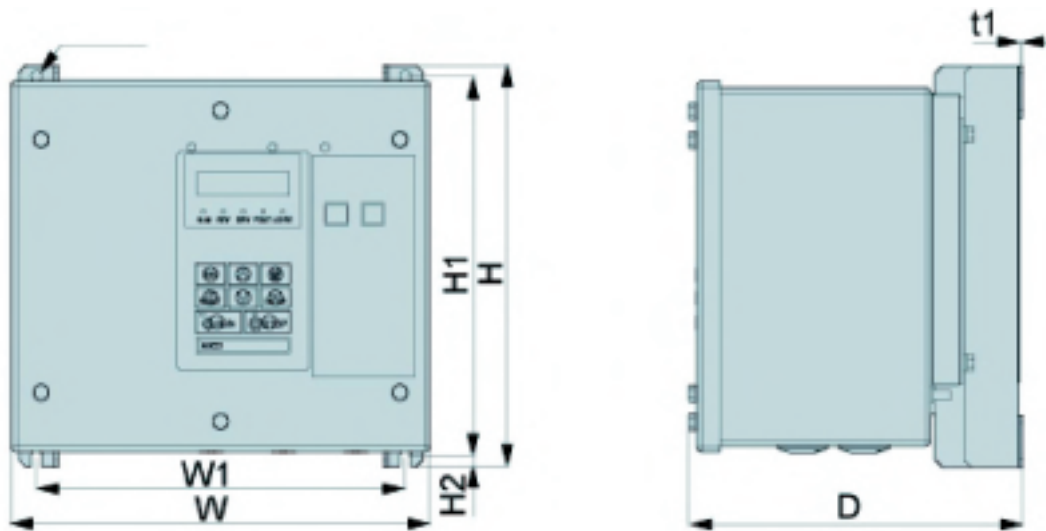
... for Models 2A0030~4A0038

Voltage Class	Drive Model CIMR- VC	Dimensions in mm											
		W	H	D	W1	H1	H2	H3	H4	H5	d	t1	Weight(kg)
Three-Phase 200 V Class	2A0030	140	260	145	122	248	6	234	13	5	M5	5	3,2
	2A0040	140	260	145	122	248	6	234	13	5	M5	5	3,2
	2A0056	180	300	147	160	284	8	270	15	5	M5	5	4,6
	2A0069	220	350	152	192	336	7	320	15	5	M6	5	7
Three-Phase 400 V Class	4A0018	140	260	145	122	248	6	234	13	5	M5	5	3,1
	4A0023	140	260	145	122	248	6	234	13	5	M5	5	3,2
	4A0031	180	300	147	160	284	8	270	15	5	M5	5	4,3
	4A0038	180	300	147	160	284	8	270	15	5	M5	5	4,6



V1000 Series Dimensions

IP 66 Dimensions



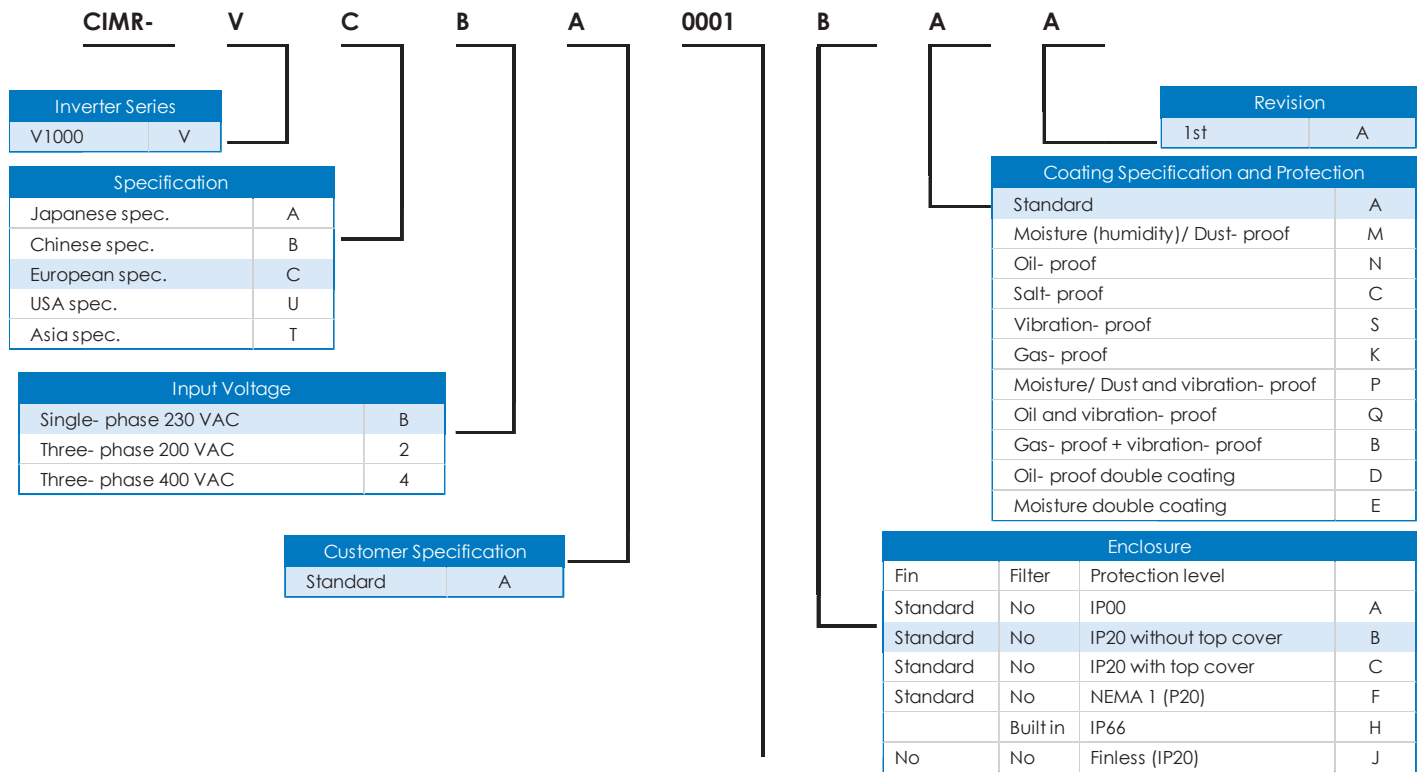
Inverter Model VC	Dimensions in mm							Weight (kg)
	W	H	D	W1	H1	H2	t1	
BA0001HAA	232	222	185	204,5	210	6	2	5,6
BA0002HAA	232	222	185	204,5	210	6	2	5,6
BA0003HAA	232	222	185	204,5	210	6	2	5,8
BA0006HAA	257	255	235	227,5	241	7	2	8,0
BA0010HAA	257	255	235	227,5	241	7	2	8,0
BA0012HAA	257	255	235	227,5	241	7	2	8,3
2A0001HAA	232	222	185	204,5	210	6	2	5,6
2A0002HAA	232	222	185	204,5	210	6	2	5,6
2A0004HAA	232	222	185	204,5	210	6	2	5,7
2A0006HAA	232	222	185	204,5	210	6	2	5,7
2A0010HAA	257	255	235	227,5	241	7	2	7,9
2A0012HAA	257	255	235	227,5	241	7	2	7,9
2A0020HAA	257	255	235	227,5	241	7	2,5	9,2
2A0030HAA	385	420	305	360	400	8,5	2,5	28,1
2A0040HAA	385	420	305	360	400	8,5	2,5	28,1
4A0001HAA	232	222	185	204,5	210	6	2	5,9
4A0002HAA	232	222	185	204,5	210	6	2	5,9
4A0004HAA	232	222	185	204,5	210	6	2	6,0
4A0005HAA	257	255	235	227,5	241	7	2,5	8,9
4A0007HAA	257	255	235	227,5	241	7	2,5	8,9
4A0009HAA	257	255	235	227,5	241	7	2,5	8,9
4A0011HAA	257	255	235	227,5	241	7	2,5	9,2
4A0018HAA	385	420	305	360	400	8,5	2,5	27,9
4A0023HAA	385	420	305	360	400	8,5	2,5	28,0
4A0031HAA	385	420	305	360	400	8,5	2,5	29,1
4A0038HAA	385	420	305	360	400	8,5	2,5	29,4

Data and Dimensions are preliminary and subject to be changed at any time.

V1000 Series Options

Name	Purpose	Model, Manufacturer
Input noise filter	Reduces noise from the line that enters into the drive input power system. Should be installed as close as possible to the drive.	FS23638- - (Single- Phase 200 V) FS23637- - (Three- Phase 200 V) FS23639- - (Three Phase 400 V)
Braking resistor	Used to shorten the deceleration time by dissipating regenerative energy through a resistor (3% ED).	ERF- 150WJ series
Braking resistor unit	Used to shorten the deceleration time by dissipating regenerative energy through a resistor. A thermal overload relay is built in (10% ED).	LKEB series
24 V power supply	Provides power supply for the control circuit and option boards. Note: Parameter settings cannot be changed when the drive is operating solely from this power supply.	PS- V10S PS- V10M
USB copy unit (RJ-45/ USB compatible plug)	Adapter for connecting the drive to the USB port of a PC.(e.g. for Support Tool Drive Wizard Plus) Can copy parameter settings to be later transferred to another drive.	JVOP-181
Support tools (DriveWizard Plus) cable	Connects the drive to a PC for use with DriveWizard.	WV103
LCD operator	For easier operation when using the optional LCD operator. Allows for remote operation. Includes a Copy function for saving drive settings.	JVOP-180
LCD operator extension cable	Cable for connecting the LCD operator.	WV001: 1 m WV003: 3 m
Communication interface unit	MECHATROLINK-2	Available soon
	CC-link	SI- C3/ V
	DeviceNet	SI- N3/ V
	PROFIBUS -DP	SI- P3/ V
	CANopen	SI- S3/ V
LONWORKS	Available soon	
Momentary power loss recovery unit	Ensures continued drive operation for a power loss of up to 2 s.	P0010 type (200 V class) P0020 type (400 V class)
Attachment for external heatsink	Mechanical kit to install the drive with the heatsink out of the cabinet. Note: current derating must be considered when this installation method is used.	(Please contact your YASKAWA representative)
Screw- type terminal board	Control terminal board with screw- type terminals.	Available soon
Plus operator mounting kit	For the use with holes through the panel.	100-039-992
	For the use with panel mounted threaded studs.	100-039-993

V1000 Series Rating & Type Descriptions



Single- phase 230 VAC				
	Normal duty		Heavy duty	
	Rated output current	Max.applicable motor	Rated output current	Max.applicable motor
0001	1,2	0,18KW	0,8A	0,1KW
0002	1,9A	0,37KW	1,6A	0,18KW
0003	3,3A	0,75KW	3,0A	0,55KW
0006	6,0A	1,1KW	5,0A	0,75KW
0010	9,6A	2,2KW	8,0A	1,5KW
0012	12,0A	3,0KW	11,0A	2,2KW
0018	-	-	17,5A	4,0KW

Three- phase 200 VAC				
	Normal duty		Heavy duty	
	Rated output current	Max.applicable motor	Rated output current	Max.applicable motor
0001	1,2A	0,4KW	0,8A	0,1KW
0002	1,9A	0,37KW	1,6A	0,2KW
0004	3,5A	0,75KW	3,0A	0,4KW
0006	6,0A	1,1KW	5,0A	0,75KW
0010	9,6A	2,2KW	8,0A	1,5KW
0012	12,0A	3,0KW	11,0A	2,2KW
0020	19,6A	5,5KW	17,5A	4,0KW
0030	30,0A	7,5KW	25,0A	5,5KW
0040	40,0A	11,0KW	33,0A	7,5KW
0056	56,0A	15,0KW	47,0A	11,0KW
0069	69,0A	18,5KW	60,0A	15,0KW

Three- phase 400 VAC				
	Normal duty		Heavy duty	
	Rated output current	Max.applicable motor	Rated output current	Max.applicable motor
0001	1,2A	0,37KW	1,2A	0,2KW
0002	2,1A	0,75KW	1,8A	0,4KW
0004	4,1A	1,5KW	3,4A	0,75KW
0005	5,4A	2,2KW	4,8A	1,5KW
0007	6,9A	3,0KW	5,5A	2,2KW
0009	8,8A	4,0KW	7,2A	3,0KW
0011	11,1A	5,5KW	9,2A	4,0KW
0018	17,5A	7,5KW	14,8A	5,5KW
0023	23,0A	11,0KW	18,0A	7,5KW
0031	31,0A	15,0KW	24,0A	11,0KW
0038	38,0A	18,5KW	31,0A	15,0KW

A1000 Series



Main features:

- For Induction Motor and Permanent Magnet Motor Control:
The A1000 is a premium inverter drive for a wide field of applications including great advantages in more than one way
- Providing newest Safety Features:
Safety features of the A1000 comply with today's market safety requirements and standards
- For Easy Start- up and Reliable Operation:
YASKAWA A1000 provides significant costs reduction potentials during installation and operation
- Improved Drive Design & Functions:
Small size and application oriented design improve performance, reliability and performance life
- Enhanced Efficiency & Environment:
Using the A1000 saves energy and reduces audible noise

Permanent Magnet Motor Control

- Open loop position control (No Motor Feedback)
- 200% rated torque at 0 rpm
- New Auto- Tuning Features
- Tuning of the Speed Loop according to Load
- Power Loss Recovery

Safety Features & Communication

- Safety Torque Off (STO) according to EN954-1 safety category 3, stop category 0; EN ISO 13849-1 PLC; IEC EN 61508 SiL2
- External Device Monitor (EDM) to Observe the Safety Status

Easy Start- up & Reliable Operation

- Application Parameter Presets
- Screwless Removable Control Terminal with Parameter Backup
- Online Auto- Tuning for Motor Parameter
- Tuning of the Speed Loop according to Load
- Parameter Copy and Backup Function
- Engineering Tool Drive Wizard Plus for Parameter Management
- Application SW Library
- Performance Life Diagnostics for all major inverter components

Drive Design & Functions

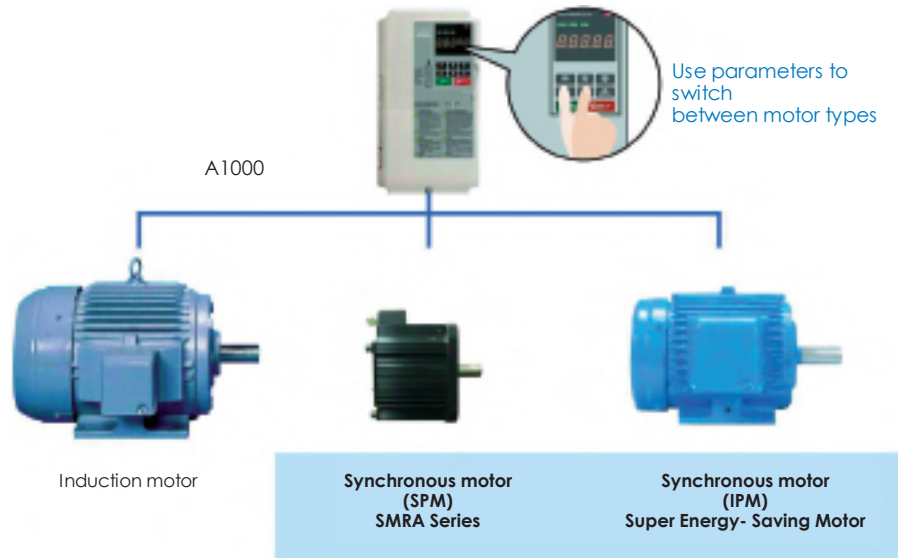
- Even more compact
- Side- by- Side Mounting
- Dual Rating for Cost & Space Saving
- Long Performance Life
- Overexcitation Braking to reduce Deceleration Time

Efficiency & Environment

- Advanced Energy Saving Functionality
- Unique PWM function reduces audible noise.
- Minimum Power Loss in Normal Duty Rating

A1000 Series Advanced Drive Technology

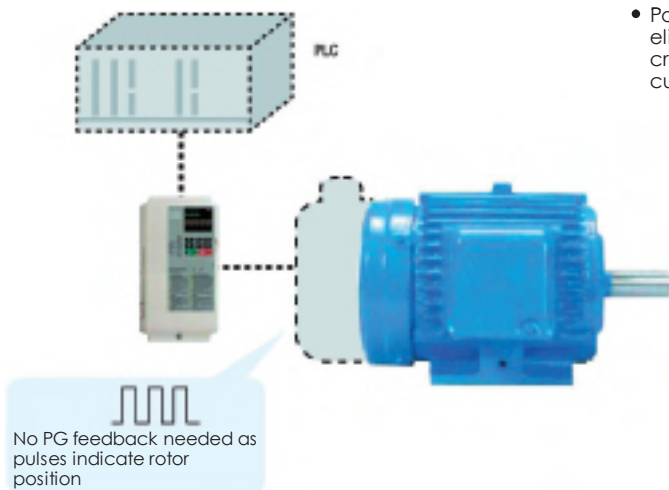
- Capable of driving different types of motor. A1000 runs not only induction motors, but also synchronous motors like IPM and SPM motors with high performance open and closed loop vector control.
- Minimize equipment needed for your business by using the same drive to run induction and synchronous motors.



¹ Interior Permanent Magnet Motor (Motors with permanent magnets inserted into the rotor)
² Surface Mounted Permanent Magnet Motor (Motors with permanent magnets mounted on the surface of the rotor)

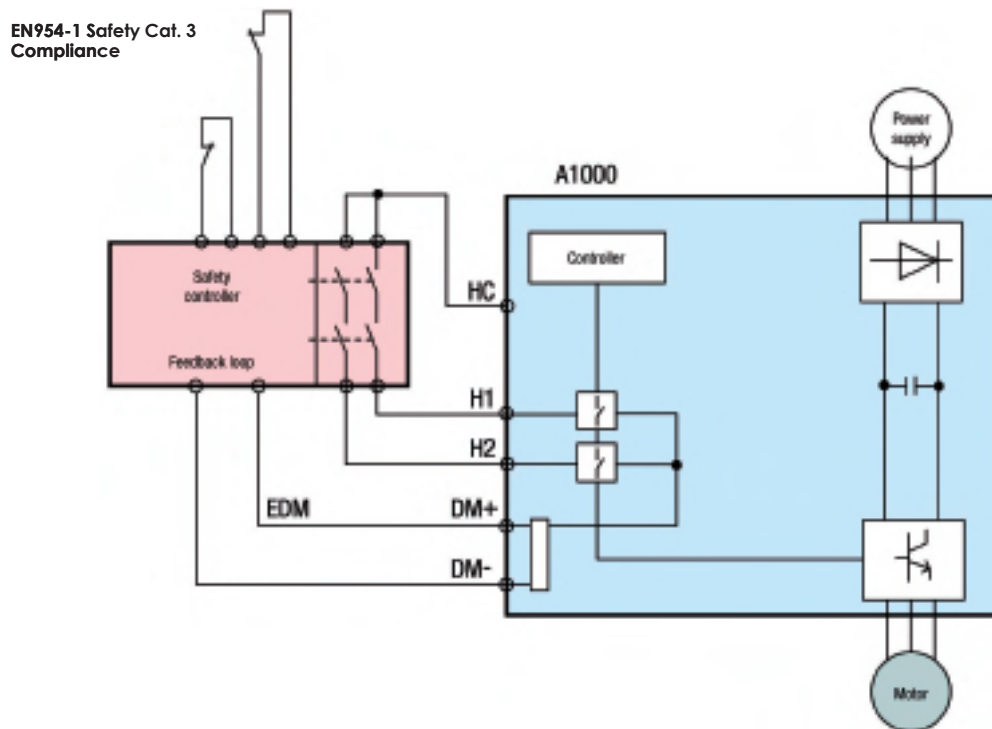
Positioning Capability without External Devices

- Use an IPM motor to perform position control –without motor feedback. Electrical saliency in IPM motors makes it possible to detect speed, direction and rotor position without the use of external feedback devices.
- Positioning functionality without a PLC. Visual programming in DriveWorksEZ eliminates the need for external controllers by giving the user the power to create customized functions such as position control.



A1000 Series Safety features as a Standard

- A1000 provides Safe Torque Off (STO) functional safety in compliance with EN954-1 safety category 3 stop category 0, EN ISO 13849-1, PLC, IEC/ EN61508 SIL2.
- An External Device Monitor (EDM) function has also been added to monitor the safety status of the drive.



All Major Serial Communication Protocols

- RS-422/485 (MEMOBUS/ Modbus at 115.2 kbps) standard on all models.
- Option cards available for all major fieldbuses used across the globe:



* Registered trademarks of those companies.

A1000 Series Easy start-up and reliable operation

Application Parameter Presets

- A1000 automatically sets parameters needed for major applications. Selecting the appropriate application optimizes the drive for top performance, while saving time for set up.

Setting	Setting
00	General-purpose
01	Water Supply Pump
02	Conveyor
03	Exhaust Fan
04	HVAC Fan
05	Air Compressor
06	Crane (Hoist)
07	Crane (Traverse)

Parameters are programmed automatically

A1-02	Control mode selection
C1-01	Accel Time 1
C1-02	Decel Time
C6-01	ND/HD Selection

Example using Application Presets
Selecting "Conveyor" optimizes parameter settings so the drive is ready to start your conveyor application immediately

Multifunction Terminal Block

- The first terminal board with a Parameter Backup Function. The terminal block's ability to save parameter setting data makes it easy to get the application back online in the event of a failure requiring drive replacement.

A1000 Terminal Block

Parameter		
Name	Number	Setting
ND/ HD	C6-01	1
Control Mode	A1-02	0
Frequency Reference Selection	b1-01	1
Run Command Selection	b1-02	1

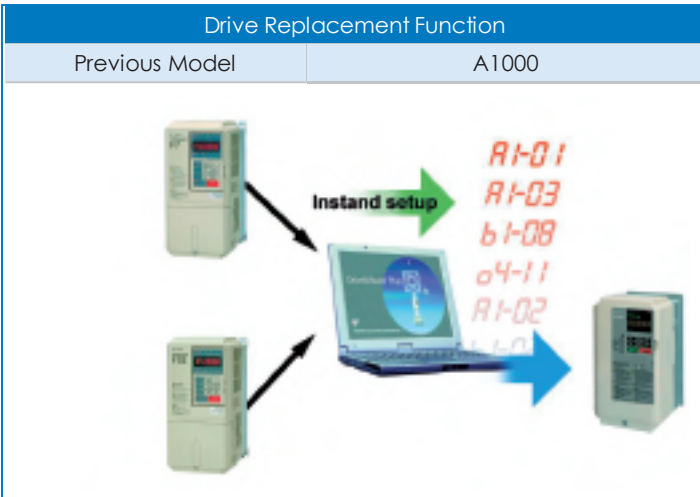
A1000 Series

Parameter Copy Function

- All standard models are equipped with a Parameter Copy Function that allows parameter settings to be easily copied from the drive or uploaded for quick setup using the operator.
- A USB Copy Unit is also available as an even faster, more convenient way to back up settings and instantly program the drive.



Engineering Tool DriveWizard Plus



- Engineering Tool DriveWizard Plus
- 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.
- The Drive Replacement feature in Drive Wizard Plus saves valuable time during equipment replacement and application upgrades by converting previous Yaskawa product parameter values to the new A1000 parameters automatically.

Note: To obtain a copy of DriveWizard Plus, contact a YASKAWA representative.

A1000 Series Standard Specifications

	Item	Specifications
Control	Control method	V/ f Control, V/ f Control with PG, Open Loop Vector Control, Closed Loop Vector Control with PG, Open Loop Vector for PM, Closed Loop Vector for PM, Advanced Open Loop Vector for PM
Characteristics	Frequency Control Range	0.01 to 400 Hz
	Frequency Accuracy (Temperature Fluctuation)	Digital referece: within ±0.01% of the max. output frequency (-10 to +40°C) Analog referece: within ±0.1% of the max. output frequency (25°C ±10°C)
	Frequency Setting Resolution	Digital referece: 0.01 Hz Analog referece: 0.03 Hz / 60 Hz (11 bit)
	Output Frequency Resolution	0.001 Hz
	Frequency Setting Resolution	-10 to +10 V, 0 to +10 V, 4 to 20 mA, Pulse Train
	Starting Torque	150%/3 Hz (V/ f Control and V/ f Control with PG), 200%/0.3 Hz ¹ (Open Loop Vector Control), 200%/0 r/ min*1 (Closed Loop Vector Control, Closed Loop Vector Control for PM, and Advanced Open Loop Vector Control for PM), 100%/5% speed (Open Loop Vector Control for PM)
	Speed Control Range	1:1500 (Closed Loop Vector Control and Closed Loop Vector for PM) 1:200 (Open Loop Vector Control) 1:40 (V/ f Control and V/ f Control with PG) 1:20 (Open Loop Vector for PM) 1:100 (Advanced Open Loop Vector for PM)
	Speed Control Accuracy	±0.2% in Open Loop Vector Control (25°C ±10°C) ² , 0.02% in Closed Loop Vector Control (25°C ±10°C)
	Speed Response	10 Hz in Open Loop Vector (25°C ±10°C), 50 Hz in Closed Loop Vector Control (25°C ±10°C) (excludes temperature fluctuation when performing Rotational Auto- Tuning)
	Torque Limit	All Vector Control allows separate settings in four quadrants
	Accel/ Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
	Braking Torque	Drives of 200/400 V 30 kW or less have a built- in braking transistor. 1. Short- time decel torque ³ : over 100% for 0.4/ 0.75 kW motors, over 50% for 1.5 kW motors, and over 20% for 2.2 kW and above motors (over excitation braking/ High- Slip Braking: approx. 40%) 2. Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option ⁴ : 10% ED, 10s, internal braking transistor)
	V/ f Characteristics	User- selected programs and V/ f preset patterns possible
Main Control Functions	Torque control, Droop control, Speed/ torque control switching, Feedforward control, Zero- servo control, Momentary power loss ride- thru, Speed search, Overtorque detection, Torque limit, 17- step speed (max), Accel/ decel time switch, S- curve accel/ decel, 3- wire sequence, Auto- tuning (rotational, stationary), Online tuning, Dwell, Cooling fan on/ off switch, Slip compensation, Torque compensation, Frequency jump, Upper/ lower limits for frequency reference, DC injection braking at start and stop, Overexcitation braking, High slip braking, PID control (with sleep function), Energy saving control, MEMOBUS comm. (RS-485/422 max, 115.2 kbps), Fault restart, Application presets, DriveWorksEZ (customized function), Removable terminal block with parameter backup function...	
Protection Function	Motor Protection	Motor overheat protection based on output current
	Momentary Overcurrent Protection	Drive stops when output current exceeds 200% of Heavy Duty Rating
	Overload Protection	Drive stops after 60 s at 150% of rated output current (Heavy Duty Rating) ⁵
	Overvoltage Protection	200 V class: Stops when DC bus exceeds approx. 410 V, 400 V class: Stops when DC bus exceeds approx. 820 V
	Undervoltage Protection	200 V class: Stops when DC bus exceeds approx. 190 V, 400 V class: Stops when DC bus exceeds approx. 380 V
	Momentary Power Loss Ride- Thru	Immediately stop after 15 ms or longer power loss (default). Continuous operation during power loss than 2 s (standard)*6
	Heatsink Overheat Protection	Thermistor
	Braking Resistance Overheat Protection	Overheat sensor for braking resistor (optional ERF- type, 3% ED)
	Stall Prevention	Stall prevention during acceleration/ deceleration and constant speed operation
	Ground Fault Protection	Protection by electronic circuit ⁷
	Charge LED	Charge LED remains lit until DC bus has fallen below approx. 50 V
Operating Environmen	Area of Use	Indoors
	Ambient Temperature	-10 to +50°C (open chassis), -10 to +40°C (NEMA Type 1)
	Humidity	95% RH or less (no condensation)
	Storage Temperature	-20 to +60°C (short- term temperature during transportation)
	Altitude	Up to 1000 meters (output derating of 1% per 100 m above 1000 m, max. 3000 m)
	Shock	10 Hz to 20 Hz, 9.8 m/ s ² max. 20 Hz to 55 Hz, 5.9 m/ s ² (200 V: 45 kW or more, 400 V: 55 kW or more) or 2.0 m/ s ² max. (200 V: 55 kW or less, 400 V: 75 kW or less)
	Safety Standard	EN954-1 safe category 3 stop category 0; EN ISO 13849-1; IEC EN 61508 SIL2
	Protection Design	IP00 open- chassis, IP20, NEMA Type 1 enclosure

*1: Requires a drive with recommended capacity.

*2: Speed control accuracy may vary slightly depending on installation conditions or motor used. Contact Yaskawa for details.

*3: Momentary average deceleration torque refers to the deceleration torque from 60 Hz down to 0 Hz. This may vary depending on the motor.

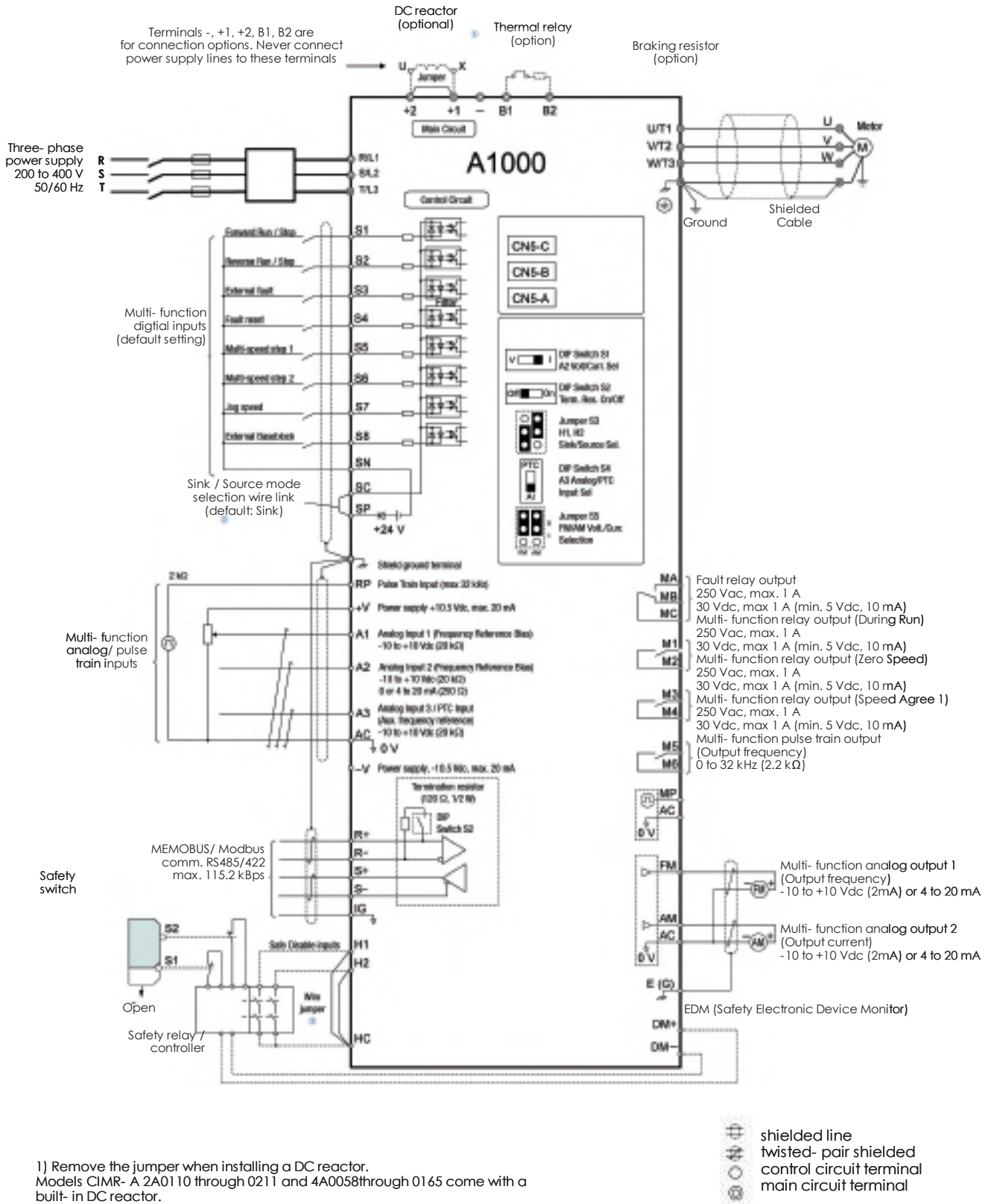
*4: If L3-04 is enabled when using a braking resistor or braking resistor unit, the motor may not stop within the specified deceleration time.

*5: Overload protection may be triggered when operating with 150% of the rated output current if the output frequency is less than 6 Hz.

*6: Varies in accordance with drive capacity and load. Drives with a capacity of smaller than 11 kW in the 200 V (model: CIMR- AA0056) or 400 V (model: CIMR- AA0031) require a separate Momentary Power Loss Recovery Unit to continue operating during a momentary power loss of 2 s or longer.

*7: Protection may not be provided under the following conditions as the motor windings are grounded internally during run: • Low resistance to ground from the motor cable or terminal block. • Drive already has a short- circuit when the power is turned on.

A1000 Series Connection Diagram



1) Remove the jumper when installing a DC reactor. Models CIMR- A 2A01 10 through 0211 and 4A0058 through 0165 come with a built-in DC reactor.

2) Never short terminals SP and SN as doing so will damage the drive.

3) Disconnect the wire jumper between H1-HC and H2-HC when utilizing the Safe Disable input.

A1000 Series Terminal functions

Main Circuit Terminals

Voltage	200 V			400 V		
Model CIMR- AA2A	2A0004 to 2A0081	2A0110, 2A0138	2A0169, 2A0211	4A0002 to 4A0044	4A0058, 4A0072	4A0088 to 4A0165
Max. Applicable Motor Capacity*1 kW	0.4 to 18.5	22, 30	37, 45	0.4, 18.5	22, 30	37 to 75
R/ L1	Main circuit input power supply			Main circuit input power supply		
S/ L2						
T/ L3						
U/ T1	Drive output			Drive output		
V/ T2						
W/ T3						
B1	Braking resistor unit		-	Braking resistor unit		-
B2						
(-)	DC reactor (Ⓢ1-Ⓢ2)	DC power supply (Ⓢ1-Ⓢ) ² Braking unit (Ⓢ3-(-))		DC reactor (Ⓢ1-Ⓢ2)	DC power supply (Ⓢ1-(-)) ² Braking unit (3-(-)) ²	
(+) 1	DC power supply (Ⓢ1-(-)) ²					
(+) 2	-					
(+) 3	-			-		
	Ground terminal (100 Ω or less)			Ground terminal (10 Ω or less)		

*1: Max. Applicable Motor Capacity indicates Heavy Duty ²: DC power supply input terminals (+1, -) are not UL/ cUL and CE certified. Note: A dash, (-), indicates no applicable terminals.

Control Circuit Input Terminals (200 V/400 V Class)

Type	Terminal	Terminal Name (Function)	Function (Signal Level) Default Setting
Safe Disable Inputs	H1	Safe Disable input 1	24 Vdc, 8 mA
	H2	Safe Disable input 2	One or both open: Drive output disabled Both closed: Normal operation Internal impedance: 3.3 kΩ Off time of at least 1 ms Disconnect the wire jumpers shorting terminals H1, H2, and HC to use the Safe Disable inputs. Set the S3 jumper to select between sinking, sourcing mode, and the power supply.
	HC	Safe Disable function common	Safe disable function common
Analog Inputs / Pulse Train Input	RP	Multi- function pulse train input (Frequency reference)	Input frequency range: 0 to 32 kHz Signal Duty Cycle: 30 to 70% High level: 3.5 to 13.2 Vdc, low level: 0.0 to 0.8 Vdc Input impedance: 3 kΩ
	+V	Power supply for analog inputs	10.5 Vdc (max allowable current 20 mA)
	-V	Power supply for analog inputs	-10.5 Vdc (max allowable current 20 mA)
	A1	Multi- function analog input 1 (Frequency reference bias)	-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kΩ)
	A2	Multi- function analog input 2 (Frequency reference bias)	-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kΩ) 4 to 20 mA, 0 to 20 mA (input impedance: 250 Ω) Voltage or current input must be selected by DIP switch S1 and H3-09
	A3	Multi- function analog input 3 / PTC Input (Auxiliary frequency reference)	-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kΩ) Use switch S4 on the control terminal board to select between analog input or PTC input. If PTC is selected, set H3-06 = E.
	AC	Frequency reference common	0 V
E(G)	Ground for shielded lines and option cards	-	
Fault Relay	MA	N.O.	Dry contact, contact capacity
	MB	N.C. output	30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A
	MC	Fault output common	Minimum load: 5 Vdc, 10 mA
Multi-Function Digital Output	M1	Multi- function digital output (During run)	Dry contact, contact capacity
	M2	Multi- function digital output (Zero speed)	30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A
	M3	Multi- function digital output (Zero speed)	30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A
	M4	Multi- function digital output (Speed agree 1)	Minimum load: 5 Vdc, 10 mA
	M5	Multi- function digital output (Speed agree 1)	Minimum load: 5 Vdc, 10 mA
	M6	Multi- function digital output (Speed agree 1)	Minimum load: 5 Vdc, 10 mA
Monitor Output	MP	Pulse train output (Output frequency)	32 kHz (max)
	FM	Analog monitor output 1 (Output frequency)	-10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA
	AM	Analog monitor output 2 (Output current)	Use jumper S5 on the control terminal board to select between voltage or current output at terminals AM and FM. Set parameters H4-07 and H4-08 accordingly when changing the jumper setting.
	AC	Monitor common	jumper setting.
Safety monitor output	DM +	Safety monitor output	Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed.
	DM-	Safety monitor output common	Up to +48 Vdc 50 mA

* Sequence Input changes in accordance with the sinking mode/ source mode selection.

Serial Communication Terminals (200 V/400 V Class)

Classification	Terminal	Signal Function	Description	Signal Level
RS-485/422 Transmission	R +	MEMOBUS communications Read	When using RS-422 two wires communication, short-circuit between R + and S +, R- and S-	Differential input PHC isolation
	R-	MEMOBUS communications Read		
	S +	MEMOBUS communications send	Differential output PHC isolation	
	S-	MEMOBUS communications send		
	IG	Communications output	-	-

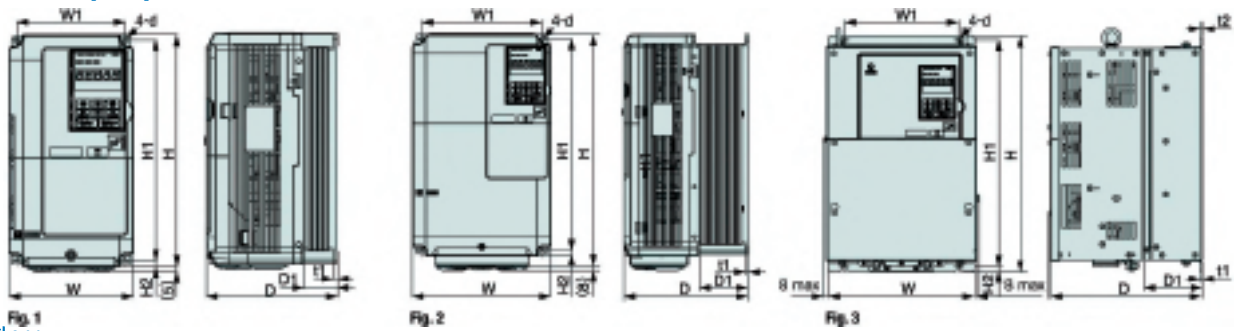
A1000 Series Dimensions

Enclosures

Enclosures of standard products vary depending on the model. Refer to the table below.

200 V Class																					
Model CIMR- AC2A		0004	0006	0008	0010	0012	0018	0021	0030	0040	0069	0081	0110	0138	0169	0211	0250	0312	0360	0415	
Max. Applicable Motor Capacity [kW]	Normal Duty	0,75	1,1	1,5	2,2	3	4	5,5	7,5	11	18,5	22	30	37	45	55	75	90	110	110	
	Heavy Duty	0,4	0,75	1,1	1,5	2,2	3	4	5,5	7,5	15	18,5	22	30	37	45	55	75	90	110	
Enclosure Panel [NEMA Type1]		Standard												on request							
Open- Chassis (IP00)		Without top and bottom covers												Standard							
400 V Class																					
Model CIMR- AC4A		0005	0007	0009	0011	0023	0031	0038	0044	0058	0072	0088	0103	0139	0165	0208	0296	0362	0414	0515	0675
Max. Applicable Motor Capacity [kW]	Normal Duty	2,2	3	4	5,5	11	15	18,5	22	30	37	45	55	75	90	110	160	185	220	250	355
	Heavy Duty	1,5	2,2	3	4	7,5	11	15	18,5	22	30	37	45	55	75	90	132	160	185	220	315
Enclosure Panel [NEMA Type1]		Standard												on request							
Open- Chassis (IP00)		Without top and bottom covers												Standard							

Open- Chassis [IP00]



200 V Class

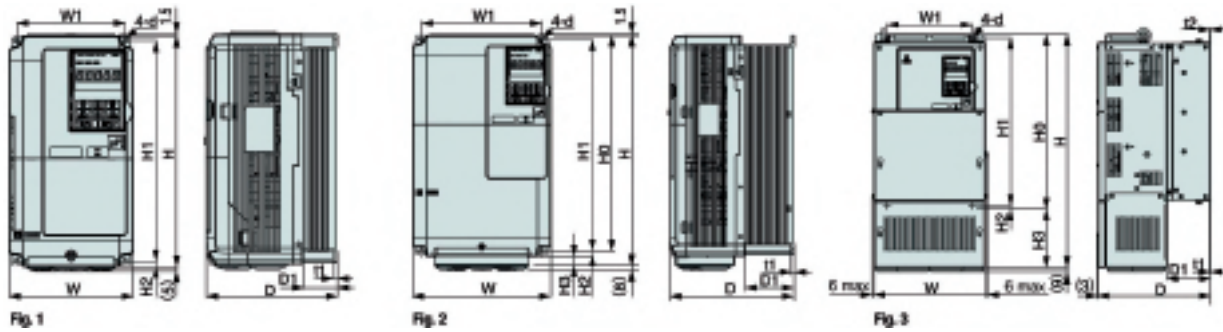
Model	Max. applicable motor capacity [kW]		Figure	Dimensions in mm											Weight (kg)	Cooling			
	CIMR- AC2A	Normal duty		Heavy duty	W	H	D	W1	H1	H2	D1	t1	t2	d					
4	0,75	0,4	Fig.1	140	260	147	122	248	6	38	5	-	4- M5	3,1	Self cooling				
6	1,1	0,75				164								3,2					
10	2,2	1,5				167								3,5					
12	3	2,2												4					
21	5,5	4																	
30	7,5	5,5																	
40	11	7,5	Fig.2	180	300	187	160	284	8	75	-	-	-	5,6	Fan cooled				
56	15	11				192								335		78	8,7		
69	18,5	15				365								9,7					
81	22	18,5	Fig.3	250	400	258	195	385	7,5	100	2,3	2,3	4- M6	21					
110	30	22				275								450		220	435	110	25
138	37	30				325								550		283	260	535	37
169	45	37															38		
211	55	45	Fig.3	450	705	330	325	680	12,5	130	3,2	3,2	4- M10	76					
250	75	55																80	
312	90	75																98	
360	110	90	Fig.3	500	800	350	370	773	13	-	4,5	4,5	4- M12	99					
415	110	110																	

400 V Class

Model	Max. applicable motor capacity [kW]		Figure	Dimensions in mm											Weight (kg)	Cooling									
	CIMR- AC4A	Normal duty		Heavy duty	W	H	D	W1	H1	H2	D1	t1	t2	d											
0002	0,75	0,4	Fig.1	140	260	147	122	248	6	38	5	-	4- M5	3,2	Self cooling										
0004	1,5	0,75				164								3,4											
0005	2,2	1,5				167								3,5											
0007	3	2,2												3,9											
0009	4	3												5,4											
0011	5,5	4												5,7											
0018	7,5	5,5												8,3											
0023	11	7,5												21											
0031	15	11				Fig.2								180		300	187	160	284	8	75	-	-	-	5,7
0038	18,5	15															192								335
0044	22	18,5	365	21																					
0058	30	22	Fig.3	250	400	258	195	385	7,5	100	2,3	2,3	4- M6	25											
0072	37	30				275								450	220	435	110	36							
0088	45	37				325								510	260	495	105	2,3	3,2						
0103	55	45				283								260	535	110	2,3								
0139	75	55	Fig.3	450	705	330	325	680	12,5	130	3,2	3,2	4- M10	41											
0165	90	75												330	330	75	3,2	3,2	42						
0208	110	90																						79	
0250	132	110	Fig.3	500	800	350	370	773	13	-	4,5	4,5	4- M12	96											
0296	160	132																						102	
0362	185	160	Fig.4											107											
0414	220	185												950	370	923	135							125	
0515	250	220	Fig.5											221											
0675	355	315												670	1140	440	1110	15	150						

A1000 Series Dimensions

Enclosure Panel [NEMA Type1]



200 V Class

Model	Max. applicable motor capacity [kW]		Figure	Dimensions in mm											Weight (kg)	Cooling																														
	Normal duty	Heavy duty		W	H	D	W1	H0	H1	H2	H3	D1	t1	t2			d																													
CIMR- AC2A																																														
0004	0,75	0,4	Fig.1	140	260	147	122	-	248	6	-	38	5	-	4-M5		3,1	Self cooling																												
0006	1,1	0,75				3,2																																								
0010	2,2	1,5				3,5																																								
0012	3	2,2				4																																								
0021	5,5	4				5,6																																								
0030	7,5	5,5				8,7																																								
0040	11	7,5				9,7																																								
0056	15	11				23																																								
0069	18,5	15				28																																								
0081	22	18,5				41																																								
0110	30	22	Fig.2	180	300	187	192	350	400	385	7,5	134	100	2,3	2,3	4-M6		42	Fan cooled																											
0138	37	30				45																																								
0169	45	37				83																																								
0211	55	45				88																																								
0250	75	55				108																																								
0312	90	75																																												
0360	110	90																																												
						Fig.3												254		534	258	220	450	435	8	15	180	110	2,3	2,3	4-M10		42	Fan cooled												
0138	37	30																			279												614		258	220	450	435	8	15	180	110	2,3	2,3	4-M10	83
0169	45	37																			329												730		283	260	550	535	7,5	15	180	110	2,3	2,3	4-M10	88
0211	55	45	456	960	330		325	705	608	12,5	255	130	4,5	4,5	4-M12	108																														
0250	75	55	504	1168	350		370	800	773	13	368	130	4,5	4,5	4-M12	108																														

400 V Class

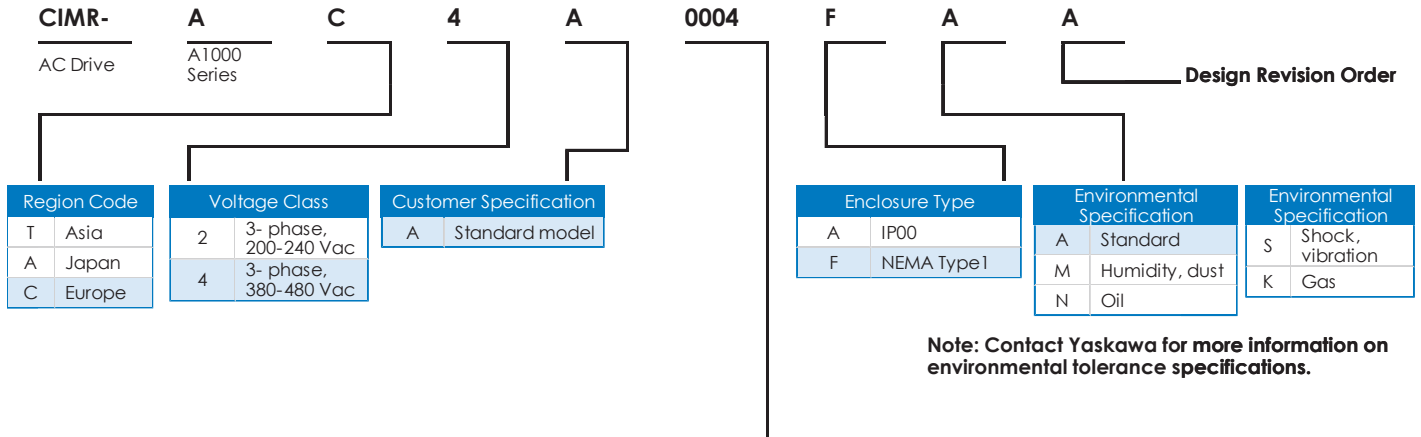
Model	Max. applicable motor capacity [kW]		Figure	Dimensions in mm											Weight (kg)	Cooling																		
	Normal duty	Heavy duty		W	H	D	W1	H0	H1	H2	H3	D1	t1	t2			d																	
CIMR- AC4A																																		
0002	0,75	0,4	Fig.1	140	260	147	122	-	248	55	-	38	5	-	4-M5		3,2	Self cooling																
0004	1,5	0,75				3,4																												
0005	2,2	1,5				3,5																												
0007	3	2,2				3,9																												
0009	4	3				5,4																												
0011	5,5	4				5,7																												
0018	7,5	5,5				8,3																												
0023	11	7,5				23																												
0031	15	11				27																												
0038	18,5	15				39																												
0044	22	18,5	Fig.2	180	300	187	192	350	400	385	8	75	134	100	2,3	2,3	4-M6		46	Fan cooled														
0058	30	22				45																												
0072	37	30				279													515		258	220	450	435	65	435	100	2,3	3,2	4-M6	45			
0088	45	37				329													630		283	260	510	7,5	120	495	105	2,3	3,2	4-M6	46			
0103	55	45				456													960		330	325	705	12,5	255	680	130	3,2	3,2	4-M10	87			
0139	75	55				504													1168		350	370	880	13	368	773	130	4,5	4,5	4-M12	112			
0165	90	75																															106	
0208	110	90																															112	
0250	132	110																															117	
0296	160	132																																
0362	185	160																																

A1000 Series Options

Name	Purpose	Model
Input noise filter	Reduces noise from the line that enters into the drive input power system. Should be installed as close as possible to the drive.	4A0002 AA
		4A0004 AA
		4A0005 AA
		4A0007 AA
		4A0009 AA
		4A0011 AA
		4A0018 AA
		4A0023 AA
		4A0031 AA
		4A0038 AA
		4A0044 AA
		4A0058 AA
		4A0072 AA
		4A0088 AA
		4A0103 AA
4A0139 AA		
4A0165 AA		
4A0208 AA		
4A0250 AA		
AC Chokes	Reducing Harmonics	B06040 Series
Analog input	Enables high- precision and high- resolution analog speed reference setting. <ul style="list-style-type: none"> • Input signal level: -10 to +10 Vdc (20 kΩ) • 4 to 20 mA (500 Ω) • Input channels: 3 channels, DIP switch for input voltage/ input current selection • Input resolution: Input voltage 13 bit signed (1/8192) • Input current 1/6554 	AI- A3
Digital Input	Enables 16- bit digital speed reference setting. <ul style="list-style-type: none"> • Input signal: 16 bit binary, 2 digit BCD + sign signal + set signal • Input voltage: +24 V (isolated) • Input current: 8 mA • Selectable Parameter: 8 bit, 12 bit, 16 bit 	DI- A3
DeviceNet communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller	SI- N3
CC- Link communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through CC-Link communication with the host controller.	SI- C3
CANopen communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI- S3
MECHATROLINK communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through MECHATROLINK communication with the host controller.	SI- EN3
PROFIBUS- DP communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI- P3
Analog monitor	Outputs analog signal for monitoring drive output state (output freq., output current etc.) <ul style="list-style-type: none"> • Output resolution: 11 bit signed (1/2048) • Output voltage: -10 to +10 Vdc (non- isolated) • Output channels: 2 channels 	AO- A3
Digital output	Outputs isolated type digital signal for monitoring drive run state (alarm signal, zero speed detection, etc.). Output channel: Photo coupler 6 channels (48 V, 50 mA or less) Relay contact output 2 channels 250 Vac, 1 A or less 30 Vdc, 1 A or less	DO- A3
Open collector PG interface	For control modes requiring a PG encoder for motor feedback. <ul style="list-style-type: none"> • Phase A, B, and Z pulse (3- phase) inputs (complementary type) • PG frequency range: Approx. 50 kHz max. • Power supply output for PG: +24 V, max. current 30 mA • Pulse monitor output: Open collector, +24 V, max. current 30 mA • Power supply output for PG: +12 V, max. current 200 mA 	PG- B3
Line Driver PG interface	For control modes requiring a PG encoder for motor feedback. <ul style="list-style-type: none"> • Phase A, B, and Z pulse (differential pulse) inputs (RS-422) • PG frequency range: up to 300 kHz (approx.) • Pulse monitor output: RS-422 • Power supply output for PG: +5 V or +12 V, max. current 200 mA 	PG- X3
LED Operator	Easy long distance reading	JVOP-182
Braking Resistor	Used to shorten the deceleration time by dissipating regenerative energy through a resistor. (3% ED) (all models up to 3,7 kW)	ERF-150WJ series
Braking Chopper Unit	Shortened deceleration time results when used with a Braking Resistor Unit.	CDBR series
24 V Power Supply	Provides power supply for the control circuit and option boards. Note: Parameter settings cannot be changed when the drive is operating solely from this power supply.	PS- A10H PS- A10L
USB Copy Unit (RJ-45/ USB compatible plug)	• Adapter for connecting the drive to the USB port of a PC • Can copy parameter settings easily and quickly to be later transferred to another drive.	JVOP-181
LCD operator extension cable	Cable for connecting the LCD operator.	WV001: 1 m WV003: 3 m

Note: contact the manufacturer in question for availability and specifications of non- YASKAWA products.

A1000 Series Ratings & Type Descriptions



200 V				
	Normal duty ^{*1}		Heavy duty	
	Rated output current [A]	Max.applicable motor ^{*2} [KW]	Rated output current [A]	Max.applicable motor ^{*2} [KW]
0004	3,5	0,75	3,2 ^{*3}	0,4
0006	6	1,1	5 ^{*3}	0,75
0010	9,6	2,2	8 ^{*3}	1,5
0012	12	3	11 ^{*3}	2,2
0021	21	5,5	17,5 ^{*3}	4
0030	30	7,5	25 ^{*3}	5,5
0040	40	11	33 ^{*3}	7,5
0056	56	15	47 ^{*3}	11
0069	69	18,5	60 ^{*3}	15
0081	81	22	75 ^{*3}	18,5
0110	110	30	85 ^{*3}	22
0138	138	37	115 ^{*3}	30
0169	169	45	145 ^{*4}	37
0211	211	55	180 ^{*4}	45
0250	250	75	215 ^{*4}	55
0312	312	90	283 ^{*4}	75
0360	360	110	346 ^{*4}	90
0415	415	110	415 ^{*1}	110

400 V				
	Normal duty ^{*1}		Heavy duty	
	Rated output current [A]	Max.applicable motor ^{*2} [KW]	Rated output current [A]	Max.applicable motor ^{*2} [KW]
0002	2,1	0,75	1,8 ^{*3}	0,4
0004	4,1	1,5	3,4 ^{*3}	0,75
0005	5,4	2,2	4,8 ^{*3}	1,5
0007	6,9	3	5,5 ^{*3}	2,2
0009	8,8	4	7,2 ^{*3}	3
0011	11,1	5,5	9,2 ^{*3}	4
0018	17,5	7,5	14,8 ^{*3}	5,5
0023	23	11	18 ^{*3}	7,5
0031	31	15	24 ^{*3}	11
0038	38	18,5	31 ^{*3}	15
0044	44	22	39 ^{*3}	18,5
0058	58	30	45 ^{*3}	22
0072	72	37	60 ^{*3}	30
0088	88	45	75 ^{*3}	37
0103	103	55	91 ^{*3}	45
0139	139	75	112 ^{*4}	55
0165	165	90	150 ^{*4}	75
0208	208	110	180 ^{*4}	90
0250	250	132	216 ^{*4}	110
0296	296	160	260 ^{*4}	132
0362	362	185	304 ^{*4}	160
0414	414	220	370 ^{*4}	185
0515	515	250	450 ^{*4}	220
0675	675	355	605 ^{*4}	315

*1: This value assumes a carrier frequency of 2 kHz. Increasing the carrier frequency requires a reduction in current.
 *2: The motor capacity (kW) refers to a Yaskawa 4- pole, 60 Hz, 200 V motor or 400 V motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.
 *3: This value assumes a maximum carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.
 *4: This value assumes a maximum carrier frequency of 5 kHz. Increasing the carrier frequency requires a reduction in current.

Water Cooled Inverters



- V/ F Control
- Flux/ Vector Control
- Encoder/ Encoderless switchable
- Speed or Torque Control
- Regenerate (Active Front)
- Serial link/ Modbus RTU
- Fieldbus: 2*CANopen/ Device Net, Ethernet/ Modbus TCP, Profibus DP
- Remote I/ O via CANopen
- Logistics, timers, comparators

Module Width mm	Rectifier	Power and Voltage Range	
800	6/12pulse	400V	
	6/12pulse		690V
1200	6/12pulse	400V	
	6/12pulse		690V
1800	12/24pulse	400V	
	12/24pulse		690V
2400	12/24pulse		690V
	12/24pulse		690V
1400*	6/12pulse	400V	
	6/12pulse		690V
1800*	6/12pulse	400V	
	6/12pulse		690V

115kW	200kW	250kW	300kW	350kW	400kW	450kW	500kW	550kW	600kW	650kW	700kW	750kW	800kW	850kW	900kW	950kW	1000kW	1100kW	1200kW	1300kW	1400kW	1500kW	1600kW	1700kW	1800kW	1900kW	2000kW	2200kW	2400kW	2600kW	2800kW	3000kW	3200kW	3400kW	3600kW	3800kW	4000kW	4200kW	4400kW	4600kW	4800kW	5000kW	5500kW	6000kW	6500kW	7000kW	7500kW	8000kW	8500kW	9000kW	9500kW	10000kW
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Available in a wide range of power, Rating table is indicative and depends on parameters like temperature/ speed/ torque etc. Flexibility in design meets your special demands. The housing is either IP23 or IP54 depending on size and application and ensures trouble free operation in harsh environments.

Typical applications: Propulsion/ Azimuth thrusters/ tunnel thrusters, dredge/ cargo pumps, compressors and winches. For industry applications suitable when cooling by air is difficult and limited space. Characterised by high reliability, high efficient, small dimensions, low noise and evacuate heat directly to water and do not contribute to ambient heating in narrow rooms.

Our speciality is retrofit and conversions.

Water Cooled Inverters for Special Applications

For energy saving and optimal operations. Project and service engineers supply, tailor made solutions, making your machinery running at an optimal level.



- High capacity Frequency Inverters
- Water cooled Frequency Inverters up to 5.600 kW
- Diesel electric propulsion
- Winch package drives with motor gear and Frequency Inverter
- Thruster drives
- Compressors and pumps
- Module based on 800kW/1000kW elements

Specifications Special Purpose Inverter Series



Product		Varispeed AC Matrix	G5HP	FSDrive MV1S	FSDrive MX1S
Max. Motor Output (kW)		3~200 VAC, 5.5-45 3~400 VAC, 5.5-75	- 3~400 VAC, 400-1,100	- 3~3300 VAC, 132-2,500 3~6600 VAC, 250-5,000	- 3~3300 VAC, 132-2,500 3~6600 VAC, 250-5,000
Applicable Motor	Induction Motor (IM)	S	S	S	S
	Synchronous Motor (PM)	-	-	-	-
Control	V- f Control	S	S	S	S
	Open Loop Vector (OLV)	S	S	S	S
	Closed Loop Vector (CLV)	S	S	O	O
	OpenLoopVector(OLV)forPM	-	-	-	-
	Adv. Open Loop Vector (OLV) for PM	-	-	-	-
	Closed Loop Vector (CLV) for PM	-	-	-	-
Braking	Dynamic Braking	-	O	-	-
	Regeneration Braking Operation	S	-	-	S
Speed control range	V- f and V- F with PG	1:40	1:20	-	-
	OLV	1:20	1:100	1:100	1:100
	CLV	1:1000	1:1000	1:1000	1:1000
	CLV and OLV for PM	-	-	-	-
Torque Control		-	S	-	-
Max. Output Frequency	400 Hz	120 Hz	150 Hz	120 Hz	120 Hz
	1,000 Hz	-	-	-	-
Fieldbus Interfaces	RS-232C	S	S	S	S
	RS-422-485 (Memobus- Modbus)	S	S	S	S
	MeCHATROInk- I	-	-	-	-
	MeCHATROInk- II	-	-	-	-
	Ethernet- IP	-	-	-	-
	EtherCAT	-	-	-	-
	CC- Link	O	-	-	-
	DeviceNet	O	O	O	O
	PROFIBUS- DP	O	O	-	-
	LONWORKS	-	-	-	-
CANopen	O	O	-	-	
Standards	CE	S	S	on request	on request
	UL- cUL	S	-	-	-
	ROHS	-	-	-	-
	UL508C	-	-	-	-
	En954-1 safe cat. 3, stop cat. 0	-	-	-	-
	EN ISO 13849-1PLd	-	-	-	-
IEC- EN61508 SIL2	-	-	-	-	
Enclosure		IP00	IP20	Vertical self- stand type	Vertical self- stand type
Functions	Speed- Torque Control Switching	S	S	-	-
	Energy Saving Function	S	S	S	S
	Double Rating (ND- HD)	S	S	-	-
	Speed Search	S	-	S	S
	Slip Compensation	S	S	S	S
	Torque Compensation	S	S	S	S
	PID Control (with sleep function)	S	No sleep function	O	O
	DriveWorks EZ (PLC- SPS SW)	S	-	PLC built in	PLC built in
	Momentary Power Loss Ride- Thru	S	S	S	S
	Application Parameter Presets	-	-	O	O
	Preventive Maintenance Functions	-	-	S	S
	RS-232C Interface	S	S	S	S
	USB Interface	-	-	-	-
	Coated PCB	-	-	-	-
Battery Rescue Operation	-	-	-	-	

*1 - Varies according to motor slip *2 - Under development *3 - Only Open Loop Vector Control S - Standard O - Optional

Specifications Special Application Inverter Series



Product		L1000A	L1000V	T1000A	T1000V	E7
Max. Motor Output (kW)		- 3~200 VAC, 4.0-45 3~400 VAC, 4.0-75	- 3~200 VAC, 5.5-15 3~400 VAC, 4.0-15	- 3~200 VAC, 0.4-55 3~400 VAC, 0.4-90	1~230 VAC, 0.1-4.0 3~200 VAC, 0.1-18.5 3~400 VAC, 0.2-18.5	- 3~200 VAC, 0.55-110 3~400 VAC, 0.55-300
Applicable Motor	Induction Motor (IM)	S	S	S	S	S
	Synchronous Motor (PM)	S	-	S	S	-
Control	V- f Control	S	S	S	S	S
	Open Loop Vector (OLV)	S	S	S	S	-
	Closed Loop Vector (CLV)	S	-	S	-	-
	OpenLoopVector(OLV)forPM	-	-	S	S	-
	Adv. Open Loop Vector (OLV) for PM	-	-	S	-	-
	Closed Loop Vector (CLV) for PM	S	-	S	-	-
	Dynamic Braking	S	S	S	S	-
Braking	Regeneration Braking Operation	S	-	-	-	-
	Speed control range	V- f and V- F with PG	1:40	1:40	1:40	1:40
	OLV	1:200	1:100	1:200	1:100	-
	CLV	1:1500	-	1:1500	-	-
	CLV and OLV for PM	1:1500	-	1:1500	1:10	-
Torque Control		-	-	S	-	-
Max. Output Frequency 400 Hz	400 Hz	120 Hz	120 Hz	S	S	200 Hz
	1,000 Hz	-	-	-	-	-
Fieldbus Interfaces	RS-232C	S	S	S	S	S
	RS-422-485 (Memobus- Modbus)	S	-	S	S	S
	MeCHATROLInk- I	-	-	O	O	-
	MeCHATROLInk- II	-	-	O	O	-
	Ethernet- IP	-	-	-	-	-
	EtherCAT	-	-	-	-	-
	CC- Link	-	-	O	O	O
	DeviceNet	-	-	O	O	O
	PROFIBUS- DP	-	-	O	O	O
	LONWORKS	-	-	-	-	O
	CANopen	O	-	O	O	O
Standards	CE	S	S	S	S	S
	UL- cUL	S	S	S	S	S
	ROHS	S	S	S	S	-
	UL508C	S	S	S	S	-
	En954-1 safe cat. 3, stop cat. 0	S	S	S	S	-
	EN ISO 13849-1PLd	S	S	S	S	-
	IEC- EN61508 SIL2	S	S	S	S	-
Enclosure	IP20, NEMA1	IP20, NEMA1	IP20, NEMA1 Finless Types	IP20, NEMA1 Finless Types	IP, IP20, NEMA1, IP54	
Functions	Speed- Torque Control Switching	-	-	-	-	-
	Energy Saving Function	-	-	S	S	S
	Double Rating (ND- HD)	-	-	S	S	-
	Speed Search	-	-	S	S	S
	Slip Compensation	S	S	S	S	-
	Torque Compensation	S	S	S	S	S
	PID Control (with sleep function)	-	-	S	S	S
	DriveWorks EZ (PLC- SPS SW)	-	-	-	-	-
	Momentary Power Loss Ride- Thru	-	-	S	S	S
	Application Parameter Presets	-	-	-	-	-
	Preventive Maintenance Functions	S	S	S	S	-
	RS-232C Interface	S	S	S	S	S
	USB Interface	S	-	-	-	-
	Coated PCB	-	-	S	S	-
	Battery Rescue Operation	S	S	-	-	-

*1 - Varies according to motor slip

*2 - Under development

*3 - Only Open Loop Vector Control

S - Standard

O - Optional

Specifications 1000 Series



Specifications

Product		J1000	V1000	A1000
Max. Motor Output (kW)		1~230 VAC, 0.1-2.2 3~200 VAC, 0.1-5.5 3~400 VAC, 0.2-5.5	1~230 VAC, 0.1-4.0 3~200 VAC, 0.1-18.5 3~400 VAC, 0.2-18.5	- 3~200 VAC, 0.4-110 3~400 VAC, 0.4-30*2
Applicable Motor	Induction Motor (IM)	S	S	S
	Synchronous Motor (PM)	-	S	S
Control	V- f Control	S	S	S
	Open Loop Vector (OLV)	-	S	S
	Closed Loop Vector (CLV)	-	-	S
	OpenLoopVector(OLV)forPM	-	S	S
	Adv. Open Loop Vector (OLV) for PM	S	-	S
	Closed Loop Vector (CLV) for PM	-	-	S
Braking	Dynamic Braking	S	S	S
	Regeneration Braking Operation	-	-	-
Speed control range	V- f and V- F with PG	1:40	1:40	1:40
	OLV	-	1:1000	1:200
	CLV	-	-	1:1500
	CLV and OLV for PM	-	1:10 *3	1:1500
Torque Control		-	-	S
Max. Output Frequency	400 Hz	S	S	S
	1,000 Hz	-	O	O*2
Fieldbus Interfaces	RS-232C	O	S	S
	RS-422-485 (Memobus- Modbus)	O	S	S
	MeCHATROLINK- I	-	O	O
	MeCHATROLINK- II	-	O	O
	Ethernet- IP	-	O*2	O*2
	EtherCAT	-	O*2	O*2
	CC- Link	-	O	O
	DeviceNet	-	O	O
	PROFIBUS- DP	-	O	O
	LONWORKS	-	-	-
	CANopen	-	O	O
Standards	CE	S	S	S
	UL- cUL	S	S	S
	ROHS	S	S	S
	UL508C	S	S	S
	En954-1 safe cat. 3, stop cat. 0	-	S	S
	EN ISO 13849-1 PLd	-	S	S
	IEC- EN61508 SIL2	-	S	S
Enclosure	Enclosure 2	IP20 Finless Types	IP20, NEMA1, IP66 Finless Types	IP00, IP20, NEMA1
Functions	Speed- Torque Control Switching	-	-	S
	Energy Saving Function	S	S	S
	Double Rating (ND- HD)	S	S	S
	Speed Search	S	S	S
	Slip Compensation	S	S	S
	Torque Compensation	-	S	S
	PID Control (with sleep function)	-	S	S
	DriveWorks EZ (PLC- SPS SW)	-	S	S
	Momentary Power Loss Ride- Thru	S	S	S
	Application Parameter Presets	S	S	S
	Preventive Maintenance Functions	-	S	S
	RS-232C Interface	O	S	S
	USB Interface	-	-	S
	Coated PCB	-	-	-
Battery Rescue Operation	-	-	-	

*1 - Varies according to motor slip

*2 - Under development

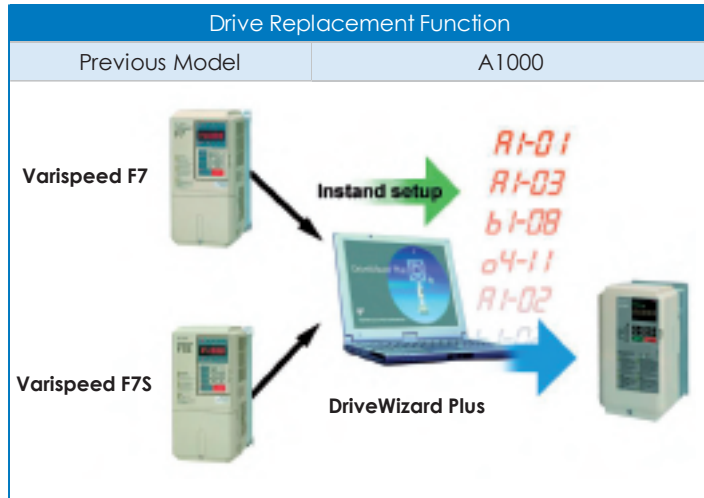
*3 - Only Open Loop Vector Control

S - Standard

O - Optional

Inverter Software Tools

Engineering Tool DriveWizard Plus



- Engineering Tool Drive Wizard Plus
- 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
- The Drive Replacement feature in DriveWizard Plus saves valuable time during equipment replacement and application upgrades by converting previous YASKAWA product parameter values to the new parameters automatically

Note: To obtain a copy of DriveWizard Plus, contact a YASKAWA representative.

“DriveWorksEZ” a simple design environment for easy installation and reliable operation

Application- specific Functional Add- on

Using DriveWorksEZ, machine builders and users are able to configure default application- specific functions, and to adapt customized functionalities for YASKAWA Inverter Series. Control tasks are executed directly in the inverter, eliminating an entire PLC module. Fieldbus overhead is reduced and the drive will react to application requirements with shorter cycle times.

Software Features

The software offers simple operation, a block diagram with 204 function modules, a cycle time (scan time) of 1 ms (for A1000 e.g.), and application examples such as cascade control, positioning tasks etc.

Rapid Project Implementation

Thanks to user- friendly “drag- and- drop” functionalities, PLC functions can be quickly programmed, and may be activated directly in the frequency inverter. Project implementation is fast and easy; the load on central machine control resources is relieved and fieldbus saturation is reduced.

Protection of Intellectual Property

Software that was created using “DriveWorksEZ” is protected against readout and copying by third parties. All rights remain with the software originator so that the author’s intellectual property is protected.



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24- h. service +47 924 32 085

Price Policy

Prices occur in special lists on requirement in specified currency, ex warehouse exclusive packaging. The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Terms of Sales and Delivery

Terms of Sales and delivery are specified on our web site;
www.lonne.com

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Electric and electronic products, so- called EE products may contain toxins which can damage our health and the environment. Therefore, all importers and producers of EE products are obliged to take responsibility for their products until they have been scrapped and recycled. You may return any cast- off Lønne products to a Lønne Warehouse. Lønne is obliged to fulfil the authorities' requirements regarding an environmentally sound handling of EE-waste in accordance with the EE regulations.

General

Export and Import Regulations regarding Lønne Product Range of Drives and Controls will be subject to the Export Import Regulations actual in the area of delivery. We hereby reserve the right to change the content of data in this catalogue at any time without notice. Furthermore, our company shall not be held responsible for neither possible discrepancies in catalogue content nor any damage caused by wrong use of products or information.

Lönne Main Catalogue Chapters:

- Chapter 1 Electric Motors
- Chapter 2 Generators
- Chapter 3 ECOiPM PM Motors
- Chapter 4 Frequency Inverters
- Chapter 5 Servo Controls
- Chapter 6 Machine Controls
- Chapter 7 Worm Gear Boxes
- Chapter 8 Helical Gear Boxes
- Chapter 9 Torque Arm Speed Reducers
- Chapter 10 Planetary Gear Boxes
- Chapter 11 V-belt and V-belt Pulleys
- Chapter 12 Timing Belt and Timing Belt Pulleys
- Chapter 13 Chains and Sprockets
- Chapter 14 Couplings
- Chapter 15 Clamping Elements
- Chapter 16 Disk Brakes
- Chapter 17 Bearings
- Chapter 18 Vibrators



Lönne

Lönne Scandinavia AS was founded in 1949 in Bergen, Norway. Present board member Mr Terje Lönne entered as second generation, and started the expansion into the Nordic market.

Lönne has specialized within electric motors, generators, frequency inverters, gearboxes, transmissions and bearings. Lönne reference list covers a wide range of customers within on shore, off shore, maritime and marine industries.

Step by step the company has grown to become a leading, Nordic supplier within drive technology. Lönne one stop shop concept is a strong force for customers whom operate the total value chain of drive technology components. Lönne is today widely recognized both as a supplier of high quality components and engineered solutions.

Lönne head quarter is located in Bergen, Norway, with subsidiaries in Denmark, Finland and Sweden. The central warehouse, workshop and testing department in Helsingborg provides quick delivery service overnight, to the Nordic market. Smaller express warehouses and workshops are also located in Bergen and Helsinki. See map on the back page for the total Lönne Group.

Lönne Service is a separate part of the Lönne Group. With a total of six workshops in Norway, Lönne Service is specializing in services and repairing of electric motors and generators, both towards on shore and off shore markets. Lönne Service is ranked to have one of the market's largest and most updated machine parks, operated by highly skilled personnel.

Lönne people take pride in every job done, with a high level of professionalism, and really care to **"keep your machinery running!"**

Lönne Quality Management System Standards is certified for ISO 9001:2008.

For further information, please have a look at our website or feel free to call us!

Keeps your machinery running!



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