



YASKAWA

YASKAWA AC DRIVES



Yaskawa AC Drives
The Global Leader in Quality and Reliability

Certified for
ISO9001 and
ISO14001



JQA-0422 JQA-EM0498

Always One Step Ahead

Global Standard: Yaskawa AC Drives

With world-leading quality and technology, Yaskawa delivers AC Drives that help preserve the environment, support comfortable lifestyles, and improve the efficiency and productivity of industrial machines all over the world.

F E A T U R E S



Environmentally Friendly Drives

Yaskawa offers an energy efficient drive that maximizes motor performance. We also provide a variety of environmentally friendly drives, including models fully compliant with the EU's RoHS directive. We can help you to build eco-friendly systems with our strong lineup of general-purpose and application-specific AC Drives.



Safe and Reliable Drives

Yaskawa continues to improve AC Drive technology to minimize unpleasant electromagnetic noise, the effects of harmonic currents and noise on the power-supply line, as well as motor stress and current leakage that could result in degraded insulation or bearing corrosion. Yaskawa offers safe, reliable, and high-quality AC Drives compliant with global safety standards and loaded with a wide variety of safety features.



Easy-to-Use Drives

Yaskawa's technology is a product of our extensive knowledge and years of experience in various fields, giving us the flexibility to respond to all your application needs.

As part of Yaskawa's endless pursuit to make AC Drives more user-friendly, Yaskawa's AC Drives go beyond advanced performance and function. In addition to high-torque, ripple-less operation at low speeds and high-precision, high-speed response, Yaskawa AC Drives are also capable of restarting a coasting motor even in reverse, useful for restarting operation after momentary power loss. Our new product line is easier than ever to maintain, as well as impressively small and lightweight. With so many features focused on the user, Yaskawa AC Drives can be easily adopted to a wide range of applications.



Global Standard Drives

Yaskawa's AC Drives provide support for a variety of field network systems all over the world. This feature enables flexible system construction, expansion, efficient wiring, and connection to a host PLC. Yaskawa's AC Drives comply with UL, cUL, CE, and other international standards. Multi-language support is also available.



- Fans and pumps
- Construction and engineering machinery
- Machinery for paper processing and printing press
- Metallic processing machines and machine tools
- Textile machinery



Yaskawa AC Drives: The Global Leader in Quality and Reliability
Working Together for a Greener Environment

- Packing machinery
- Food processing machinery
- Handling machines
- Chemical processing machinery
- Machinery for the lumber industry



- Health, medical, and welfare-related devices
- Amusement rides, devices, and facilities
- Environment and lifestyle-related devices
- IT-related devices



Both General-Purpose and Application Specific Drives as well as System Solutions

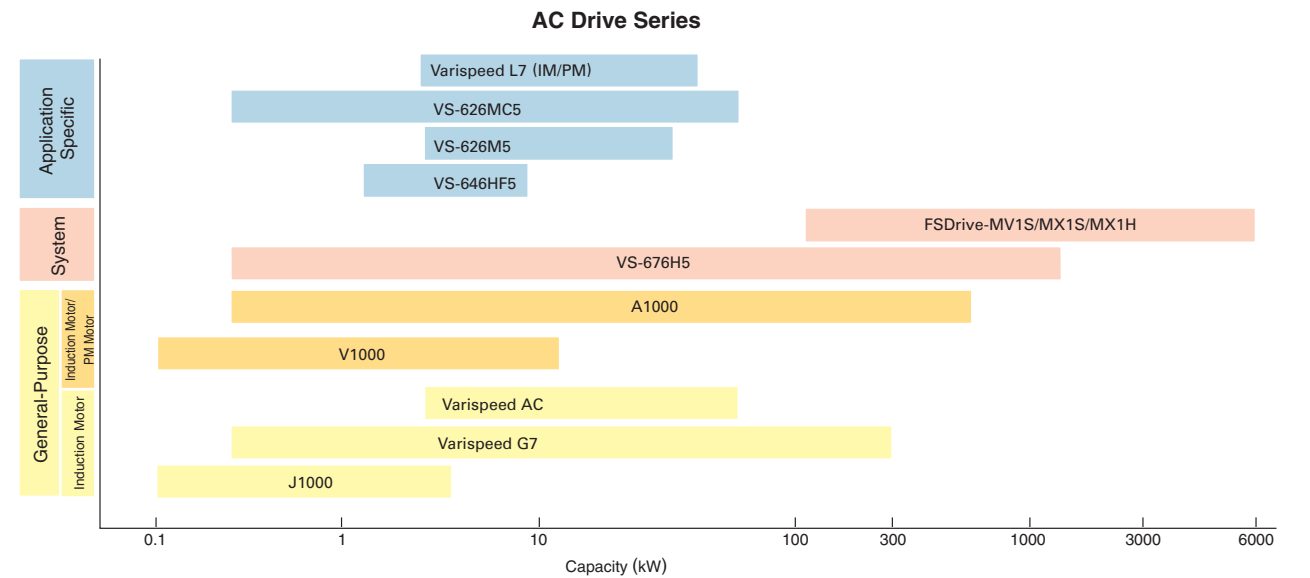
Yaskawa Drives

Today's industrial needs for automated, labor saving, higher speed, and energy-efficient systems are greater than ever. This change has led to a diversification in demand for variable speed drives, resulting in rapid expansion in AC Drive applications because of their high reliability and maintainability.

Yaskawa's AC Drives, with a rich line-up to handle any demand from general-purpose to specialized applications, are ideal for FA and FMS.

Features

- **Optimum drives**
A wide range of products are available for each application: from general to specialized use, and from small to large capacity.
- **More compact than ever**
The most advanced design techniques in combination with large-scale integrated circuit technology allow for an impressively compact drive.
- **Excellent reliability and maintainability**
Product reliability has been improved across the board, with special emphasis placed on high-speed, high-performance trace-back functions for simplified maintenance and inspection.
- **High-precision**
The most advanced digital technology and high-performance vector operation provide total control and high-speed response for DC motors.



AC Drive	Features	Model	Max. Motor Output (kW)				Control		Braking		Speed Control		Torque Control	Rated/Max. Freq. or Rated/Max. Speed	Global Safety Standards	Protective Design	Product Overview	
			0.1	1	10	100	1000	10000	V/f	Vector	Resistance	Regeneration						Range
General-Purpose	Compact V/f control	J1000 (V/f)	0.1	2.2	Single-phase 200 V		●				1:20 to 1:40	±2 to 3*1	-	60/400 Hz	CE, UL/cUL	Open-chassis type Models without heatsink	Catalog No. KAEP C710606 24 <ul style="list-style-type: none"> Compact design, easy operation Overexcitation braking enables emergency braking without the use of a braking resistor. Braking transistor standard in all models Side-by-side installation and DIN rail mounting. Hassle-free maintenance All models are fully compliant with the EU's RoHS directive. 	
		Compact vector control	V1000 (V/f)	0.1	3.7	Single-phase 200 V		●	●			1:20 to 1:40	±2 to 3*1	-	60/400 Hz When using SMRA Series motor 1800 r/min 3600 r/min When using SSRI Series motor 1750 r/min 1450 r/min 1150 r/min	CE, UL/cUL, EN954-1 Cat.3, IEC/EN61508 SIL2	Open-chassis and enclosed (NEMA Type1) Models without heatsink	Catalog No. KAEP C710606 08 <ul style="list-style-type: none"> Compact, high-performance (Open Loop Vector Control) Drives both interior permanent magnet motors (IPMM) and synchronous permanent magnet motors (SPMM) with Yaskawa's new motor-control technology. High starting torque of 200% at 0.5 Hz (using a 3.7 kW drive set for Heavy Duty with a Yaskawa induction motor). Torque limits also possible. Set main parameters automatically with Application Presets. Detachable terminal block with memory for easy maintenance. All models are fully compliant with the EU's RoHS directive.
			V1000 (Open Loop Vector)	0.1	18.5	Three-phase 200 V		●	●			1:100	±0.2	-				
	V1000 (Open Loop Vector for PM)	0.2	18.5	Three-phase 400 V		●	●			1:10 (variable torque)	±0.2	-						
	High performance vector control	A1000 (V/f)					●		●		1:40	±2 to 3*1	-	60/400 Hz	CE, UL/cUL, EN954-1 Cat.3, IEC/EN61508 SIL2	Open-chassis (IP00) and enclosed (NEMA Type1)	Catalog No. KAEP C710616 22 <ul style="list-style-type: none"> Capable of driving any kind of motor. A1000 runs not only induction motors, but also synchronous motors like IPM and SPM motors with high performance vector control. Amazing energy savings and an even more compact setup with a synchronous motor. Powerful torque at 0 Hz. Loaded with Auto-Tuning features. Easily adjust settings for connected machinery. Breeze-easy setup by simply selecting the appropriate application. Use DriveWorksEZ to customize your drive, included with all models. All models are fully compliant with the EU's RoHS directive. 	
		A1000 (V/f with PG)	0.4	110	Three-phase 200 V		●	●			1:40	±0.03	-					
		A1000 (Open Loop Vector)					●	●			1:200	±0.2	-					
		A1000 (Closed Loop Vector)	0.4	630*2	Three-phase 400 V		●	●			1:1500	±0.02	Yes					
		A1000 (Advanced Open Loop Vector for PM)					●	●			1:20 1:100*3	±0.2	-					
	A1000 (Closed Loop Vector for PM)					●	●			1:1500	±0.02	Yes						

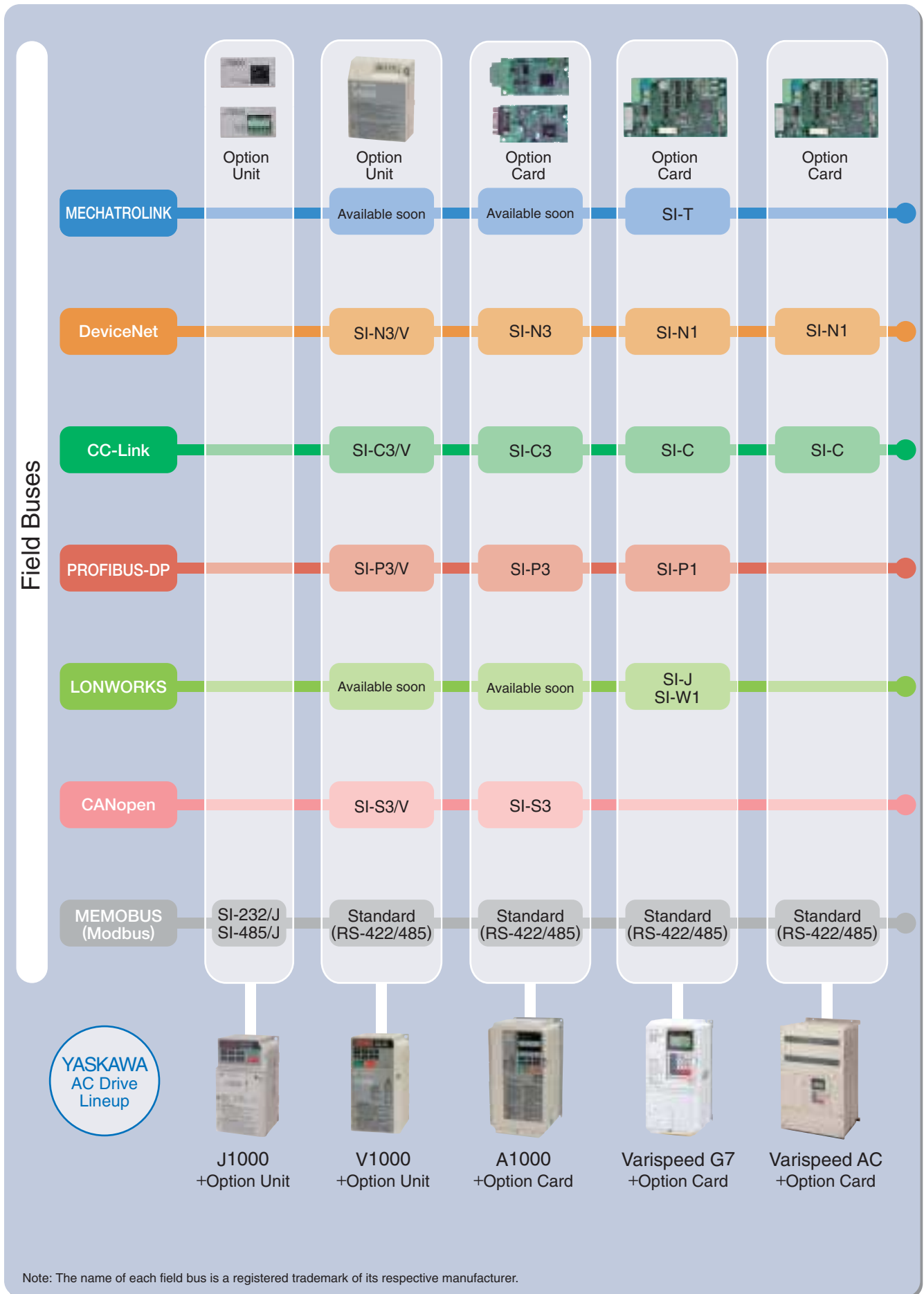
*1: Varies according to motor slip *2: Some models not yet available. *3: When using an IPM motor

AC Drive	Features	Model	Max. Motor Output (kW)						Control		Braking		Speed Control		Torque Control	Rated/Max. Freq. or Rated/Max. Speed	Global Safety Standards	Protective Design	Product Overview
			0.1	1	10	100	1000	10000	V/f	Vector	Resistance	Regeneration	Range	Accuracy (%)					
General-Purpose	High-function fully vector control	Varispeed G7 (V/f)	0.4 110 Three-phase 200 V						●	●			1:20 to 1:40	± 2 to 3^{*1} ($\pm 1^{*2}$) ($\pm 0.03^{*3}$)	–	60/400 Hz	CE, UL/cUL	Open-chassis and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> The "3-level control method" solves micro surge problem for 400 V class drives. Open Loop Vector: over 150% torque at 0.3 Hz. Flux Loop Vector: 150% at 0 Hz. Removable control circuit terminals and cooling fan Various application software (cranes, hoist, energy-saving control, and more) Auto-Tuning function
		Varispeed G7 (Open Loop Vector)	0.4 300 Three-phase 400 V						●	●			1:200	± 0.2	–	60/400 Hz Vector motors: 1750/2100 r/min 1450/1740 r/min 1150/1380 r/min			
		Varispeed G7 (Flux Loop Vector)							●	●			1:1000	± 0.02	Yes				
	Environmentally friendly motor drives	Varispeed AC (V/f)	5.5 45 Three-phase 200 V						●		●		1:10	± 2 to 3^{*1} ($\pm 1^{*2}$)	–	60/120 Hz	CE, UL/cUL	Open-chassis and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> World's first matrix converter, directly converting input AC power into AC output. Features new regenerative capabilities. High efficiency with a simple design and incredibly low harmonic distortion.
		Varispeed AC (Open Loop Vector)	5.5 75 ^{*4} Three-phase 400 V						●		●		1:10	± 0.2	–				
		Varispeed AC (Flux Loop Vector)							●		●		1:1000	± 0.05	Yes				
Application Specific	High-function current vector control	Varispeed L7 (Flux Loop Vector)	3.7 55 Three-phase 200 V 3.7 55 Three-phase 400 V						●	●			1:1000	± 0.01	Yes	60/120 Hz	–	Open-chassis and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> For more energy-efficient elevator applications, capable of controlling both permanent magnet synchronous motors and induction motors. Assures a smooth, quiet, and safe ride.
	Vector-control inverter specialized for machine tools	VS-626M5 (Inverter)	3.7 37 Three-phase 200 V 5.5 45 Three-phase 400 V						●				1:1000	± 0.2	–	1500/8000 r/min 1500/6000 r/min 1500/4500 r/min	CE	Open-chassis and external heatsink	<ul style="list-style-type: none"> Just right for multispindle applications. Handles a variety of machine tooling needs. High precision, high response, and high reliability through vector control.
		VS-656MR5 (Converter with power regeneration)	3.7 37 Three-phase 200 V 3.7 45 Three-phase 400 V								●								
		VS-626MC5 (Available for control without PG)	0.4 75 Three-phase 200 V 0.4 75 Three-phase 400 V						●	●									
High-frequency inverter drives	VS-646HF5	2.2 7.5 Three-phase 200 V						●	●	Optional		1:20	± 0.01 (digital reference) ± 0.3 (analog reference)	–	7 kHz	–	Open-chassis	<ul style="list-style-type: none"> Designed exclusively for YASKAWA spindle motors (2 poles) with an output performance of 300,000 r/min. 	
Other	Power regenerative sine-wave converter	VS-656DC5	20 90 Three-phase 200 V 20 370 ^{*4} Three-phase 400 V								●		–	–	–	–	–	Open-chassis	<ul style="list-style-type: none"> Sine wave PWM converter regenerates power supply. Energy-saving operation when combined with a drive. Minimizes harmonic distortion.
	Power regenerative unit	VS-656RC5	3.7 37 Three-phase 200 V 5.5 75 Three-phase 400 V								●		–	–	–	–	CE, UL/cUL	Open-chassis and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> Power regenerative unit with both braking and regenerative functions. Combine with a motor drive for impressive energy-saving performance.
System	Super energy-saving medium-voltage inverters	FSDrive-MV1S (Open Loop Vector)	200 kVA 3000 kVA Three-phase 3300 V						●				1:100	± 0.5	–	60/120 Hz	–	Free-standing	<ul style="list-style-type: none"> High-efficiency IGBT inverter for energy savings. High power factor (0.95 or more). Near-perfect sine wave input for incredibly low harmonic distortion. Near perfect sine wave output power makes it easy to connect to any motor already operating an application.
		FSDrive-MV1S (Flux Loop Vector)	400 kVA 6000 kVA Three-phase 6600 V						●				1:1000	± 0.02	–				
	Super energy-saving medium-voltage matrix converter	FSDrive-MX1S (Open Loop Vector)	200 kVA 3000 kVA Three-phase 3300 V						●		●		1:100	± 0.5	–	60/120 Hz	–	Free-standing	<ul style="list-style-type: none"> Lightning-quick acceleration or deceleration with power regeneration function. High power factor (0.95 or more). Near-perfect sine wave input for incredibly low harmonic distortion. Near perfect sine wave output power makes it easy to connect to any motor already operating an application.
		FSDrive-MX1S (Flux Loop Vector)	400 kVA 6000 kVA Three-phase 6600 V						●		●		1:1000	± 0.02	–				
	Medium-voltage matrix converter for systems	FSDrive-MX1H (Open Loop Vector)	200 kVA 3000 kVA Three-phase 3300 V						●		●		1:100	± 0.5	–	60/120 Hz	–	Free-standing	<ul style="list-style-type: none"> Lightening-quick acceleration or deceleration with power regeneration function. High speed, quick response. Highly precise, wide-range speed control ($\pm 0.01\%$, 1:1000) Highly precise torque control (Linearity: $\pm 3\%$)
		FSDrive-MX1H (Flux Loop Vector)	400 kVA 6000 kVA Three-phase 6600 V						●		●		1:1000	± 0.01	Yes				

*1: Varies according to motor slip *2: Slip compensation *3: With PG *4: Some models not yet available.

Global Field Networks

Option cards and option units for communications provide support for all major field networks. Easily connect to hosts and PLCs, reduce wiring, and implement centralized management of production equipment.



Note: The name of each field bus is a registered trademark of its respective manufacturer.

Standard Specifications

General-Purpose

Compact V/f Control J1000

200 V Class

Catalog No. KAEP C710606 24

Model	Three-Phase CIMR-JA2A□□□□	0001	0002	0004	0006	0008	0010	0012	0018	0020
	Single-Phase*1 CIMR-JABA□□□□	0001	0002	0003	0006	—	0010	—	—	—
Max. Applicable Motor Capacity*2	Normal Duty	0.2	0.4	0.75	1.1	1.5	2.2	3	3.7	5.5
	Heavy Duty	0.1	0.2	0.4	0.75	1.1	1.5	2.2	3	3.7
Output	Rated Output	0.5	0.7	1.3	2.3	3.0	3.7	4.6	6.7	7.5
	Capacity*3 kVA	Normal Duty*4	0.3*6	0.6*6	1.1*6	1.9*6	2.6*7	3*7	4.2*7	5.3*7
		Heavy Duty	0.3*6	0.6*6	1.1*6	1.9*6	2.6*7	3*7	4.2*7	5.3*7
	Rated Output	Normal Duty*4	1.2	1.9	3.5 (3.3)*5	6	8	9.6	12	17.5
	Heavy Duty	0.8*6	1.6*6	3*6	5*6	6.9*7	8*7	11*7	14*7	17.5*7
	Overload Tolerance	Normal Duty Rating: 120% of rated output current for 60 s, Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads)								
	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 (user-set)								
Power	Rated Voltage/Rated Frequency	Three-phase power supply: three-phase 200 to 240 V 50/60 Hz Single-phase power supply: single-phase 200 to 240 V 50/60 Hz								
	Allowable Voltage Fluctuation	-15 to +10%								
	Allowable Frequency Fluctuation	±5%								

400 V Class

Model	CIMR-JA4A□□□□	0001	0002	0004	0005	0007	0009	0011	
Max. Applicable Motor Capacity*8	Normal Duty	0.4	0.75	1.5	2.2	3	3.7	5.5	
	Heavy Duty	0.2	0.4	0.75	1.5	2.2	3	3.7	
Output	Rated Output	0.9	1.6	3.1	4.1	5.3	6.7	8.5	
	Capacity*9 kVA	Normal Duty*4	0.9	1.4	2.6	3.7	4.2	5.5	7
		Heavy Duty*7	0.9	1.4	2.6	3.7	4.2	5.5	7
	Rated Output	Normal Duty*4	1.2	2.1	4.1	5.4	6.9	8.8	11.1
	Heavy Duty*7	1.2	1.8	3.4	4.8	5.5	7.2	9.2	
	Overload Tolerance	Normal Duty Rating: 120% of rated output current for 60 s, Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads)							
	Max. Output Voltage	Three-phase 380 to 480 V (relative to input voltage)							
	Max. Output Frequency	400 Hz (user-set)							
Power	Rated Voltage/Rated Frequency	Three-phase 380 to 480 V 50/60 Hz							
	Allowable Voltage Fluctuation	-15 to +10%							
	Allowable Frequency Fluctuation	±5%							

Common Specifications

Item	Specifications
Control Method	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 to +50°C) Analog input: within ±0.1% of the max. output frequency (25 ±10°C)
Frequency Setting Resolution	Digital input: 0.01 Hz Analog input: 1/1000 of max. output frequency
Output Frequency Resolution	20 bit resolution at maximum output frequency
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 to 1:40
Accel/Decel Time	0.01 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
Braking Torque	① Instantaneous decel torque*10: over 150% for 0.1/0.2 kW, over 100% for 0.4/ 0.75 kW, over 50% for 1.5 kW, and over 20% for 2.2 kW and above. ② Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option*11: 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, 9-step speed (max), Accel/decel time switch, S-curve accel/decel, 3-wire sequence, 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, Fault restart ...

*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: Rated output capacity is calculated with a rated output voltage of 220 V.

*4: This value assumes a carrier frequency of 2 kHz. Increasing the carrier frequency requires a reduction in current.

*5: Value inside parenthesis is for a single-phase drive.

*6: This value assumes a carrier frequency of 10 kHz. Increasing the carrier frequency requires a reduction in current.

*7: This value assumes a carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.

*8: 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.

*9: Rated output capacity is calculated with a rated output voltage of 440 V.

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

*11: Parameter L3-04 should be disabled when a Braking Resistor or Braking Resistor Unit is connected, the motor may not stop within the specified deceleration time.

General-Purpose

Compact Vector Control V1000

200 V Class

Catalog No. KAEP C710606 08

Model	Three-Phase CIMR-VA2A□□□□	0001	0002	0004	0006	0008	0010	0012	0018	0020	0030	0040	0056	0069	
	Single-Phase*2 CIMR-VABA□□□□	0001	0002	0003	0006	—	0010	0012	—	0018*1	—	—	—	—	
Max. Applicable Motor Capacity*3	Normal Duty	0.2	0.4	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	
	Heavy Duty	0.1	0.2	0.4	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	
Output	Rated Output	Normal Duty*5	0.5	0.7	1.3	2.3	3	3.7	4.6	6.7	7.5	11.4	15.2	21.3	26.3
	Capacity*4	Heavy Duty	0.3*7	0.6*7	1.1*7	1.9*7	2.6*8	3*8	4.2*8	5.3*8	6.7*8	9.5*8	12.6*8	17.9*8	22.9*8
	Rated Output	Normal Duty*5	1.2	1.9	3.5(3.3)*6	6	8	9.6	12	17.5	19.6	30	40	56	69
	Current	Heavy Duty	0.8*7	1.6*7	3*7	5*7	6.9*8	8*8	11*8	14*8	17.5*8	25*8	33*8	47*8	60*8
Overload Tolerance		Normal Duty Rating: 120% of rated output current for 60 s. Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads)													
Max. Output Voltage		3-phase power supply: 3-phase 200 to 240 V (proportional to input voltage) Single-phase power supply: 3-phase 200 to 240 V (proportional to input voltage)													
Max. Output Frequency		400 Hz (user-set)													
Power	Rated Voltage/Rated Frequency	3-phase power supply: 3-phase 200 to 240 V 50/60 Hz						Single-phase power supply: Single-phase 200 to 240 V 50/60 Hz							
	Allowable Voltage Fluctuation	-15 to +10%													
	Allowable Frequency Fluctuation	±5%													

400 V Class

Model	Three-Phase CIMR-VA4A□□□□	0001	0002	0004	0005	0007	0009	0011	0018	0023	0031	0038	
Max. Applicable Motor Capacity*3	Normal Duty	0.4	0.75	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	
	Heavy Duty	0.2	0.4	0.75	1.5	2.2	3	3.7	5.5	7.5	11	15	
Output	Rated Output	Normal Duty*5	0.9	1.6	3.1	4.1	5.3	6.7	8.5	13.3	17.5	23.6	29
	Capacity*9	Heavy Duty*8	0.9	1.4	2.6	3.7	4.2	5.5	7	11.3	13.7	18.3	23.6
	Rated Output	Normal Duty*5	1.2	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23	31	38
	Current	Heavy Duty*8	1.2	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18	24	31
Overload Tolerance		Normal Duty Rating: 120% of rated output current for 60 s. Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads)											
Max. Output Voltage		3-phase 380 to 480 V (proportional to input voltage)											
Max. Output Frequency		400 Hz (user-set)											
Power	Rated Voltage/Rated Frequency	3-phase 380 to 480 V 50/60 Hz											
	Allowable Voltage Fluctuation	-15 to +10%											
	Allowable Frequency Fluctuation	±5%											

Common Specifications

Items	Specifications
Control Method	Open Loop Vector Control (Current Vector), V/f Control, Open Loop Vector Control for PM motors (for SPM and IPM motors)
Frequency Control Range	0.01 to 400 Hz
Frequency Accuracy (Temperature Fluctuation)	Digital Input: within ±0.01% of the max. output frequency (-10 to +50°C) Analog Input: within ±0.1% of the max. output frequency (25 ±10°C)
Output Frequency Resolution	20 bit of maximum output frequency (parameter E1-04 setting)
Frequency Setting Signal	Main frequency reference: 0 to +10 Vdc (20 kΩ), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) Main speed reference: Pulse Train Input max. 32 kHz
Starting Torque	200% / 0.5 Hz (assumes Heavy Duty rating IM of 3.7 kW or less using Open Loop Vector Control), 50% / 6 Hz (assumes Open Loop Vector Control for PM motors)
Speed Control Range	1:100 (Open Loop Vector Control), 1:20 to 40 (V/f Control), 1:10 (Open Loop Vector Control for PM motors)
Speed Control Accuracy	±0.2% in Open Loop Vector Control (25 ±10°C) *10
Speed Response	5 Hz in Open Loop Vector (25 ±10°C) (excludes temperature fluctuation when performing Rotational Auto-Tuning)
Torque Limit	Open Loop Vector Control allows separate settings in four quadrants.
Accel/Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
Braking Torque	① Instantaneous decel torque*11: over 150% for 0.1/0.2 kW, over 100% for 0.4/0.75 kW, over 50% for 1.5 kW, and over 20% for 2.2 kW and above (overexcitation braking/High-Slip Braking: approx. 40%). ② Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option:*12 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/dec time switch, S-curve accel/dec, 3-wire sequence, Auto-Tuning (rotational, stationary tuning for resistance between lines), Dwell, Cooling fan on/off switch, Slip compensation, Torque compensation, Frequency jump, Frequency upper/lower limit settings, DC injection braking at start/stop, Overexcitation braking High slip braking, PID control (with sleep function), Energy saving control, MEMOBUS communication (RS-485/422 max. 115.2 kbps), Fault restart, Application presets, DriveWorksEZ (customization function), Removable terminal block with parameter backup function...
Safety Standard	CE, UL/cUL, EN954-1 Cat. 3, IEC/EN61508 SIL2
Protection Design	IP20 open-chassis, NEMA Type 1 enclosure

- *1: Heavy Duty (3.7 kW) only.
- *2: Drives with a single-phase power supply input have three-phase output. Single-phase motors cannot be used.
- *3: The motor capacity (kW) refers to a Yaskawa 4-pole, 60 Hz motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.
- *4: Value displayed is for when operating at the rated output current. Rated output capacity is calculated with a rated output voltage of 220 V.
- *5: This value assumes a carrier frequency of 2 kHz. Increasing the carrier frequency requires a reduction in current.
- *6: Value inside parenthesis is for a single-phase drive.
- *7: This value assumes a carrier frequency of 10 kHz. Increasing the carrier frequency requires a reduction in current.
- *8: This value assumes a carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.
- *9: Rated output capacity is calculated with a rated output voltage of 440 V.
- *10: Speed control accuracy may vary slightly depending on installation conditions or motor used.
- *11: Momentary average deceleration torque refers to the deceleration torque from 60 Hz down to 0 Hz. This may vary depending on the motor.
- *12: If L3-04 is enabled when using a braking resistor or braking resistor unit, the motor may not stop within the specified deceleration time.

High Performance Vector Control A1000

200 V Class

Catalog No. KAEP C710616 22

Model	CIMR-AA2A	0004	0006	0008	0010	0012	0018	0021	0030	0040	0056	0069	0081	0110	0138	0169	0211	0250	0312	0360	0415	
Max. Applicable Motor Capacity*1	Normal Duty	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	110	
	Heavy Duty	0.4	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	
Output	Rated Output Capacity*2	1.3	2.3	3	3.7	4.6	6.7	8	11.4	15.2	21	26	31	42	53	64	80	95	119	137	158	
	Normal Duty*3	1.3	2.3	3	3.7	4.6	6.7	8	11.4	15.2	21	26	31	42	53	64	80	95	119	137	158	
	Heavy Duty	1.2*4	1.9*4	2.6*4	3*4	4.2*4	5.3*4	6.7*4	9.5*4	12.6*4	17.9*4	23*4	29*4	32*4	44*4	55*4	69*5	82*5	108*5	132*5	158*3	
	Rated Output	3.5	6	8	9.6	12	17.5	21	30	40	56	69	81	110	138	169	211	250	312	360	415	
	Normal Duty*3	3.5	6	8	9.6	12	17.5	21	30	40	56	69	81	110	138	169	211	250	312	360	415	
	Heavy Duty	3.2*4	5*4	6.9*4	8*4	11*4	14*4	17.5*4	25*4	33*4	47*4	60*4	75*4	85*4	115*4	145*4	180*5	215*5	283*5	346*5	415*3	
Overload Tolerance	Normal Duty Rating: 120% of rated output current for 60 s Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads)																					
Max. Output Voltage	Three-phase 200 to 240 V (relative to input voltage)																					
Max. Output Frequency	400 Hz (user-set)																					
Power	Rated Voltage/Rated Frequency	Three-phase 200 to 240 Vac 50/60 Hz 270 to 340 Vdc																				
	Allowable Voltage Fluctuation	-15% to +10%																				
	Allowable Frequency Fluctuation	±5%																				

400 V Class

Model	CIMR-AA4A	0002	0004	0005	0007	0009	0011	0018	0023	0031	0038	0044	0058	0072	0088	0103	0139	0165	0208	0250	0296	0362
Max. Applicable Motor Capacity*1	Normal Duty	0.75	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185
	Heavy Duty	0.4	0.75	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160
Output	Rated Output Capacity*2	1.6	3.1	4.1	5.3	6.7	8.5	13.3	17.5	24	29	34	44	55	67	78	106	126	159	191	226	276
	Normal Duty*3	1.6	3.1	4.1	5.3	6.7	8.5	13.3	17.5	24	29	34	44	55	67	78	106	126	159	191	226	276
	Heavy Duty	1.4*4	2.6*4	3.7*4	4.2*4	5.5*4	7*4	11.3*4	13.7*4	18.3*4	24*4	30*4	34*4	48*4	57*4	69*4	85*4	114*5	137*5	165*5	198*5	232*5
	Rated Output	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23	31	38	44	58	72	88	103	139	165	208	250	296	362
	Normal Duty*3	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23	31	38	44	58	72	88	103	139	165	208	250	296	362
	Heavy Duty	1.8*4	3.4*4	4.8*4	5.5*4	7.2*4	9.2*4	14.8*4	18*4	24*4	31*4	39*4	45*4	60*4	75*4	91*4	112*4	150*5	180*5	216*5	260*5	304*5
Overload Tolerance	Normal Duty Rating: 120% of rated output current for 60 s Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads)																					
Max. Output Voltage	Three-phase 380 to 480 V (relative to input voltage)																					
Max. Output Frequency	400 Hz (user-set)																					
Power	Rated Voltage/Rated Frequency	Three-phase 380 to 480 Vac 50/60 Hz 510 to 680 Vdc																				
	Allowable Voltage Fluctuation	-15% to +10%																				
	Allowable Frequency Fluctuation	±5%																				

Common Specifications

Item	Specifications	
Control Characteristics	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
	Frequency Control Range	0.01 to 400 Hz
	Frequency Accuracy (Temperature Fluctuation)	Digital reference: within ±0.01% of the max. output frequency (-10 to +40°C) Analog reference: within ±0.1% of the max. output frequency (25°C ±10°C)
	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*7 (Open Loop Vector Control), 200%/0 r/min*7 (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 (Open Loop Vector Control with PG 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) *8, 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*9: 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*10: 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, Feed forward control, Zero-servo control, Momentary power loss ride-thru, Speed search, Overtorque detection, Torque limit, 17-step speed (max), Accel/dec time switch, S-curve accel/dec, 3-wire sequence, Auto-tuning (rotational, stationary), Dwell, Online tuning, 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 (customization function), Removable terminal block with parameter backup function...	
Safety Standard	UL508C, EN954-1 Cat. 3, IEC/EN61508 SIL2	
Protection Design	IP00 open-chassis, NEMA Type 1 enclosure	

*1: The motor capacity (kW) refers to a Yaskawa 4-pole, 60 Hz motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.
 *2: Rated output capacity is calculated with a rated output voltage of 220 V.
 *3: This value assumes a carrier frequency of 2 kHz. Increasing the carrier frequency requires a reduction in current.
 *4: This value assumes a carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.
 *5: This value assumes a carrier frequency of 5 kHz. Increasing the carrier frequency requires a reduction in current.
 *6: Rated output capacity is calculated with a rated output voltage of 440 V.
 *7: Requires a drive with recommended capacity.
 *8: Speed control accuracy may vary slightly depending on installation conditions or motor used. Contact Yaskawa for details.
 *9: Momentary average deceleration torque refers to the deceleration torque from 60 Hz down to 0 Hz. This may vary depending on the motor.
 *10: If L3-04 is enabled when using a braking resistor or braking resistor unit, the motor may not stop within the specified deceleration time.

General-Purpose

Advanced Vector Control Inverter Varispeed G7

200 V Class

Catalog No. KAE-S616-60

Model CIMR-G7A□□□□		20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110	
Max. Applicable Motor Capacity*1		kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output	Rated Output Capacity	kVA	1.2	2.3	3	4.6	6.9	10	13	19	25	30	37	50	61	70	85	110	140	160
	Rated Output Current	A	3.2	6	8	12	18	27	34	49	66	80	96	130	160	183	224	300	358	415
	Max. Output Voltage	3-phase, 200/208/220/230/240 V (proportional to input voltage)																		
	Max. Output Frequency	400 Hz by parameter settings*2																		
Power	Rated Voltage/Rated Frequency	3-phase, 200/208/220/230/240 V, 50/60 Hz*3																		
	Allowable Voltage Fluctuation	-15 to +10%																		
	Allowable Frequency Fluctuation	±5%																		
Harmonic Suppression	DC Reactor	Optional										Standard								
12-pulse Input		Not available										Available*4								

400 V Class

Model CIMR-G7A□□□□		40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300	
Max. Applicable Motor Capacity*1		kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output	Rated Output Capacity	kVA	1.4	2.6	3.7	4.7	6.9	11	16	21	26	32	40	50	61	74	98	130	150	180	210	230	280	340	460
	Rated Output Current	A	1.8	3.4	4.8	6.2	9	15	21	27	34	42	52	65	80	97	128	165	195	240	270	302	370	450	605
	Max. Output Voltage	3-phase, 380/400/415/440/460/480 V (proportional to input voltage)																							
	Max. Output Frequency	400 Hz by parameter settings*2																							
Power	Rated Voltage/Rated Frequency	3-phase, 380/400/415/440/460/480 V, 50/60 Hz																							
	Allowable Voltage Fluctuation	-15 to +10%																							
	Allowable Frequency Fluctuation	±5%																							
Harmonic Suppression	DC Reactor	Optional										Standard													
12-pulse Input		Not available										Available*4													

Common Specifications

Items	Specifications
Control Method	Sine wave PWM (Flux Loop Vector Control, Open Loop Vector Control 1 and 2*5, V/f Control, V/f with PG Control)
Starting Torque	150% at 0.3 Hz (Open Loop Vector Control 2)*6, 150% at 0 r/min (Flux Loop Vector Control)*6
Speed Control Range	1 : 200 (Open Loop Vector Control 2)*6, 1 : 1000 (Flux Loop Vector Control)*6
Speed Control Accuracy	±0.2%*8 (Open Loop Vector Control 2 at 25±10°C), ±0.02% (Flux Loop Vector Control at 25±10°C)*6
Speed Response	10 Hz (Open Loop Vector Control 2)*6, 40 Hz (Flux Loop Vector Control)*6
Torque Limit	Vector Control allows separate settings in four quadrants.
Torque Accuracy	±5%
Frequency Control Range	0.01 to 400 Hz*2
Frequency Accuracy (Temperature Fluctuation)	Digital reference: ±0.01%, -10 to +40°C ; Analog reference: ±0.1%, 25±10°C
Frequency Setting Resolution	Digital reference: 0.01 Hz; Analog reference: 0.03/60 Hz (11 bit signed)
Output Frequency Resolution	0.001 Hz
Overload Tolerance	150% of rated output current for 1 min., 200% of rated output current for 0.5 s
Frequency Setting Signal	-10 to +10 V, 0 to 10 V, 4 to 20 mA, pulse train
Accel/Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
Braking Torque	Approx. 20% (approx. 125% with dynamic braking resistor option)*7, 200/400 V 15 kW or less have an internal braking transistor.
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), Dwell, Cooling fan on/off switch, Slip compensation, Torque compensation, Frequency jump, Frequency upper/lower limit settings, DC injection braking at start/stop, High slip braking, PID control (with sleep function), Energy saving control, MEMOBUS communication (RS-485/422 max. 19.2 kbps), Fault restart, Parameter copy, Droop control, Torque control, Speed/torque control switching, Feedforward control, Zero-servo control...

- *1: The motor capacity (kW) refers to a Yaskawa 4-pole motor. The rated output current of the inverter output amps should be equal to or greater than the motor rated current.
Select a motor that does not exceed the maximum output specifications for the drive.
- *2: The setting range for Open Loop Vector Control 2 is 0 to 66 Hz (for PROG: 103□, 0 to 132 Hz).
- *3: The power supply for the cooling fan used in 200 V 30 kW inverters and larger is three-phase 200/208/220 V 50 Hz, and 200/208/220/230 V 60 Hz.
Transformer is required for the cooling fan power supply in 230 V 50 Hz and 240 V 50/60 Hz units.
- *4: A 3-winding transformer (option) is required at 12-pulse input.
- *5: Contact your Yaskawa representatives when using the Open Loop Vector Control 2 for an application with large regenerative power (hoists, etc.).
- *6: Rotational Auto-Tuning must be performed prior to operating in Flux Loop Vector Control and Open Loop Vector Control 2 in order to ensure inverter performance.
- *7: Stall Prevention must be disabled during deceleration (L3-04 = 0) when using any type of braking resistor.
If enabled, the inverter will not be able to stop the motor within the designated time.
- *8: The speed control accuracy depends on the installation conditions and type of motor used. Contact your Yaskawa representative for details.

Environmentally Friendly Motor Drive Matrix Converter **Varispeed AC**

Voltage Class		200 V				400 V				
Model CIMR-ACA□□□□		25P5	2011	2022	2045	45P5	4011	4022	4045	4075*1
Max. Applicable Motor Capacity*2 kW		5.5	11	22	45	5.5	11	22	45	75
Rated Input Current*3 A		26	47	91	174	14	26	49	92	157
Output	Rated Output Capacity kVA	9	17	33	63	10	19	36	67	114
	Rated Output Current*4 A	27	49	96	183	15	27	52	97	165
Max. Output Voltage		95% of input voltage								
Max. Output Frequency		Frequencies supported up to 120 Hz using parameter setting								
Power	Rated Voltage/Rated Frequency	3-phase, 200/208/220 V, 50/60 Hz				3-phase, 380/400/415/440/460/480 V, 50/60 Hz				
	Allowable Voltage Fluctuation	-15 to +10%								
	Allowable Frequency Fluctuation	±3% (Frequency fluctuation rate: 1 Hz/100 ms or less)								
	Allowable Power Voltage Imbalance between Phases	Within 2%								
	Input Power Factor	0.95 or more (When the rated load is applied.)								
	Control Method	Sine wave PWM (Flux Loop Vector Control, Open Loop Vector Control, V/f Control)								
Control Characteristics	Starting Torque	150% / 0 Hz (Flux Loop Vector Control)*5								
	Speed Control Range	1 : 1000 (Flux Loop Vector Control)*5								
	Speed Control Accuracy*6	±0.2% (Open Loop Vector Control: 25 ±10°C)*5, ±0.05% (Flux Loop Vector Control: 25 ±10°C)*5								
	Speed Response	30 Hz (Flux Loop Vector Control)*5								
	Torque Limits	Vector Control allows separate settings in four quadrants.								
	Torque Accuracy	±10% (Flux Loop Vector Control: 25 ±10°C with a vector motor, carrier frequency of 4 kHz)*5								
	Frequency Control Range	0.01 to 120 Hz								
	Frequency Accuracy (Temperature Fluctuation)	Digital reference: ±0.01% (-10 to +40°C), Analog reference: ±0.1% (25 ±10°C)								
	Frequency Setting Resolution	Digital reference: 0.01 Hz, Analog reference: 0.03 / 60 Hz (11bit with no sign)								
	Output Frequency Resolution	0.001 Hz								
	Overload Tolerance*7	150% of rated output current per minute								
	Accel/Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)								
	Braking Torque	Same overload capacity for motoring and regeneration								
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), Dwell, Cooling fan on/off switch, Slip compensation, Torque compensation, Frequency jump, Frequency upper/lower limit settings, DC injection braking at start/stop, PID control (with sleep function), MEMOBUS communication (RS-485/422 max.19.2 kbps), Fault restart, Droop control, Parameter copy, Torque control, Speed/torque control switching...									

*1: Under development.

*2: The motor capacity (kW) refers to a Yaskawa 4-pole motor. The rated output current of the MxC output amps should be equal to or greater than the motor rated current.

*3: The rated current will vary in accordance with the values of the voltage or impedance of the power supply (including the power transformer, the input reactor, and wires).

*4: Carrier frequency and control method setting may require output current derating.

*5: Rotational Auto-Tuning must be performed prior to operating in Open Loop Vector and Flux Loop Vector Control in order to ensure MxC performance.

*6: The speed control accuracy depends on the installation conditions and type of motor used. Contact your Yaskawa representative for details.

*7: Applications with repetitive loads may require derating (reducing carrier frequency and current, which involves increasing the frame size of the MxC). Contact your Yaskawa representative for details.

Inverters For Elevator Drives **Varispeed L7**

200 V Class

Catalog No. KAEP C710676 00

Model CIMR-L7B□□□□		23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	
Output Rating	Nominal Motor Output kW	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	
	Rated Output Current*1 A (3 min., 50%ED)	fc = 8 kHz	17.5	25	33	49	64	80	96	130	160	183	224
		fc = 15 kHz	12	17.5	25	33	49	64	80	96	130	160	183
	Max. Output Voltage	3-phase; 200/208/220/230/240 V (proportional to input voltage)											
Max. Output Frequency	Up to 120 Hz by parameter setting.												
Power	Rated Voltage/Rated Frequency	3-phase; 200/208/220/230/240 V 50/60 Hz*2											
	Rated Input Current A	21	25	40	52	68	96	115	156	176	220	269	
	Allowable Voltage Fluctuation	-15 to +10%											
	Allowable Frequency Fluctuation	±5%											
	Input Reactor	DC Reactor						AC Reactor					
	Braking Transistor	Built-in (30% ED, 30 s)						Optional					

400 V Class

Model CIMR-L7B□□□□		43P7	44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	
Output Rating	Nominal Motor Output kW	3.7	4	5.5	7.5	11	15	18.5	22	30	37	45	55	
	Rated Output Current*1 A (3 min., 50%ED)	fc = 8 kHz	8.5	11	14	18	27	34	41	48	65	80	96	128
		fc = 15 kHz	6.2	8.5	11	14	18	27	34	41	48	65	80	96
	Max. Output Voltage	3-phase; 380/400/415/440/460/480 V (proportional to input voltage)												
Max. Output Frequency	Up to 120 Hz by parameter setting.													
Power	Rated Voltage/Rated Frequency	3-phase; 380/400/415/440/460/480 V 50/60 Hz												
	Rated input current A	10.2	13.2	17	22	32	41	49	58	78	96	115	154	
	Allowable Voltage Fluctuation	-15 to +10%												
	Allowable Frequency Fluctuation	±5%												
	Input Reactor	DC Reactor						AC Reactor						
	Braking Transistor	Built-in (30% ED, 30 s)						Optional						

Common Specifications

Control Method	Sine wave PWM (Flux Loop Vector Control, Open Loop Vector Control 1, V/f Control, PM Flux Loop Vector Control)
Starting Torque	Normal duty: 8 kHz of carrier frequency, 150% overload for 30 s.
Speed Control Range	1:40 (V/f Control)
	1:100 (Open Loop Vector Control 1) 1:1000 (Flux Loop Vector Control, PM Flux Loop Vector Control)
Speed Control Accuracy*3	±3% (V/f Control)
	±0.2% (Open Loop Vector Control 1) ±0.02% (Flux Loop Vector Control, PM Flux Loop Vector Control)
Speed Response	5 Hz (Open Loop Vector Control 1), 40 Hz (Flux Loop Vector Control)
Torque Limit	Vector Control allows separate settings in four quadrants.
Torque Accuracy	±5%
Frequency Control Range	0.01 to 120 Hz
Frequency Accuracy (Temperature Fluctuation)	Digital reference: ±0.01%, -10 to +40°C; Analog reference: ±0.1%, 25 ±10°C
Frequency Setting Resolution	Digital reference: 0.01 Hz; Analog reference: 0.025 /50 Hz (11 bit with no sign)
Output Frequency Resolution	0.01 Hz
Overload Tolerance / Max. Current	Normal duty: 150%*5 of rated output current for 30 s
Frequency Setting Signal	0 to 10 V
Accel/Decel Time	0.01 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
S-curve Setting	Starting, acceleration end, deceleration start, leveling, stop setting independently.
Braking Torque*4	Approx. 20% (125% with dynamic braking resistor option), 200/400 V 18.5 kW or less have an internal braking transistor.
Major Control Functions	Hardware baseblock conforms to EN954-1 safety category 3 and stop category 0.
	Overtorque/undertorque detection, Torque limit, 8-step speed (max), 4 accel/decel time switch, Auto-Tuning (rotational, stationary), Dwell, Cooling fan on/off switch, Slip compensation, Torque compensation, DC injection braking at start/stop, Fault restart, Parameter copy, Special elevator functions and sequences, Brake sequence, Short floor, Hardware baseblock

*1: Factory setting of carrier frequency (fc): 8 kHz for inverters of 30 kW or less ; 5 kHz for inverters of 37 kW or more.

*2: The power supply for the cooling fan used in 200 V 37 kW inverters and larger is three-phase 200/208/220 V 50 Hz, and 200/208/220/230 V 60 Hz.

*3: The speed control accuracy depends on the installation conditions and type of motor used. Contact your Yaskawa representative for details.

*4: Stall Prevention must be disabled during deceleration (L3-04 = 0) when using any type of braking resistor. If enabled, the inverter will not be able to stop the motor within the designated time.

*5: The overload tolerance may drop to 150% or less when running at a low speed of 6 kHz or less.

Note: When starting and stopping the inverter extremely often, the IGBT in the inverter will be subject to heat stress, which may result in a shortened life.

When the carrier frequency is set to its default value and the inverter starting current is set to 130%, the inverter is allowed to start and stop a maximum of approximately three million times. If the inverter needs to be started and stopped more often, replace the inverter with a model that is one frame size larger, so the starting current will be 130% or less. Unless low noise is required, reduce the carrier frequency to 2 kHz.

Application Specific

Vector-controlled Inverter Drives with Power Regenerative Function for Machine Tools **VS-626M5/VS-656MR5**

Catalog No. KAE-S626-7

Motor	Model	UAASKA-□□FZ								UAASKJ-□□FZ		UAASKA-□□FZ*E						UAASKJ-□□FZ*E			
		04	06	08	11	15	19	22	30	37	06	08	11	15	19	22	30	37	45		
Rated Output* ¹ kW	30 minutes (50%ED)	3.7* ⁴	5.5	7.5	11	15	18.5	22	30	37	5.5	7.5	11	15	18.5	22	30	37	45		
	Continuous	2.2	3.7	5.5	7.5	11	15	18.5	22	30	3.7	5.5	7.5	11	15	18.5	22	30	37		
Rated Speed r/min	Base Speed	1500								1150		1500						1150			
	Max. Speed	8000				6000				4500		8000			6000			4500			
Continuous Rating Torque N·m		14	23.5	35	47.7	70	95	117.6	182.3	249	23.5	35	47.7	70	95	117.6	182.3	249	306.8		
Rotor Inertia (GD ² /4) kg·m ²		0.009	0.017	0.026	0.033	0.069	0.083	0.098	0.259	0.34	0.017	0.026	0.033	0.069	0.083	0.098	0.259	0.34	0.473		
Overload Capacity		120% of 30-min rating for 1 min									120% of 30-min rating for 1 min										
Vibration		V5									V10		V5						V10		
Noise Level		75 dB(A) or less									80 dB(A) or less		75 dB(A) or less						80 dB(A) or less		
Controller	Model CIMR-M5□□□□	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	45P5	47P5	4011	4015	4018	4022	4030	4037	4045		
	Control Method	Sine wave PWM inverter (Vector Control)									Sine wave PWM inverter (Vector Control)										
	Speed Control Range	40 r/min to maximum motor speed									40 r/min to maximum motor speed										
	Speed Regulation	0.2% of maximum speed or less									0.2% of maximum speed or less										
	Overload Tolerance	120% of 30-min rating for 1 min									120% of 30-min rating for 1 min										
Converter* ³	Model CIMR-MR5□□□□	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	45P5	47P5	4011	4015	4018	4022	4030	4037	4045		
	Required Power Capacity kVA	7	9	12	19	24	30	36	48	60	9	12	19	24	30	36	48	60	70		
	Power Supply	3-phase, 200 V (50/60 Hz), 220 V (50/60 Hz), 230 V (60 Hz) (allowable voltage fluctuation: -15 to +10%, frequency fluctuation: ±5%, voltage imbalance between lines: 5% or less)									3-phase, 400 V (50/60 Hz), 440 V (50/60 Hz), 460 V (60 Hz) (allowable voltage fluctuation: -15 to +10%, frequency fluctuation: ±5%, voltage imbalance between lines: 5% or less)										
	Control Power Supply	Single-phase, 200 V (50/60 Hz), 220 V (50/60 Hz), 230 V (60 Hz) (allowable voltage fluctuation: -15 to +10%, allowable frequency fluctuation: ±5%)									Single-phase, 200 V (50/60 Hz), 220 V (50/60 Hz), 230 V (60 Hz) (allowable voltage fluctuation: -15 to +10%, allowable frequency fluctuation: ±5%)										
	Control Method	Power Regenerative Control (120° current conduction)									Power Regenerative Control (120° current conduction)										
Overload Capacity	120% for 1 min, 200% for 1 s									120% for 1 min, 200% for 1 s											

*1: Rated output power is guaranteed if input voltage meets the following conditions: three-phase and 200 V 50/60 Hz, 220 V 50/60 Hz, or 230 V 60 Hz for the 200 V class; three-phase and 400 V 50/60 Hz, 440 V 50/60 Hz, or 460 V 60 Hz for the 400 V class. If the input voltage is lower than 200 V for the 200 V class and 400 V for the 400 V class, the rated output power is not guaranteed.

*2: A for stand-alone system; N for NC system.

*3: AC reactor required for power supply input.

*4: 15-min rating

Note: Refer to the catalog for model details *.

Application Specific

Vector-controlled Inverter Drives for Machine Tools **VS-626MC5**

Catalog No. CHE-S626-8

Motor	Model UAASKA-□□	04	06	08	11	15
		Instantaneous Rated Output kW (min)	3.7 (15)	5.5 (30)	7.5 (30)	11 (30)
Continuous Rated Output* ¹ kW		2.2	3.7	5.5	7.5	11
Continuous Rated Torque N·m		14	23.6	35	47.7	70
Base Speed r/min		1500	1500	1500	1500	1500
Maximum Speed* ² r/min		6000	6000	6000	6000	6000
Rotor Inertia (GD ² /4)kg·m ²		0.009	0.017	0.026	0.038	0.064
Vibration		V5				
Noise Level		75 dB				
Overload Tolerance		120% of short time rated output for 1 min.				
Inverter	Model CIMR-MC5A□□□□	27P5		2011	2015	2018
	Power Supply	3-phase, 200/220 V 50 Hz, 200/220/230 V 60 Hz (voltage fluctuation: -15 to +10%)				
	Circuit Method	Sine wave PWM				
	Control Method	Vector Control				
	Braking Method	Resistance discharge braking				
	Speed Control Range	40 to 6000 r/min (without PG)				
	Speed Regulation	0.2% of maximum speed or below				
	Overload Capacity	150% of rated output current for 1 min				
Speed Command Input	±10 Vdc (+forward and -reverse) or +10 Vdc (forward and reverse signals)					

*1: Rated output power is guaranteed when input voltage is 200 V 50/60 Hz, 220 V 50/60 Hz, 230 V 60 Hz. If input voltage is lower than 200 V, rated output power is not guaranteed.

*2: Output characteristics for the motor may vary between 4500 and 6000 r/min.

Application Specific

High-frequency Inverter VS-646HF5

200 V Class

Model CIMR-HF5A□□□□		22P2	23P7	27P5
Output	Rated Output Capacity kVA	3	6	12
	Rated Output Current A	9	18	36
	Max. Output Voltage	230 V (proportional to input voltage)		
	Max. Output Frequency	7 kHz		
Power	Rated Voltage/Rated Frequency	3-phase, 200/220 V 50 Hz, 200/230 V 60 Hz		
	Allowable Voltage Fluctuation	Voltage: -15 to +10%; voltage imbalance: within ±3%		
	Allowable Frequency Fluctuation	±5%		
Control Characteristics	Control Method	PAM		
	Frequency Control Range	1 : 20		
	Frequency Accuracy (Temperature Fluctuation)	Digital reference: ±0.01% (-10 to +40°C) Analog reference: ±0.3% (25 ±10°C)		
	Overload Tolerance	150% of rated output current for 1 min	120% of rated output current for 1 min	
	Frequency Setting Signal	0 to 10 Vdc (20 kΩ)		
	Accel/Decel Time	0.1 to 60.0 s (accel time); 0.1 to 60.0 s (decel time)		
	Accel/Decel Voltage Forcing	80% to 120% of set voltage		
	Braking Method	Regenerative and DC braking		
	Voltage/Frequency Setting	Any 10-point setting available		
	Operation Input	Operation Method	Digital operator, external contact signal, serial transmission (RS-232C)	
Test Mode		1 to 10 Hz (low speed run), operation available from external input		
Frequency Setting Signal		Digital input (digital operator, serial transmission) Analog input (main/aux speed, 10 V/100% from external input)		
Coast to Stop		Available by external baseblock signal		

Other

Power Regenerative Sine Wave PWM Converter VS-656DC5

Catalog No. KAEP C710656 00

Voltage Class		200 V				400 V					
Model CIMR-D5A□□□□		2015	2022	2037	2075	4015	4022	4030	4045	4075	4160
Input/Output Ratings	Rated Output Capacity kW	20	30	50	90	20	30	40	60	100	185
	Rated Output Current (DC) A	60	90	150	280	30	45	60	90	150	280
	Rated Input Current (AC) A	64	96	160	300	32	48	64	96	165	300
	Rated Output Voltage	330 Vdc				660 Vdc					
Input Power Supply	Voltage and Frequency	200 to 220 Vac, 50 Hz ; 200 to 230 Vac, 60 Hz				380 to 460 Vac, 50/60 Hz					
	Allowable Voltage Fluctuation	-15 to +10%									
	Allowable Frequency Fluctuation	±3 Hz/300 ms (phase rotation free)									
Control Characteristics	Control Method	Sine wave PWM									
	Input Power Factor	0.95 or more (rated current)									
	Output Voltage Accuracy	±5%									
	Overload Tolerance	150% of rated output current for 1 min									
Operation Input		By digital operator and/or control circuit terminal									
Status Output	Fault	N.O./N.C. contact output									
	During Run	N.O. contact output									
	Alarm	2 multi-function photocoupler output terminals									
	Analog Output	2 multi-function analog terminals									

Other

Power Regenerative Unit VS-656RC5

Catalog No. KAE-S656-3

Voltage Class		200 V									400 V												
Model CIMR-R5A□□□□		23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	
Rating	Rated Capacity kW	3.7	5.5	7.5	11	15	18.5	22	30	37	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	
	Rated DC Current A	13	19	26	37	51	64	77	102	126	6	9	13	19	26	32	37	51	64	77	96	128	
	Rated Current on Power Side A	10	15	20	30	40	50	60	80	100	5	7.5	10	15	20	25	30	40	50	60	75	100	
	Regenerative Torque	150% for 30 s, 100% for 1 min, 25% ED, 80% continuous																					
Power	Voltage and Frequency	200 to 220 Vac, 50 Hz ; 200 to 230 Vac, 60 Hz									380 to 460 Vac, 50/60 Hz												
	Allowable Voltage Fluctuation	-15 to +10%																					
	Allowable Frequency Fluctuation	±3 Hz/300 ms (phase rotation free)																					
	Imbalance between Phases	Within 2%*																					
Control Characteristics	Control Method	120° current conduction																					
	Input Power Factor	0.9 or more																					
	Overload Tolerance	150% of rated output current for 30 s																					
Operation Input		Four external terminals (MANUAL RUN, AUTO RUN, EXFLT, RESET)																					
Status Output	Fault (FAULT)	N.O./N.C. Contact Output																					
	Photocoupler Output	2 photocoupler outputs (CONV READY, RUN)																					
	Analog Output	1 multi-function analog output terminal (defaulted for output current)																					

* Use the VS-656RC5 unit with larger output capacity if the imbalance rate between phases exceeds 2%.
Imbalance rate between phases can be calculated using the following formula (in conformance with IEC1800-3).

$$\text{Imbalance rate between phases [\%]} = \frac{\text{Max. voltage} - \text{Min. voltage}}{\text{Three-phase average voltage}} \times 67$$

- Notes 1: Use one VS-656RC5 regenerative unit with one inverter. Do not connect more than one inverter.
 2: Use a VS-656RC5 regenerative unit whose capacity is equal to or greater than that of the inverter to be connected.
 3: Use the specified AC reactor for power-supply coordination or current control, a fuse, and a fuse holder.
 4: Use a VS-656RC5 regenerative unit with a three-phase power supply and not a single-phase power supply.
 5: If the power supply is a generator, contact your YASKAWA representative to check the capacity of the generator.

Super Energy-saving Medium-voltage Inverter **FSDrive-MV1S**

Catalog No. KAEP C710687 00

Voltage Class		3 kV										6 kV										
Model	CIMR-MV1S*A□□□ (3 kV)	132	200	315	450	630	900	13C	15C	18C	25C	250	400	630	900	13C	18C	25C	30C	36C	43C	50C
	CIMR-MV1S*C□□□ (6 kV)																					
Max. Applicable Motor Capacity* ¹ kW		132	200	315	450	630	900	1250	1500	1800	2500	250	400	630	900	1250	1800	2500	3000	3600	4300	5000
Output Rating	Nominal Capacity kVA	200	285	400	570	800	1150	1500	1900	2300	3000	400	570	800	1150	1600	2300	3000	3800	4600	5300	6000
	Rated Output Current A	35	50	70	100	140	200	260	330	400	520	35	50	70	100	140	200	260	330	400	460	520
	100% Continuous																					
	Rated Voltage	3-phase, 3/3.3 kV (sine wave)										3-phase, 6/6.6 kV (sine wave)										
Rated Frequency		50/60 Hz																				
Power	Main Circuit (Input Voltage)	3-phase, 3/3.3 kV ±10%, 50/60 Hz ±5%										3-phase, 6/6.6 kV ±10%, 50/60 Hz ±5%										
	Control Circuit	3-phase, 200/220 V 380/400/440 V ±10%, 50/60 Hz ±5%, 3 kVA or more																				
Efficiency		Approx. 97%																				
Power Factor		0.95 or more																				
Cooling Method		Forced air-cooling with operation check switch																				
Control Characteristics	Control Method	Open Loop Vector Control, Flux Loop Vector Control, V/f Control (for multiple motor operation)																				
	Main Circuit	Voltage-type serial multi-PWM control																				
	Frequency Control Range	0.01 to 120 Hz																				
	Speed Control Accuracy	±0.5% (Open Loop Vector Control)										±0.02% (Flux Loop Vector Control)										
	Analog Input Resolution	0.03 Hz																				
	Accel/Decel Time	0.1 to 6000 s																				
	Main Control Functions	Momentary power loss ride-thru* ² , Torque limit, Accel stall prevention, Catching the coast, Operation prohibition at specified speeds, S-curve accel/decel, Multi-step speed operation, KEB function, Energy saving control																				
Protective Functions		Overcurrent, Overvoltage, Undervoltage, Output ground fault, Output open-phase, Cooling-fan error, Overload, Motor overheat...																				
Communication (Optional)		Modbus, CP-215, CP-218 (Ethernet), and other communications																				

*1: The motor capacity (kW) refers to a Yaskawa 4-pole motor.

*2: A separate UPS (uninterruptible power supply) is needed for the control board to restart after momentary power loss.

Notes 1: Asterisk indicates input voltage and frequency (A: 3 kV class 60 Hz, B: 3 kV class 50 Hz, C: 6 kV class 60 Hz, D: 6 kV class 50 Hz).

2: FSDrive-MV1S does not have regenerative braking capabilities.

Super Energy-saving Medium-voltage Matrix Converter **FSDrive-MX1S**
Medium-voltage Matrix Converter for Systems **FSDrive-MX1H**

Catalog No. KAEP C710688 00

Voltage Class		3 kV										6 kV									
Model	CIMR-MX1S*A□□□ (3 kV)	132	200	315	450	630	900	13C	18C	25C	250	400	630	900	13C	18C	25C	36C	50C		
	CIMR-MX1S*C□□□ (6 kV)																				
	CIMR-MX1H*A□□□ (3 kV)																				
	CIMR-MX1H*C□□□ (6 kV)																				
Max. Applicable Motor Capacity* ¹ kW		132	200	315	450	630	900	1250	1500	1800	2500	250	400	630	900	1250	1800	2500	3600	5000	
Output Rating	Nominal Capacity kVA	200	285	400	570	800	1150	1500	1900	2300	3000	400	570	800	1150	1600	2300	3000	4600	6000	
	Rated Output Current A	35	50	70	100	140	200	260	400	520	35	50	70	100	140	200	260	400	520		
	100% Continuous																				
	Rated Voltage	3-phase, 3/3.3 kV (sine wave)										3-phase, 6/6.6 kV (sine wave)									
Rated Frequency		50/60 Hz																			
Power	Main Circuit (Input Voltage)	3-phase, 3/3.3 kV ±10%, 50/60 Hz ±5%										3-phase, 6/6.6 kV ±10%, 50/60 Hz ±5%									
	Control Circuit	3-phase, 200/220 V 380/400/440 V ±10%, 50/60 Hz ±5%, 3 kVA or more																			
Matrix Converter Efficiency		Approx. 98%																			
Matrix Converter Power Factor		0.95 or more																			
Cooling Method		Forced air-cooling with operation check switch																			
Control Characteristics	Control Method	Open Loop Vector Control, Flux Loop Vector Control																			
	Main Circuit	Matrix converter with multi-output connected in a series																			
	Frequency Control Range	0.01 to 120 Hz																			
	Speed Control Accuracy	±0.5% (Open Loop Vector Control)										±0.02% (Flux Loop Vector Control)* ³									
	Analog Input Resolution	0.03 Hz																			
	Accel/Decel Time	0.1 to 6000 s																			
	Main Control Functions	Momentary power loss ride-thru* ² , Torque limit, Accel stall prevention, Catching the coast, Operation prohibition at specified speeds, S-curve accel/decel, Multi-step speed operation, Torque control* ³																			
Protective Functions		Overcurrent, Overvoltage, Undervoltage, Output ground fault, Output open-phase, Cooling-fan error, Overload, Motor overheat...																			
Communication (Optional)		Modbus, CP-215, CP-218 (Ethernet), and other communications																			

*1: The motor capacity (kW) refers to a Yaskawa 4-pole motor.

*2: When the restart function for the momentary power loss is used, an uninterruptible power supply unit for the control power supply is needed optionally.

*3: When using FSDrive-MX1H, speed control accuracy may fluctuate ±0.01% in Flux Loop Vector Control. Torque control also possible.

Note: Asterisk indicates input voltage and frequency (A: 3 kV class 60 Hz, B: 3 kV class 50 Hz, C: 6 kV class 60 Hz, D: 6 kV class 50 Hz).