

**YASKAWA**

# YASKAWA AC DRIVES



Yaskawa AC Drives  
The Global Leader in Quality and Reliability

Certified for  
ISO9001 and  
ISO14001



JQA-QMA14913 JQA-EM0202

# 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

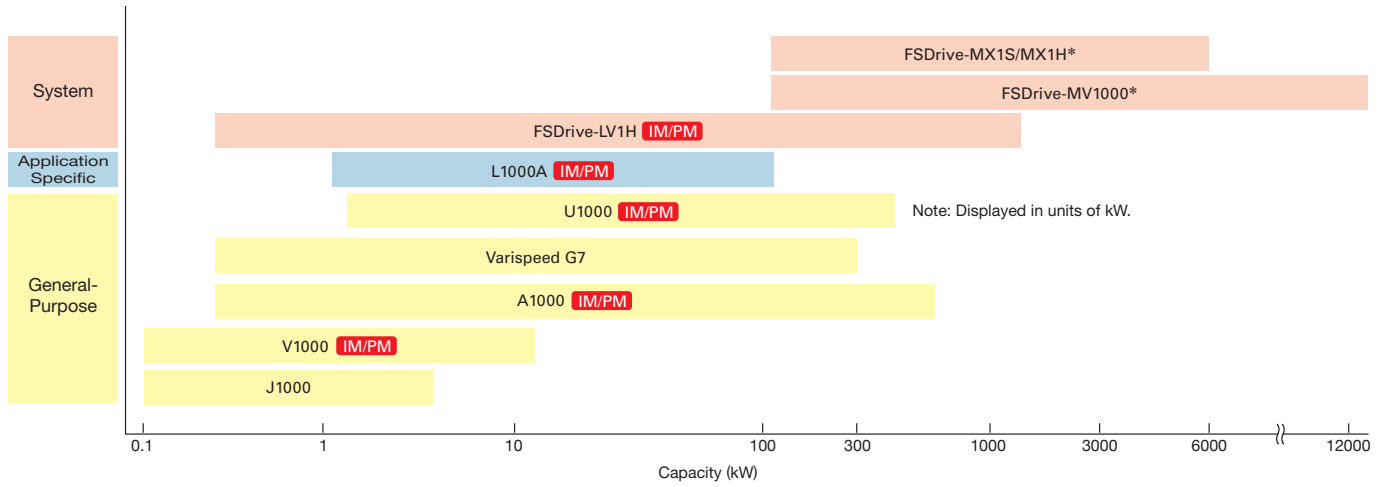
The most advanced digital technology and high-performance vector operation provide total control and high-speed response for DC motors.

AC Drive	Features	Model	Max. Motor Output (kW)					Control		Braking		Speed Control	
			0.1	1	10	100	1000	10000	V/f	Vector	Resistance	Regeneration	Range
General-Purpose	Compact V/f control	J1000 (V/f)	0.1 <input type="checkbox"/> 2.2 Single-phase 200 V					●		●		1:20 to 1:40	± 2 to 3*1
			0.1 <input type="checkbox"/> 5.5 Three-phase 200 V										
			0.2 <input type="checkbox"/> 5.5 Three-phase 400 V										
	Compact vector control	V1000 (V/f)	0.1 <input type="checkbox"/> 3.7 Single-phase 200 V					●		●		1:20 to 1:40	± 2 to 3*1
			0.1 <input type="checkbox"/> 18.5 Three-phase 200 V (Open Loop Vector)										
			0.2 <input type="checkbox"/> 18.5 Three-phase 400 V (Open Loop Vector for PM)										
	High performance vector control	A1000 (V/f)	0.4 <input type="checkbox"/> 110 Three-phase 200 V					●		●		1:40	± 2 to 3*1
			0.4 <input type="checkbox"/> 630 Three-phase 400 V (Advanced Open Loop Vector for PM)										
			0.4 <input type="checkbox"/> 110 Three-phase 200 V (V/f with PG)										
			0.4 <input type="checkbox"/> 630 Three-phase 400 V (Closed Loop Vector)										
			0.4 <input type="checkbox"/> 630 Three-phase 400 V (Closed Loop Vector for PM)										
			0.4 <input type="checkbox"/> 630 Three-phase 400 V (Closed Loop Vector for PM)										

\*1: Varies according to motor slip

\*2: When using an IPM motor


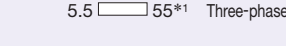










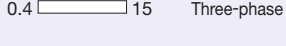















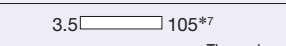



## AC Drive Series



**IM/PM** Indicates drives can run both induction and permanent magnet motors.  
 \* Max. motor output expressed in kVA for FSDrive-M products.

	Torque Control	Rated/Max. Freq. or Rated/Max. Speed	Global Safety Standards	Protective Design	Product Overview
	—	60/400 Hz	CE, UL/cUL	Open chassis and finless type (no heatsink)	<p style="text-align: right;">Catalog No. KAEP C710606 24</p> <ul style="list-style-type: none"> <li>• Compact design, easy operation</li> <li>• Overexcitation braking enables emergency braking without the use of a braking resistor.</li> <li>• Braking transistor standard in all models</li> <li>• Side-by-side installation and DIN rail mounting.</li> <li>• Hassle-free maintenance</li> <li>• All models are fully compliant with the EU's RoHS directive.</li> </ul>
	—	60/400 Hz When using SMRA Series motor 3600 r/min, 1800 r/min When using SMRD Series motor 3600 r/min, 1800 r/min When using EMR1 Series motor 3600 r/min, 1750 r/min, 1450 r/min, 1150 r/min	CE, UL/cUL ISO/EN13849-1 Cat.3 PLd, IEC/EN61508 SIL2	Open chassis, enclosed wall-mounted (NEMA Type1), finless type (no heatsink), and fully-enclosed waterproof type (NEMA Type 4X/IP66)	<p style="text-align: right;">Catalog No. KAEP C710606 08</p> <ul style="list-style-type: none"> <li>• Compact, high-performance (Open Loop Vector Control)</li> <li>• For both induction motors and synchronous motors (IPMM/SPMM)</li> <li>• 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.</li> <li>• Set main parameters automatically with Application Presets.</li> <li>• Detachable terminal block with memory for easy maintenance.</li> <li>• All models are fully compliant with the EU's RoHS directive.</li> </ul>
	—	60/400 Hz	CE, UL/cUL	Open-chassis (IP00) and enclosed (NEMA Type1)	<p style="text-align: right;">Catalog No. KAEP C710616 22</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Amazing energy savings and an even more compact setup with a synchronous motor.</li> <li>• Powerful torque at 0 Hz.</li> <li>• Loaded with Auto-Tuning features.</li> <li>• Easily adjust settings for connected machinery.</li> <li>• Breeze-easy setup by simply selecting the appropriate application.</li> <li>• Use DriveWorksEZ to customize your drive, included with all models.</li> <li>• All models are fully compliant with the EU' s RoHS directive.</li> </ul>
	—	When using SSR1 Series motor 1750 r/min, 1450 r/min, 1150 r/min	Two Safe Disable inputs and 1EDM output according to ISO/EN13849-1 Cat. 3 PLd, IEC/EN61508 SIL2		
	Yes				
	Yes				









AC Drive	Features	Model	Max. Motor Output (kW) 0.1 1 10 100 1000 10000	Control		Braking		Speed Control		
				V/f	Vector	Resistance	Regeneration	Range	Accuracy (%)	
General-Purpose	 Low Harmonics Regenerative Matrix Converter	U1000 (V/f)	 5.5  55*1 Three-phase 200 V	●			●	1 : 40	±2 to 3*3	
		U1000 (V/f with PG)		●			●	1 : 40	±0.03	
		U1000 (Open Loop Vector)			●			●	1 : 200	±0.2
		U1000 (Closed Loop Vector)			●			●	1 : 1500	±0.02
		U1000 (Advanced Open Loop Vector for PM)			●			●	1 : 20 1 : 100*2	±0.2
		U1000 (Closed Loop Vector for PM)			●			●	1 : 1500	±0.02
	 High-function fully vector control	Varispeed G7 (V/f)	 0.4  110 Three-phase 200 V	●				1:20 to 1:40	±2 to 3*3 (±1*4) (±0.03*5)	
		Varispeed G7 (Open Loop Vector)			●			1:200	±0.2	
		Varispeed G7 (Flux Loop Vector)			●			1:1000	±0.02	
	 Environmentally friendly motor drives	Varispeed AC (V/f)	 5.5  45 Three-phase 200 V	●				1:10	±2 to 3*1 (±1*2)	
		Varispeed AC (Open Loop Vector)			●			1:10	±0.2	
		Varispeed AC (Flux Loop Vector)			●			1:1000	±0.05	
	 Compact and energy efficiency drives	V1000 (Open Loop Vector for PM)	 0.4  15 Three-phase 200 V		●			1 : 10 (variable torque)	±0.2	
		ECOiPM motor EMR1 Series		 0.4  15 Three-phase 400 V		●				
	 Super compact and environmentally drives	V1000 (Open Loop Vector for PM)	 0.1  0.75 Three-phase 200 V		●			1 : 10 (variable torque)	±0.2	
V1000pico motors SMRD Series					●					
Application Specific	 Elevator applications	L1000A (V/f with PG)	 1.5  110 Three-phase 200 V		●		1:1500	±0.02		
		L1000A (Closed Loop Vector for PM)		 1.5  110 Three-phase 400 V		●				
Energy-Saving Unit	 Power regenerative converter	D1000	 5.0  130*6 Three-phase 200 V  5.0  630*6 Three-phase 400 V				●	—	—	
	 Power regenerative unit	R1000	 3.5  105*7 Three-phase 200 V  3.5  300*7 Three-phase 400 V				●	—	—	

\*1: Displayed in units of kW. The rated output current of the drive should be equal to or greater than the motor rated current. \*2: When using Advanced Open Loop Vector Control for PM

	Torque Control	Rated/Max. Freq. or Rated/Max. Speed	Global Safety Standards	Protective Design	Product Overview
	—	60/400Hz When using an SSR1 Series motor 1750min <sup>-1</sup> 1450min <sup>-1</sup> 1150min <sup>-1</sup>	CE UL/cUL  Two Safe Disable inputs and 1EDM output according to ISO/EN13849-1 Cat.3 Ple, IEC/EN61508 SIL3	Open chassis (IP00) and enclosed wall-mounted type (NEMA Type1)	<b>Catalog No. KAEP C710636 02</b>
	—				<ul style="list-style-type: none"> <li>· Drastically reduced power supply harmonics and improved harmonics environment.</li> <li>· Uses power regeneration for even greater energy efficiency.</li> <li>· The all-in-one design both reduces wiring and saves space.</li> <li>· Capable of driving any kind of motor.</li> <li>· U1000 runs not only induction motors, but also synchronous motors like IPM and SPM motors without speed sensors or pole sensors.</li> <li>· Powerful torque at 0 Hz</li> <li>· DriveWorksEZ customizes your drives. Included with all models.</li> <li>· All models are fully compliant with the EU' s RoHS directive.</li> <li>· Switching to and from commercial power is possible without phase detectors, contactors, and other such peripheral devices.</li> </ul>
	Yes				
	—				
	Yes				
	—	60/400 Hz	CE, UL/cUL	Open-chassis and enclosed (NEMA Type 1)	<b>Catalog No. KAE-S616-60</b>
	—	60/400 Hz When using Vector motors 1750/2100 r/min 1450/1740 r/min 1150/1380 r/min			<ul style="list-style-type: none"> <li>· The "3-level control method" solves micro surge problem for 400 V class drives.</li> <li>· Open Loop Vector: over 150% torque at 0.3 Hz. Flux Loop Vector: 150% at 0 Hz.</li> <li>· Removable control circuit terminals and cooling fan</li> <li>· Various application software (cranes, hoist, energy-saving control, and more)</li> <li>· Auto-Tuning function</li> </ul>
	Yes				
	—	60/120 Hz	CE, UL/cUL	Open-chassis and enclosed (NEMA Type 1)	<b>Catalog No. KAEP C710636 00</b>
	—				<ul style="list-style-type: none"> <li>· World's first matrix converter, directly converting input AC power into AC output. Features new regenerative capabilities.</li> <li>· High efficiency with a simple design and incredibly low harmonic distortion.</li> </ul>
	Yes				
	—	60/400 Hz	—	Open-chassis (models without heatsink also available) and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> <li>· Grade higher than IE3 efficiency class saves energy during operation.</li> <li>· V1000 drives combined with compact ECOiPM motors make more compact and lighter drive systems.</li> <li>· Less maintenance because bearing grease life is approx. three times longer compared to use with induction motors.</li> <li>· Improved reliability with elimination of an encoder of precision device.</li> </ul>
	—	3600 r/min, 1750 r/min, 1450 r/min, 1150 r/min	IP44		
	—	60/400 Hz	—	Open-chassis (models without heatsink also available) and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> <li>· V1000 drives combined with super compact V1000pico motors make more compact and lighter drive systems.</li> <li>· Applicable in locations subject to water jets or abrasive powder with its protective enclosure rated IP65 or higher.</li> <li>· Improved reliability with elimination of an encoder of precision device.</li> <li>· Use of V1000 drives, which can control not only induction motors but also synchronous motors, brings the uniformity of your stock.</li> </ul>
	—	SMRD Series:3600 r/min, 1800 r/min	SMRD Series: IP65		
	Yes	60/120 Hz	CE, UL/cUL  Two Safe Disable inputs and 1EDM output according to ISO/EN13849-1 Cat. 3 PLd, IEC/EN61508 SIL2	Open-chassis (IP00) and enclosed (NEMA Type1)	<ul style="list-style-type: none"> <li>· Cutting-edge drive technology allows L1000A to run a newly installed gearless synchronous motor, or a refurbished geared induction motor. This minimizes equipment required for your application.</li> <li>· Interfaces to match gearless, synchronous motors and every type of absolute encoder.</li> <li>· Even without a load sensor, high-performance torque compensation and high-resolution absolute encoder eliminate rollback when the brake is released.</li> <li>· Output interrupt Satisfies safety requirements and Ensures a reliable elevator system.</li> <li>· Rescue Operation switches to backup battery or UPS in case of a power outage.</li> <li>· All standard models are compliant with the Europe's RoHS directive.</li> </ul>
	—	—	CE, UL/cUL	Open-chassis (IP00, IP20)	<b>Catalog No. KAEP C710656 03</b>
	—	—	CE, UL/cUL	Open-chassis (IP00) and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> <li>· Sine-wave PWM converter regenerates power supply.</li> <li>· Great energy-saving performance in combination with a drive.</li> <li>· Minimizes harmonic distortion.</li> <li>· High power factor enables more compact power supply equipment.</li> <li>· All standard products are fully compliant with the EU's RoHS directive.</li> </ul>
	—	—	CE, UL/cUL	Open-chassis (IP00) and enclosed (NEMA Type 1)	<b>Catalog No. KAEP C710656 05</b>
	—	—	CE, UL/cUL	Open-chassis (IP00) and enclosed (NEMA Type 1)	<ul style="list-style-type: none"> <li>· Power regenerative unit with both braking and regenerative functions.</li> <li>· Combine with a motor drive for impressive energy-saving performance.</li> <li>· All standard products are fully compliant with the EU's RoHS directive.</li> </ul>

\*3: Varies according to motor slip \*4: Slip compensation \*5: With PG \*6: Indicated in rated output capacity. \*7: Indicated in regeneration capacity.



AC Drive	Features	Model	Max. Motor Output (kW) 0.1 1 10 100 1000 10000	Control		Braking		Speed Control	
				V/f	Vector	Resistance	Regeneration	Range	Accuracy (%)
System	 Low-voltage inverters for systems (Drawer type / Fixed type)	FSDrive-LV1HM/F (V/f)	0.4 <input type="checkbox"/> 22 Three-phase 200 V (FSDrive-LV1HM)	●		●		1:40	±2 to 3*1
		FSDrive-LV1HM/F (Open Loop Vector)	0.4 <input type="checkbox"/> 45 Three-phase 400 V (FSDrive-LV1HM)		●	●		1:120	±0.2
		FSDrive-LV1HM/F (Closed Loop Vector)	55 <input type="checkbox"/> 185 Three-phase 400 V (FSDrive-LV1HF)		●	●		1:1500	±0.01
	 Low-voltage inverters for systems (Slim type)	FSDrive-LV1HS (V/f)	200 <input type="checkbox"/> 1000 Three-phase 400 V	●		●		1:20 to 1:40	$\left[ \begin{matrix} \pm 2 \text{ to } 3^{*1} \\ \pm 1^{*2} \\ \pm 0.03^{*3} \end{matrix} \right]$
		FSDrive-LV1HS (Open Loop Vector)	350 <input type="checkbox"/> 1750 Three-phase 690 V		●	●		1:100	±0.2
		FSDrive-LV1HS (Closed Loop Vector)			●	●		1:1500	±0.01
	 Low-voltage converter for systems (Slim type)	FSDrive-LC1HS (Sine Wave PWM)	200 <input type="checkbox"/> 1000 Three-phase 400 V  350 <input type="checkbox"/> 1750 Three-phase 690 V	—	—	—	●	—	—
	 Super energy-saving medium-voltage AC drives	FSDrive-MV1000 (V/f)	220 kVA <input type="checkbox"/> 2500 kVA Three-phase 2400 V (For use outside of Japan)	●				1:20	±2 to 3
		FSDrive-MV1000 (Open Loop Vector)	200 kVA <input type="checkbox"/> 3700 kVA Three-phase 3300 V		●			1:100	±0.5
		FSDrive-MV1000 (Closed Loop Vector)	280 kVA <input type="checkbox"/> 4500 kVA Three-phase 4160 V (For use outside of Japan)		●			1:1000	±0.02
		FSDrive-MV1000 (Closed Loop for SM)	400 kVA <input type="checkbox"/> 7500 kVA Three-phase 6600V  660 kVA <input type="checkbox"/> 12000 kVA Three-phase 11000 V		●			1:100	±0.5
	 Super energy-saving medium-voltage matrix converter	FSDrive-MX1S (Open Loop Vector)	200 kVA <input type="checkbox"/> 3000 kVA Three-phase 3300 V		●		●	1:100	±0.5
		FSDrive-MX1S (Closed Loop Vector)	505 kVA <input type="checkbox"/> 3750 kVA Three-phase 4160 V (For use outside of Japan)  400 kVA <input type="checkbox"/> 6000 kVA Three-phase 6600 V		●		●	1:1000	±0.02
	 Medium-voltage matrix converter for systems	FSDrive-MX1H (Open Loop Vector)	200 kVA <input type="checkbox"/> 3000 kVA Three-phase 3300 V		●		●	1:100	±0.2
		FSDrive-MX1H (Closed Loop Vector)	400 kVA <input type="checkbox"/> 6000 kVA Three-phase 6600 V		●		●	1:1000	±0.01

\*1: Varies according to motor slip \*2: Slip compensation \*3: With PG



	Torque Control	Rated/Max. Freq. or Rated/Max. Speed	Global Safety Standards	Protective Design	Product Overview
	—	60/400 Hz	—	Vertical self-stand type	<p style="text-align: right;">Catalog No. KAEP C710691 00</p>
	—				
	Yes				
	—	60/150 Hz	—	Vertical self-stand type	<ul style="list-style-type: none"> <li>· High-performance, system-oriented inverter</li> <li>· Six control modes are available.</li> <li>· The high-performance processor of its PLC improves the processing capability for intelligent operations.</li> <li>· High speed, high response</li> <li>· Highly precise, wide-range speed control</li> <li>· Highly precise torque control</li> <li>· Smooth operation at low speed</li> </ul>
	—				
	Yes				
	—	—	—	Vertical self-stand type	
	—	60/120 Hz	CE UL/cUL	Vertical self-stand type	<p style="text-align: right;">Catalog No. KAEP C710687 02</p> <ul style="list-style-type: none"> <li>· Significant downsizing helps this power cell facilitate transportation, installation, and maintenance.</li> <li>· High power factor (0.95% or more) and high efficiency (0.97% or more)</li> <li>· No harmonics with input sinusoidal waveforms</li> <li>· Applicable with existing motors because of quasi-sinusoidal waveforms</li> <li>· Products are compliant with major global standards.</li> </ul>
	—				
	Yes				
	—	60/120 Hz	—	Vertical self-stand type	<p style="text-align: right;">Catalog No. KAEP C710688 00</p> <ul style="list-style-type: none"> <li>· Lightning-quick acceleration or deceleration with power regeneration function</li> <li>· High power factor (0.95% or more)</li> <li>· No harmonics with input sinusoidal waveforms</li> <li>· Applicable with existing motors because of quasi-sinusoidal waveforms</li> </ul>
	—				
	—				
	—	60/120 Hz	—	Vertical self-stand type	<ul style="list-style-type: none"> <li>· Lightning-quick acceleration or deceleration with power regeneration function</li> <li>· High speed, quick response</li> <li>· Highly precise, wide-range speed control (<math>\pm 0.01\%</math>, 1: 1000)</li> <li>· Highly precise torque control (Linearity: <math>\pm 3\%</math>)</li> </ul>
	Yes				

# Matching Drive and Application

Application		Fluids					Metal Processing / Machine Tools													Elevators						
		Pumps	Fans	Blowers	Compressors	Gear Pumps	Presses	Wire Drawing Machines	Centrifugal Casting Machines	Automatic Lathes	Lathes	Capstan Lathes	Machining Centers	Machining Magazine Drives	Grinding Machines	Board Drills	Board Routers	Slicers	Dicing Machines	Planers	Elevators (High-speed)	Elevators (Low-speed)	Elevator Doors	Automatic Parking Devices		
Load	Load Type	Friction Load				●		●		●					●	●	●	●	●	●						
		Gravitational Load																				●	●		●	
		Fluid Load	●	●	●	●																				
		Inertia Load						●		●																
	Speed/Torque	Constant Torque				●	●	●	●			●		●	●	●	●	●	●	●	●	●	●	●		
		Constant Output									●		●												●	
		Variable Torque	●	●	●																					
		Variable Output								●	●		●												●	
Applicable AC Drive	General-Purpose	J1000	●	●																						
		V1000	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●				●	●		
		A1000 (V/f)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
		A1000 (Open Loop Vector)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
		A1000 (Closed Loop Vector)				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		U1000	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Varispeed G7 (V/f)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Varispeed G7 (Open Loop Vector)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Varispeed G7 (Flux Loop Vector)				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		ECOiPM Drive	●	●	●																					
	V1000pico Drive	●	●	●					●				●	●	●	●	●	●				●	●			
	Application Specific	L1000A																								
		D1000	●	●	●	●	●	●											●	●						
		R1000					●	●											●	●						
System	FSDrive-LV1HM																									
	FSDrive-LV1HF																									
	FSDrive-LV1HS																									
	FSDrive-LC1HS																									
	FSDrive-MV1000	●	●	●	●																					
	FSDrive-MX1S	●	●	●	●																					
	FSDrive-MX1H																									



# Global Field Networks

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# Standard Specifications

General-Purpose

## Compact V/f Control J1000

200 V Class

Catalog No. KAEP C710606 24

Model	Three-Phase CIMR-J□2A□□□□	0001	0002	0004	0006	0008 ☆	0010	0012	0018 ☆	0020	
	Single-Phase*1 CIMR-J□BA□□□□	0001	0002	0003	0006	—	0010	—	—	—	
Max. Applicable Motor Capacity*2	ND HD	0.2 0.1	0.4 0.2	0.75 0.4	1.1 0.75	1.5 1.1	2.2 1.5	3 2.2	3.7 3	5.5 3.7	
Output	Rated Output Capacity*3	ND*4 HD	0.5 0.3*6	0.7 0.6*6	1.3 1.1*6	2.3 1.9*6	3.0 2.6*7	3.7 3*7	4.6 4.2*7	7.5 5.3*7	
	Rated Output Current	ND*4 HD	1.2 0.8*6	1.9 1.6*6	3.5 (3.3)*5 3*6	6 5*6	8 6.9*7	9.6 8*7	12 11*7	17.5 14*7	
	Overload Tolerance	ND Rating: 120% of rated output current for 60 s, HD 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)									
	Rated Voltage/Rated Frequency	Three-phase AC power supply: 200 to 240 V 50/60 Hz, Single-phase AC power supply: 200 to 240 V 50/60 Hz, DC power supply: 270 to 340 V*8									
Power	Allowable Voltage Fluctuation	-15 to +10%									
	Allowable Frequency Fluctuation	±5%									

400 V Class

☆These models are available in Japan only.

Model	CIMR-J□4A□□□□	0001	0002	0004	0005	0007	0009	0011	
Max. Applicable Motor Capacity*9	ND HD	0.4 0.2	0.75 0.4	1.5 0.75	2.2 1.5	3 2.2	3.7 3	5.5 3.7	
Output	Rated Output Capacity*10	ND*4 HD*7	0.9 0.9	1.6 1.4	3.1 2.6	4.1 3.7	5.3 4.2	6.7 5.5	
	Rated Output Current	ND*4 HD*7	1.2 1.2	2.1 1.8	4.1 3.4	5.4 4.8	6.9 5.5	8.8 7.2	
	Overload Tolerance	ND Rating: 120% of rated output current for 60 s, HD 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 AC power supply: 380 to 480 V 50/60 Hz, DC power supply: 510 to 680 V*8							
	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 reference: within ±0.01% of the max. output frequency (-10 to +50°C) Analog reference: within ±0.1% of the max. output frequency (25 ±10°C)
Frequency Setting Resolution	Digital reference: 0.01 Hz Analog reference: 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*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. 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, 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 ...
Standards Compliant	· UL508C · IEC/EN61800-3, IEC/EN61800-5-1

\*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: Not compliant with the UL standards when using a DC power supply. To meet CE standards, fuses should be installed. For details, refer to the catalog for AC Drive J1000.

\*9: 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.

\*10: Rated output capacity is calculated with a rated output voltage of 440 V.

\*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: 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.

Note: ND = Normal Duty, HD = Heavy Duty

General-Purpose

# Compact Vector Control V1000

## 200 V Class

Catalog No. KAEP C710606 08

Model	Three-Phase CIMR-V□2A□□□□	0001	0002	0004	0006	0008☆	0010	0012	0018☆	0020	0030	0040	0056	0069	
Model	Single-Phase <sup>*2</sup> CIMR-V□BA□□□□	0001	0002	0003	0006	—	0010	0012	—	0018 <sup>*1</sup>	—	—	—	—	
Max. Applicable Motor Capacity <sup>*3</sup>	ND	0.2	0.4	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	
	kW HD	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	ND <sup>*5</sup>	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 <sup>*4</sup> kVA	HD	0.3 <sup>*7</sup>	0.6 <sup>*7</sup>	1.1 <sup>*7</sup>	1.9 <sup>*7</sup>	2.6 <sup>*8</sup>	3 <sup>*8</sup>	4.2 <sup>*8</sup>	5.3 <sup>*8</sup>	6.7 <sup>*8</sup>	9.5 <sup>*8</sup>	12.6 <sup>*8</sup>	17.9 <sup>*8</sup>	22.9 <sup>*8</sup>
	Rated Output	ND <sup>*5</sup>	1.2	1.9	3.5 (3.3) <sup>*6</sup>	6	8	9.6	12	17.5	19.6	30	40	56	69
	Current A	HD	0.8 <sup>*7</sup>	1.6 <sup>*7</sup>	3 <sup>*7</sup>	5 <sup>*7</sup>	6.9 <sup>*8</sup>	8 <sup>*8</sup>	11 <sup>*8</sup>	14 <sup>*8</sup>	17.5 <sup>*8</sup>	25 <sup>*8</sup>	33 <sup>*8</sup>	47 <sup>*8</sup>	60 <sup>*8</sup>
	Overload Tolerance	ND Rating: 120% of rated output current for 60 s. HD 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 (proportional to input voltage) Single-phase power supply: Three-phase 200 to 240 V (proportional to input voltage)													
Max. Output Frequency	400 Hz (user-set)														
Power	Rated Voltage/Rated Frequency	Three-phase AC power supply: 200 to 240 V 50/60 Hz, Single-phase AC power supply: 200 to 240 V 50/60 Hz, DC power supply: 270 to 340 V <sup>*9</sup>													
	Allowable Voltage Fluctuation	-15 to +10%													
	Allowable Frequency Fluctuation	±5%													

☆ These models are available in Japan only.

## 400 V Class

Model	Three-Phase CIMR-V□4A□□□□	0001	0002	0004	0005	0007	0009	0011	0018	0023	0031	0038	
Max. Applicable Motor Capacity <sup>*3</sup>	ND	0.4	0.75	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	
	kW HD	0.2	0.4	0.75	1.5	2.2	3	3.7	5.5	7.5	11	15	
Output	Rated Output	ND <sup>*5</sup>	0.9	1.6	3.1	4.1	5.3	6.7	8.5	13.3	17.5	23.6	29
	Capacity <sup>*10</sup> kVA	HD <sup>*8</sup>	0.9	1.4	2.6	3.7	4.2	5.5	7	11.3	13.7	18.3	23.6
	Rated Output	ND <sup>*5</sup>	1.2	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23	31	38
	Current A	HD <sup>*8</sup>	1.2	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18	24	31
	Overload Tolerance	ND Rating: 120% of rated output current for 60 s. HD 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 (proportional to input voltage)											
Max. Output Frequency	400 Hz (user-set)												
Power	Rated Voltage/Rated Frequency	Three-phase AC power supply: 380 to 480 V 50/60 Hz, DC power supply: 510 to 680 V <sup>*9</sup>											
	Allowable Voltage Fluctuation	-15 to +10%											
	Allowable Frequency Fluctuation	±5%											

- \*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: 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: Not compliant with the UL standards when using a DC power supply. To meet CE standards, fuses should be installed. For details, refer to the catalog for AC Drive V1000.
  - \*10: Rated output capacity is calculated with a rated output voltage of 440 V.
- Note: ND = Normal Duty, HD = Heavy Duty

## Common Specifications

	Items	Specifications
Control Characteristics	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 reference: within $\pm 0.01\%$ of the max. output frequency ( $-10$ to $+50^{\circ}\text{C}$ ) Analog reference: within $\pm 0.1\%$ of the max. output frequency ( $25 \pm 10^{\circ}\text{C}$ )
	Output Frequency Resolution	20 bit of maximum output frequency (parameter E1-04 setting)
	Frequency Setting Signal	Main frequency reference: 0 to +10 Vdc (20 k $\Omega$ ), 4 to 20 mA (250 $\Omega$ ), 0 to 20 mA (250 $\Omega$ ) 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	$\pm 0.2\%$ in Open Loop Vector Control ( $25 \pm 10^{\circ}\text{C}$ ) *11
	Speed Response	5 Hz in Open Loop Vector ( $25 \pm 10^{\circ}\text{C}$ ) (excludes temperature fluctuation when performing Rotational Auto-Tuning)
	Torque Limit	Open Loop Vector Control allows separate settings in four quadrants.
	Accel/Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
	Braking Torque	① Instantaneous decel torque*12: 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*13: 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, 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...
	Standards Compliant	· UL508C · IEC/EN61800-3, IEC/EN61800-5-1 · ISO/EN13849-1 Cat.3 PLd, IEC/EN61508 SIL2
Protection Design	IP20 open-chassis, NEMA Type 1 enclosure	

\*11: Speed control accuracy may vary slightly depending on installation conditions or motor used.

\*12: Momentary average deceleration torque refers to the deceleration torque from 60 Hz down to 0 Hz. This may vary depending on the motor.

\*13: 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-A□□2A□□□□		0004	0006	0008	0010	0012	0018☆	0021	0030	0040	0056	0069	0081	0110	0138	0169	0211	0250	0312	0360	0415	
Max. Applicable	ND	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	
Motor Capacity*1 kW	HD	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	ND*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
	Capacity*2 kVA	HD	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*5
	Rated Output	ND*3	3.5	6	8	9.6	12	17.5	21	30	40	56	69	81	110	138	169	211	250	312	360	415
	Current	A	HD	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
Output	Overload Tolerance	ND Rating: 120% of rated output current for 60 s HD 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)																				
Power	Max. Output Frequency	400 Hz (user-set)																				
	Rated Voltage/ Rated Frequency	Three-phase AC power supply: 200 to 240 V 50/60 Hz, DC power supply: 270 to 340 V*6																				
	Allowable Voltage Fluctuation	-15% to +10%																				
Power	Allowable Frequency Fluctuation	±5%																				

☆ These models are available in Japan only.

## 400 V Class

Model CIMR-A□□4A□□□□		0002	0004	0005	0007	0009	0011	0018	0023	0031	0038	0044	0058	0072	0088	0103	0139	0165	0208	0250	0296	0362	0414	0515	0675	0930	1200	
Max. Applicable	ND	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	220	250	355	500	630	
Motor Capacity*1 kW	HD	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	185	220	315	450	560	
Output	Rated Output	ND*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	316	392	514	709	915
	Capacity*7 kVA	HD	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	46*4	57*4	69*4	85*5	114*5	137*5	165*5	198*5	232*5	282*5	343*5	491*5	617*5	831*5
	Rated Output	ND*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	414	515	675	930	1200
	Current	A	HD	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*5	150*5	180*5	216*5	260*5	304*5	370*5	450*5	605*5	810*5
Output	Overload Tolerance	ND Rating: 120% of rated output current for 60 s HD 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)																								input V× 0.95		
Power	Max. Output Frequency	400 Hz (user-set)																										
	Rated Voltage/ Rated Frequency	Three-phase AC power supply: 380 to 480 V 50/60 Hz, DC power supply: 510 to 680 V*6																										
	Allowable Voltage Fluctuation	-15% to +10%																										
Power	Allowable Frequency Fluctuation	±5%																										

\*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: Not compliant with the UL standards when using a DC power supply. To meet CE standards, fuses should be installed. For details, refer to the catalog for AC Drive A1000.

\*7: Rated output capacity is calculated with a rated output voltage of 440 V.

Note: ND = Normal Duty, HD = Heavy Duty



## Common Specifications

Item	Specifications
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 referece: within $\pm 0.01\%$ of the max. output frequency ( $-10$ to $+40^{\circ}\text{C}$ ) Analog referece: within $\pm 0.1\%$ of the max. output frequency ( $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ )
Output Frequency Resolution	0.001 Hz
Frequency Setting Resolution	Main frequency reference: $-10$ to $+10$ Vdc, $0$ to $+10$ Vdc ( $20\text{ k}\Omega$ ), $4$ to $20$ mA ( $250\ \Omega$ ), $0$ to $20$ mA ( $250\ \Omega$ ) Main speed reference: Pulse train input (max. $32\text{ kHz}$ )
Starting Torque	$150\%/3\text{ Hz}$ (V/f Control and V/f Control with PG), $200\%/0.3\text{ Hz}^{*8}$ (Open Loop Vector Control), $200\%/0\text{ r/min}^{*8}$ (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	$\pm 0.2\%$ in Open Loop Vector Control ( $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ ) <sup>*9</sup> , $0.02\%$ in Closed Loop Vector Control ( $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ )
Speed Response	$10\text{ Hz}$ in Open Loop Vector ( $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ ), $50\text{ Hz}$ in Closed Loop Vector Control ( $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ ) (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 $6000.0\text{ s}$ (4 selectable combinations of independent acceleration and deceleration settings)
Braking Torque	① Short-time decel torque <sup>*10</sup> : over $100\%$ for $0.4/0.75\text{ kW}$ motors, over $50\%$ for $1.5\text{ kW}$ motors, and over $20\%$ for $2.2\text{ kW}$ and above motors (over excitation braking/High-Slip Braking: approx. $40\%$ ) ② Continuous regen. torque: approx. $20\%$ (approx. $125\%$ with dynamic braking resistor option <sup>*11</sup> : $10\%$ ED, $10\text{ s}$ )
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/decel time switch, S-curve accel/decel, 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, $115.2\text{ kbps}$ ), Fault restart, Application presets, DriveWorksEZ (customization function), Removable terminal block with parameter backup function...
Standards Compliant	· UL508C · IEC/EN61800-3, IEC/EN61800-5-1 · Two Safe Disable inputs and 1EDM output according to ISO/EN13849-1 Cat. 3 PLd, IEC/EN61508 SIL2
Protection Design	IP00 open-chassis, IP20 NEMA Type 1 enclosure <sup>*12</sup>

\*8: Requires a drive with recommended capacity.

\*9: Speed control accuracy may vary slightly depending on installation conditions or motor used. Contact Yaskawa for details.

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

\*11: If L3-04 is enabled when using a braking resistor or braking resistor unit, the motor may not stop within the specified deceleration time.

Drives of  $200/400\text{ V }30\text{ kW}$  (CIMR-A□2A0138/A□4A0072) or less have a built-in braking transistor.

\*12: Removing the top cover on the following models converts the NEMA Type 1 rating to IP20: CIMR-A□2A0004 to A□2A0081, CIMR-A□4A0002 to A□4A0044

General-Purpose

# Low Harmonics Regenerative Matrix Converter U1000

## 200 V Class

ND: Normal Duty, HD: Heavy Duty

Model CIMR-UA:		2:0028	2:0042	2:0054	2:0068	2:0081	2:0104	2:0130	2:0154	2:0192	2:0248		
Rated Input/Output	Rated Input	ND	25	38	49	62	74	95	118	140	175	226	
	Current* <sup>1</sup>	A	HD	20	25	38	49	62	74	95	118	140	175
	Rated Input	ND	12	17	22	28	34	43	54	64	80	103	
	Capacity* <sup>2</sup>	kVA	HD	9	12	17	22	28	34	43	54	64	80
	Rated Output	ND	28	42	54	68	81	104	130	154	192	248	
	Current* <sup>4*5</sup>	A	HD	22	28	42	54	68	81	104	130	154	192
Overload Tolerance		HD Rating: 150% of rated output current for 60 s, ND Rating: 120% of rated output current for 60 s (Derating may be required for repetitive loads)											
Carrier Frequency		4 kHz (User adjustable up to 10 kHz. Derating may be required.)											
Max. Output Voltage		Depends on input voltage											
Max. Output Frequency		400 Hz											
Rated Voltage/Rated Frequency		Three-phase AC power supply: 200 to 240 Vac 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		less than 2%											
Harmonic Current Distortion Rate* <sup>6</sup>		5% or less (IEEE 519)											
Input Power Factor		0.98 or more (for rated load)											

## 400 V Class

Model CIMR-UA:		4:0011	4:0014	4:0021	4:0027	4:0034	4:0040	4:0052	4:0065	4:0077	4:0096	4:0124	4:0156	
Rated Input/Output	Rated Input	ND	10	13	19	25	31	36	47	59	70	87	113	142
	Current* <sup>1</sup>	A	HD	8.7	10	13	19	25	31	36	47	59	70	87
Rated Input/Output	Rated Input	ND	9	12	17	22	28	33	43	54	64	80	103	130
	Capacity* <sup>3</sup>	kVA	HD	8	9	12	17	22	28	33	43	54	64	80
Rated Input/Output	Rated Output	ND	11	14	21	27	34	40	52	65	77	96	124	156
	Current* <sup>4*5</sup>	A	HD	9.6	11	14	21	27	34	40	52	65	77	96

Model CIMR-UA:		4:0180	4:0216	4:0240	4:0302	4:0361	4:0414	4:0477	4:0590	4:0720* <sup>7</sup>	4:0900* <sup>7</sup>	4:0930* <sup>7</sup>	
Rated Input/Output	Rated Input	ND	164	197	218	275	329	377	434	537	655	819	846
	Current* <sup>1</sup>	A	HD	142	164	197	218	275	329	377	434	537	655
Rated Input/Output	Rated Input	ND	150	180	200	251	300	344	396	490	598	748	773
	Capacity* <sup>3</sup>	kVA	HD	130	150	180	200	251	300	344	396	490	598
Rated Input/Output	Rated Output	ND	180	216	240	302	361	414	477	590	720	900	930
	Current* <sup>4*5</sup>	A	HD	156	180	216	240	302	361	414	477	590	720
Overload Tolerance		HD Rating: 150% of rated output current for 60 s, ND Rating: 120% of rated output current for 60 s (Derating may be required for repetitive loads)											
Carrier Frequency		CIMR-UA4□0011 to 4□0414: 4 kHz (User adjustable up to 10 kHz. Derating may be required.) CIMR-UA4□0477 to 4□0930: 3 kHz											
Max. Output Voltage		Depends on input voltage											
Max. Output Frequency		400 Hz											
Rated Voltage/Rated Frequency		Three-phase AC power supply: 380 to 480 Vac 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		less than 2%											
Harmonic Current Distortion Rate* <sup>6</sup>		5% or less (IEEE 519)											
Input Power Factor		0.98 or more (for rated load)											

\*1 : Assumes operation at the rated output current. This value may fluctuate based on the power supply side impedance, as well as the input current, power supply transformer, and wiring conditions.

\*2 : The rated input capacity is calculated by multiplying the power line voltage (240 V) by 1.1.

\*3 : The rated input capacity is calculated by multiplying the power line voltage (480 V) by 1.1.

\*4 : The rated output current of the drive should be equal to or greater than the motor rated current.

\*5 : This value assumes a carrier frequency of 4 kHz. Increasing the carrier frequency requires a reduction in current.

\*6 : When the harmonic current distortion rate is 5% or less, the maximum output voltage is calculated by multiplying input power voltage by 0.87.

You must also change the parameter from the default setting.

\*7 : Models CIMR-U□4□0720 to 4□0930 need installation of standard configuration device (harmonic filter module).

## Common Specifications

Catalog No. KAEP C710636 02

Item	Specifications
Control Method	V/f Control, V/f Control with PG, Open Loop Vector Control, Closed Loop Vector Control, Open Loop Vector Control for PM, Advanced Open Loop Vector Control for PM, Closed Loop Vector Control for PM
Frequency Control Range	0.01 to 400 Hz
Frequency Accuracy (Temperature Fluctuation)	Digital reference : within $\pm 0.01\%$ of the max. output frequency (-10 to +40°C) Analog reference : within $\pm 0.1\%$ of the max. output frequency (25 $\pm$ 10°C)
Frequency Setting Resolution	Digital reference : 0.01 Hz, Analog reference : 0.03 Hz / 60 Hz (11 bit)
Output Frequency Resolution	0.001 Hz
Frequency Setting Resolution	Main frequency reference : -10 to +10 Vdc, 0 to 10 Vdc (20 k), 4 to 20 mA (250), 0 to 20 mA (250) Main speed reference : Pulse train input (max. 32 kHz)
Starting Torque	V/f Control 150%/3 Hz V/f Control with PG 150%/3 Hz Open Loop Vector Control 200%/0.3 Hz*1 Closed Loop Vector Control 200%/0 min <sup>-1</sup> *1 Open Loop Vector Control for PM 100%/5% Speed Advanced Open Loop Vector Control for PM 200%/0 min <sup>-1</sup> *1 Closed Loop Vector Control for PM 200%/0 min <sup>-1</sup> *1
Speed Control Range	V/f Control 1 : 40 V/f Control with PG 1 : 40 Open Loop Vector Control 1 : 200 Closed Loop Vector Control 1 : 1500 Open Loop Vector Control for PM 1 : 20 Advanced Open Loop Vector Control for PM 1 : 100 Closed Loop Vector Control for PM 1 : 1500
Speed Control Accuracy	$\pm 0.2\%$ in Open Loop Vector Control (25 $\pm$ 10°C), $\pm 0.02\%$ in Closed Loop Vector Control (25 $\pm$ 10°C)*2
Speed Response	10 Hz in Open Loop Vector Control (25 $\pm$ 10°C), 250 Hz in Closed Loop Vector Control (25 $\pm$ 10°C) (excludes temperature fluctuation when performing Rotational Auto-Tuning)
Torque Limit	Parameters setting allow separate limits in four quadrants (available in OLV, CLV, AOLV/PM, CLV/PM)
Accel/Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
Braking Torque	Same value as overload tolerance
V/f Characteristics	User-selected programs and V/f preset patterns possible
Main Control Functions	Torque Control, Droop Control, Speed/Torque Control switch, Feed Forward Control, Zero Servo Control, Momentary Power Loss Ride-Thru, Speed Search, Synchronous Transfer with Commercial Power Supply, 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, Upper/lower limits for frequency reference, DC Injection Braking at start and stop, 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 functions), Removable Terminal Block with Parameter Backup, Online Tuning, Overexcitation Deceleration, Inertia (ASR) Tuning, High Frequency Injection, etc.
Standards Compliance	· UL508C · IEC/EN61800-3, IEC/EN61800-5-1 · Two Safe Disable inputs and 1 EDM output according to ISO/EN13849-1 Cat.3 Plc, IEC/EN61508 SIL3
Protection Design	IP00 open-chassis, IP20 NEMA Type 1 enclosure*3*4*5

\*1 : Current derating is required.

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

\*3 : Optional NEMA Type 1 kit is required.

\*4 : Removing the cover of changes the drive's NEMA Type 1 rating to IP20.

\*5 : Models CIMR-U400720 to 400930 is not compatible with NEMA Type 1 enclosure.

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	Three-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	Three-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	Three-phase, 380/400/415/440/460/480 V (proportional to input voltage)																							
	Max. Output Frequency	400 Hz by parameter settings*2*5																							
Power	Rated Voltage/Rated Frequency	Three-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*6, V/f Control, V/f with PG Control)
Starting Torque	150% at 0.3 Hz (Open Loop Vector Control 2)*7, 150% at 0 r/min (Flux Loop Vector Control)*7
Speed Control Range	1 : 200 (Open Loop Vector Control 2)*7, 1 : 1000 (Flux Loop Vector Control)*7
Speed Control Accuracy	±0.2%*9 (Open Loop Vector Control 2 at 25±10°C), ±0.02% (Flux Loop Vector Control at 25±10°C)*7
Speed Response	10 Hz (Open Loop Vector Control 2)*7, 40 Hz (Flux Loop Vector Control)*7
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)*8, 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: For 400 V class drives, the maximum output frequency value is limited by the carrier frequency setting and capacity. 90 to 110 kW: 250 Hz, 132 to 300 kW: 166 Hz. Contact your Yaskawa representative for details.
- \*6: Contact your Yaskawa representatives when using the Open Loop Vector Control 2 for an application with large regenerative power (hoists, etc.).
- \*7: 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.
- \*8: 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.
- \*9: The speed control accuracy depends on the installation conditions and type of motor used. Contact your Yaskawa representative for details.

General-Purpose

# Compact and Energy Efficiency ECOiPM Drive

## Motors

Output	kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Model EMR1- <input type="text"/>		20P4AFN-L	20P7AFN-L	21P5AFN-L	22P2AFN-S	23P7AFN-S	25P5AFN-S	27P5AFN-S	2011AFN-S	2015AFN-S
(Example of 200 V class 1750 r/min)*1										
Frame No.	3600 r/min	56	56	63A	63B	71	80	90A	90B	100
	1750 r/min	56	63A	63B	71	80	90A	90B	100	112
	1450 r/min	63A	63B	71	80	90A	90B	100	112	–
	1150 r/min	63A	63B	71	80	90A	–	–	–	–
Mounting	Flange-mounted type: Frame numbers up to 63B, Foot-mounted type: Frame numbers over 71									
Enclosure	Totally-enclosed externally fan-cooled (IP44)									
Rated Speed*2	3600/1750/1450/1150 r/min									
No. of Poles	10									
Speed Control Range	1:10 (variable torque) Note: Contact your Yaskawa representative for constant torque applications.									
Time Rating	Continuous									
Insulation Class	B: Frame numbers up to 80, F: Frame numbers from 90A									
Encoder	Without PG									
Environment	Ambient Temperature	–20 to +40°C								
	Ambient Humidity	90% RH or less (no condensation)								
	Area of Use	Indoors, non-explosion proof area (free from corrosive or explosive gas or vapor)								
	Altitude	Up to 1000 meters								
Rotation Direction	Counter clockwise from coupling (bidirectional possible)									
Coupling	Direct drive coupling or V-belt coupling Note: Contact your Yaskawa representative to learn about V-belt coupling when using a 3600 r/min motor.									
Coating	Munsell N1.5 (for indoor use)									
Standards Compliance	JEC-2100									
Options	With thermostat (for protection against overheating)									
Allowable Motor Load Characteristics										

\*1: The model designation depends on the voltage class and rated speed.

For motors in the 400 V class or of a rated speed other than those listed, contact your Yaskawa representative.

\*2: For the operations at the speed higher than 3600 r/min, contact your Yaskawa representative.

## Drives

200 V Class	Model CIMR-VA2A□□□□	0004	0006	0010	0012	0020	0030	0040	0056	0069	
		0003	0006	0010	0012	0018	–	–	–	–	–
	Rated Output Current (Heavy Duty) A	3.0	5.0	8.0	11.0	17.5	25.0	33.0	47.0	60.0	
	Rated Voltage/Rated Frequency	Three-phase AC power supply: 200 to 240 V 50/60 Hz, Single-phase AC power supply: 200 to 240 V 50/60 Hz, DC power supply: 270 to 340 V									
	Allowable Voltage Fluctuation	–15 to +10%									
	Allowable Frequency Fluctuation	±5%									
	Power Supply (Heavy Duty) kVA	1.3	2.7	3.4	5.0	8.6	11.0	17.0	24.0	31.0	
400 V Class	Model CIMR-VA4A□□□□	0001	0004	0005	0007	0011	0018	0023	0031	0038	
		1.2	3.4	4.8	5.5	9.2	14.8	18.0	24.0	31.0	
		Rated Voltage/Rated Frequency	Three-phase AC power supply: 380 to 480 V 50/60 Hz, DC power supply: 510 to 680 V								
		Allowable Voltage Fluctuation	–15 to +10%								
		Allowable Frequency Fluctuation	±5%								
		Power Supply (Heavy Duty) kVA	1.1	2.9	4.0	5.5	9.5	14.0	18.0	27.0	36.0

Note: For details on the drive specifications, refer to the catalog for AC Drive V1000 (catalog no. KAEPC71060608).

General-Purpose

# Super Compact and Environmentally V1000pico Drive

## Motors

Rated Output	kW	0.1	0.2	0.4	0.2	0.4	0.75
Model	SMRD- <input type="text"/>	20P1AE	20P2AE	20P4AE	20P2BE	20P4BE	20P7BE
Rated Speed	r/min	1800			3600		
Rated Current	A	0.64	1.0	1.9	1.5	2.6	4.2
No. of Poles		6					
Speed Control Range		1 : 10					
Time Rating		Continuous					
Insulation Class		B					
Insulation Tolerance		1500 Vac for one minute					
Insulation Resistance		500 Vdc 10 MΩ min.					
Encoder		Without PG					
Mounting		Flange-mounted type					
Protective Design		IP65 (excluding shaft opening and motor leads)					
Cooling Method		Totally enclosed self-cooled (includes heat dissipation from the flange surface toward the connected machine)					
Environment	Ambient Temperature	0 to +40°C					
	Ambient Humidity	20 to 80% RH (no condensation)					
	Area of Use	Indoors					
	Altitude	Up to 1000 meters					
	Vibration Resistance	49.0 m/s <sup>2</sup> or below					
Vibration Class		V15 at rated speed Note: The drive must be adjusted.					
Allowable Radial Load*1	N	245	245	245	245	245	245
Allowable Thrust Load*1	N	74	74	147	74	74	147
Motor Inertia (×10 <sup>-4</sup> )	kg·m <sup>2</sup>	0.255	0.438	1.57	0.255	0.438	1.57
Allowable Load Motor Inertia*2 (Motor shaft conversion)		For variable torque application: 50 times max. For constant torque application: 5 times max.					
Torque Characteristics	Rated Torque N·m	0.531	1.06	2.12	0.531	1.06	1.99
	Max. Starting Torque*3 N·m	0.796	1.59	3.18	0.796	1.59	2.985
Torque Characteristics*3	Allowable Load Characteristics*3	<p>Note: Outputs the torque at start in the shaded area.</p>					

\*1: If the value of shaft end load exceeds either the allowable radial load or allowable thrust load, or if an unbalanced rotating load occurs, contact your Yaskawa representative.  
 \*2: If the load motor inertia exceeds the allowable value, contact your Yaskawa representative.

\*3: Users are required to select a drive whose maximum load current is 150% or less of the drive rated current and to set the drive parameter for maximum torque (at high starting or low constant speed).  
 If a high starting torque is required, use a motor with an acceleration time of 3 seconds minimum and a load motor inertia (converted at the motor shaft) of 5 times maximum.

Notes: 1. The motor frame temperature must be 95°C or less.

2. To allow sufficient cooling, be sure to secure at least the following heat dissipation surface area on the motor connected machine side.

· Aluminum plate of 250 × 250 × 6 mm (or of dimensions that add up to a total surface area of 0.127 m<sup>2</sup>)

## Drives

Model	Three-phase 200 V	CIMR-VA2A□□□□	0001	0002	0004	0006
	Single-phase 200 V	CIMR-VABA□□□□	0001	0002	0003	0006
Max. Applicable Motor Capacity	kW	0.1	0.2	0.4	0.75	
Rated Output Current	A	0.8	1.6	3	5	
Power	Rated Voltage/Rated Frequency	Three-phase AC power supply: 200 to 240 V 50/60 Hz Single-phase AC power supply: 200 to 240 V 50/60 Hz				
	Allowable Voltage Fluctuation	-15 to +10%				
	Allowable Frequency Fluctuation	±5%				
	Power Supply	kVA	Three-phase	0.3	0.7	1.3
Single-phase			0.4	0.7	1.5	2.9

Note: For details on the drive specifications, refer to the catalog for AC Drive V1000 (catalog no. KAEP71060608).

# Elevator applications L1000A

## 200 V Class

Model	CIMR-LT2A□□□□	0008	0011	0018	0025	0033	0047	0060	0075	0085	0115	0145	0180	0215	0283	0346	0415	
Max. Applicable Motor Capacity*1	kW	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*2	kVA	3*3	4.2*3	6.7*3	9.5*3	12.6*3	17.9*3	23*3	29*3	32*3	44*3	55*4	69*4	82*4	108*4	132*4	158*4
	Rated Output Current	A	8*3	11*3	17.5*3	25*3	33*3	47*3	60*3	75*3	85*3	115*3	145*4	180*4	215*4	283*4	346*4	415*4
	Overload Tolerance	150% of rated output current for 60 s																
	Max. Output Voltage	Three-phase 200 to 240 V (proportional to input voltage)																
	Max. Output Frequency	120 Hz (user adjustable)																
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-LT4A□□□□	0005	0006	0009	0015	0018	0024	0031	0039	0045	0060	0075	0091	0112	0150	0180	0216	
Max. Applicable Motor Capacity*1	kW	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*5	kVA	3.7*3	4.2*3	7*3	11.3*3	13.7*3	18.3*3	24*3	30*3	34*3	48*3	57*3	69*3	85*4	114*4	137*4	165*4
	Rated Output Current	A	4.8*3	5.5*3	9.2*3	14.8*3	18*3	24*3	31*3	39*3	45*3	60*3	75*3	91*3	112*4	150*4	180*4	216*4
	Overload Tolerance	150% of rated output current for 60 s																
	Max. Output Voltage	Three-phase 380 to 480 V (proportional to input voltage)																
	Max. Output Frequency	120 Hz (user adjustable)																
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	Specification	
Control Characteristics	Control Method	V/f Control, Open Loop Vector Control, Closed Loop Vector Control, Closed Loop Vector Control for PM
	Frequency Control Range	0.01 to 120 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±10°C)
	Output Frequency Resolution	0.001 Hz
	Frequency Setting Resolution	Main frequency reference: -10 to +10 Vdc (20 kΩ), 0 to +10 Vdc (20 kΩ), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω)
	Starting Torque	150% / 3 Hz (V/f Control)      200% / 0 r/min (Closed Loop Vector Control) 200% / 0.3 Hz (Open Loop Vector Control)*6      200% / 0 r/min (Closed Loop Vector Control for PM)
	Speed Control Range	1 : 40 (V/f Control)      1 : 1500 (Closed Loop Vector Control) 1 : 200 (Open Loop Vector Control)*6      1 : 1500 (Closed Loop Vector Control for PM)
	Speed Control Accuracy	±0.2% in Open Loop Vector Control (25±10°C)*6 *7, ±0.02% in Closed Loop Vector Control (25±10°C)
	Speed Response	10 Hz in Open Loop Vector Control (25±10°C)*6, 50 Hz in Closed Loop Vector Control (25±10°C) (excludes temperature fluctuation when performing Rotational Auto-Tuning)
	Torque Limit	All vector control modes allow 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	Approximately 125% when using a braking resistor option
	V/f Characteristics	User-selected programs and V/f preset patterns possible
	Main Control Functions	Torque compensation at start (with or without sensors), Auto-Tuning (for motor and encoder offset), braking sequence, Feed Forward, Short Floor, Rescue Operation using back-up power supply, Light Load Direction Search, Removable Terminal Block with Parameter Backup...
Standards Compliant	<ul style="list-style-type: none"> <li>UL508C</li> <li>IEC/EN61800-3, IEC/EN61800-5-1</li> <li>Two Safe Disable inputs and 1EDM output according to ISO/EN13849-1 Cat. 3 PLd, IEC/EN61508 SIL2</li> </ul>	
Protective Design	IP00 open-chassis, NEMA Type 1 enclosure*8	

\*1: The motor capacity (kW) refers to a Yaskawa 4-pole induction motor (200 V, 60 Hz). 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: Carrier frequency is set to 8 kHz. Current derating is required in order to raise the carrier frequency.

\*4: Carrier frequency is set to 5 kHz. Current derating is required in order to raise the carrier frequency.

\*5: Rated output capacity is calculated with a rated output voltage of 440 V.

\*6: Auto-Tuning must be performed prior to operating in Open Loop Vector Control to achieve the performance specifications listed above.

\*7: Speed control accuracy may vary slightly depending on installation conditions or motor used. Contact Yaskawa for details.

\*8: Removing the top cover on the following models converts the NEMA Type 1 rating to IP20: CIMR-LA2A0008 to 2A0075, CIMR-LA4A0005 to 4A0039

# Power regenerative converter D1000

## D1000 Energy-saving Unit

Catalog No. KAEP C710656 03

Voltage		200 V Class							400 V Class												
Model CIMR-DA*1A		0005	0010	0020	0030	0050	0065	0090	0130	0005	0010	0020	0030	0040	0060	0100	0130	0185	0270	0370	0630
Max. Applicable Motor Capacity kW		3.7	7.5	15	22	37	55	75	110	3.7	7.5	15	22	30	45	75	110	160	220	315	560
Rating	Rated Output Capacity*2 kW	5	10	20	30	50	65	90	130	5	10	20	30	40	60	100	130	185	270	370	630
	Rated Output Current(DC) A	15	30	61	91	152	197	273	394	8	15	30	45	61	91	152	197	280	409	561	955
	Rated Input Current(AC) A	15	29	57	83	140	200	270	400	8	16	30	43	58	86	145	210	300	410	560	1040
	Rated Output Voltage	330 Vdc							660 Vdc												
Input	Rated Voltage/Rated Frequency	200 to 240 Vac 50/60 Hz							380 to 480 Vac 50/60 Hz												
	Allowable Voltage Fluctuation	-15 to +10%																			
	Allowable Frequency Fluctuation	±2%																			
Control Characteristics	Control Method	Sine-wave PWM control																			
	Input Power Factor	Input power factor of 0.99 min. (for rated operation)																			
	Output Voltage Accuracy	±5%																			
	Overload Protection	Unit stops after 60 s at 150% of rated output current or after 3 s at 200% of rated output current.																			
	Voltage Reference Range	300 to 360 Vdc							600 to 730 Vdc												
	Carrier Frequency	6 kHz			4 kHz				6 kHz			4 kHz				2 kHz					
Main Control Functions	Current Limit, Cooling Fan on/off Switch, Removable Terminal Block with Parameter Backup Function, MEMOBUS/Modbus Comm. (RS-422/RS-485 max, 115.2 kbps)																				
Protection Functions	Momentary Overcurrent Protection	Unit stops when input current exceeds 250%.																			
	Fuse burnout	Operation stops if the fuse burns out.																			
	Overloads	Operation stops after 60 s at 150% of rated output current.																			
		Operation stops after 3 s at 200% of rated output current. (electrical operation and regeneration)																			
	Overvoltage Protection	Output	Stops when DC bus voltage exceeds approx. 410 Vdc							Stops when DC bus voltage exceeds approx. 820 Vdc											
		Input	Stops when input voltage exceeds approx. 227 Vac							Stops when input voltage exceeds approx. 554 Vac											
	Undervoltage Protection	Output	Stops when DC bus voltage falls below approx. 190 Vdc							Stops when DC bus voltage falls below approx. 380 Vdc											
		Input	Stops when input voltage falls below approx. 150 Vac							Stops when input voltage falls below approx. 300 Vac											
	Momentary Power Loss	Immediately stops after Momentary Power Loss is detected.																			
	Power Supply Frequency Fault	Operation stops for a deviation of ± 6 Hz or more from the rated input frequency.																			
	Heatsink Overheat Protection	Protection by thermistor																			
Ground Fault Protection*3	Protection by electronic circuit																				
Charge LED	Charge LED remains lit until DC bus has fallen below approx. 50 V																				
Environment	Area of Use	Indoors																			
	Ambient Temperature	-10 to +50° C (IP00/IP20/Open Type enclosure)																			
	Humidity	95% RH or less (no condensation)																			
	Shock	(2A0005 to 2A0050, 4A0005 to 4A0100) 10 to 20 Hz : 9.8 m/s <sup>2</sup> , 20 to 55 Hz : 5.9 m/s <sup>2</sup>																			
		(2A0065 to 2A0130, 4A0130 to 4A0370) 10 to 20 Hz : 9.8 m/s <sup>2</sup> , 20 to 55 Hz : 2.0 m/s <sup>2</sup>																			
		(4A0630) 10 to 20 Hz : 5.9 m/s <sup>2</sup> , 20 to 55 Hz : 2.0 m/s <sup>2</sup>																			
Storage Temperature	-20 to +60° C (short-term temperature during transportation)																				
Altitude	Up to 1000 meters (derating required at altitudes from 1000 m to 3000 m)																				
Protection Design	IP00/IP20/Open Type enclosure																				
Safety Standard	UL508C, IEC61800-5-1, IEC61800-3																				

\*1 : This number indicates the voltage class (2: 200 V class, 4: 400 V class).

\*2 : For the 200 V class, rated output capacity is calculated with a rated output voltage of 220 V. For the 400 V class, values are given for an input voltage of 440 V.

\*3 : Protection may not be provided under the following conditions as the motor windings are grounded internally during run:

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

Note: You must install a harmonic filter module and input AC reactor 1 for a D1000 of 5 to 185 kW.

You must install a reactor for the harmonic filter, a capacitor for the harmonic filter, and input AC reactors 1 and 2 for a D1000 of 270 to 630 kW.

### D1000 Standard Configuration Devices

Voltage		200 V							400 V												
Model CIMR-DA*1A		0005	0010	0020	0030	0050	0065	0090	0130	0005	0010	0020	0030	0040	0060	0100	0130	0185	0270	0370	0630
Harmonic Filter Module	Rated Current A	15	29	57	83	140	200	270	400	8	16	30	43	58	86	145	210	300	—	—	—
	Rated Current A	15	29	57	83	140	200	270	400	8	16	30	43	58	86	145	210	300	410	560	560
Input AC Reactor 1	Inductance mH	2.45	1.27	0.64	0.44	0.26	0.18	0.14	0.09	9.19	4.59	2.45	1.71	1.27	0.85	0.51	0.35	0.25	0.18	0.13	0.13
	Rated Current A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	410	560	1140
Input AC Reactor 2	Inductance mH	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.05	0.02
	Rated Current A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	64	87	177
Reactor for Harmonic Filter	Inductance mH	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.022	0.0158	0.0079
	Rated Capacity μF	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	290	402	800

\* : This number indicates the voltage class (2: 200 V class, 4: 400 V class).

Note: CIMR-DA 4A0630 requires two units of input AC reactor 1.



Energy-Saving Unit

# Power Regenerative Unit R1000

## R1000 Energy-saving Unit

Catalog No. KAJP C7106560

Voltage		200 V Class											400 V Class																
Model CIMR-RA <sup>①</sup> A <sup>②</sup> .....		03P5	0005	0007	0010	0014	0017	0020	0028	0035	0053	0073	0105	03P5	0005	0007	0010	0014	0017	0020	0028	0035	0043	0053	0073	0105	0150	0210	0300
Max. Applicable Motor Capacity kW		3.7	5.5	7.5	11	15	18.5	22	30	37	55	75	110	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	110	160	220	315
Rating	Regeneration Capacity kW	3.5	5	7	10	14	17	20	28	35	53	73	105	3.5	5	7	10	14	17	20	28	35	43	53	73	105	150	210	300
	Rated Output Current (DC) A	14	20	27	41	55	68	81	112	138	207	282	413	7	11	15	22	30	36	43	58	73	89	109	149	217	320	440	629
	Rated Input Current (AC) A	10	15	20	30	41	50	60	83	102	153	209	306	5	8	11	16	22	27	32	43	54	66	81	110	161	237	326	466
Input	Rated Voltage/Rated Frequency	200 to 240Vac 50/60Hz											380 to 480Vac 50/60Hz																
	Allowable Voltage Fluctuation	- 15 to + 10%																											
	Allowable Frequency Fluctuation	±2%																											
Control Characteristics	Control Method	120° excitation method																											
	Input Power Factor	0.9 min. (for rated load)																											
	Overload Protection	30 s at approx. 150% of rated current.																											
	Regenerative Torque	150% 30 s, 100% 25% ED 60 s, 80% continuous																											
	Main Control Functions	Cooling Fan on/off Switch, MEMOBUS/Modbus Comm. (RS-422/RS-485 max, 115.2 kbps)																											
	Momentary Overcurrent Protection	Operation stops for approx. 250% or higher of the rated power supply current.																											
Protection Functions	Fuse burnout	Operation stops if the fuse burns out.																											
	Overloads	Operation stops for 150% of the rated power supply current for 30 s.																											
	Overvoltage Protection	Output	Stops when DC bus voltage exceeds approx. 410 Vdc											Stops when DC bus voltage exceeds approx. 820 Vdc															
		Input	Stops when input voltage exceeds approx. 227 Vac											Stops when input voltage exceeds approx. 554 Vac															
	Undervoltage Protection	Output	Stops when DC bus voltage falls below approx. 190 Vdc											Stops when DC bus voltage falls below approx. 380 Vdc															
		Input	Stops when input voltage falls below approx. 150 Vac											Stops when input voltage falls below approx. 300 Vac															
	Momentary Power Loss	Immediately stops after Momentary Power Loss is detected.																											
	Power Supply Frequency Fault	Operation stops for a deviation of ±6 Hz or more from the rated input frequency.																											
	Heatsink Overheat Protection	Protection by thermistor																											
	Ground Fault Protection <sup>*2</sup>	Protection by electronic circuit																											
Charge LED	Charge LED remains lit until DC bus has fallen below approx. 50 V																												
Environment	Area of Use	Indoors																											
	Ambient Temperature	-10 to +40° C [Enclosed Wall-Mounted (NEMA Type1)], -10 to +50° C [Open Type enclosure (IP00)]																											
	Humidity	95% RH or less (no condensation)																											
	Shock	(2A03P5 to 2A0053, 4A03P5 to 4A0073)10 to 20 Hz : 9.8 m/s <sup>2</sup> , 20 to 55 Hz : 5.9 m/s <sup>2</sup>																											
		(2A0073 to 2A0105, 4A0105 to 4A0300)10 to 20 Hz : 9.8 m/s <sup>2</sup> , 20 to 55 Hz : 2.0 m/s <sup>2</sup>																											
	Storage Temperature	-20 to +60° C (short-term temperature during transportation)																											
	Altitude	Up to 1000 meters (derating required at altitudes from 1000 to 3000 m)																											
Protection Design	Open Type enclosure (IP00) Enclosed Wall-Mounted (NEMA Type1 (IP20)) <sup>*4</sup>																												
Safety Standard <sup>*3</sup>	UL508C, IEC/EN61800-5-1, IEC/EN61800-3																												

\*1 : This number indicates the voltage class (2: 200 V class, 4: 400 V class).

\*2 : Protection may not be provided under the following conditions as the motor windings are grounded internally during run:

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

\*3 : Application pending.

\*4 : IP20 protection applies if the top cover is removed from a NEMA Type1 Unit (CIMR-RA2A03P5 to CIMR-RA2A0028 or CIMR-RA4A03P5 to CIMR-RA4A0028).

### R1000 Standard Configuration Devices

Voltage		200 V Class											400 V Class																
Model CIMR-RA <sup>①</sup> A <sup>②</sup> .....		03P5	0005	0007	0010	0014	0017	0020	0028	0035	0053	0073	0105	03P5	0005	0007	0010	0014	0017	0020	0028	0035	0043	0053	0073	0105	0150	0210	0300
Power Coordinating Reactor	Rated Current A	20	30	40	60	80	90	120	160	200	280	360	500	10	15	20	30	40	50	60	80	90	120	150	200	250	330	490	660
	Inductance mH	0.53	0.35	0.265	0.18	0.13	0.12	0.09	0.07	0.05	0.038	0.026	0.02	2.2	1.42	1.06	0.7	0.53	0.42	0.36	0.26	0.24	0.18	0.15	0.11	0.09	0.06	0.04	0.03
Current Suppression Reactor	Rated Current A	15	15	20	40	40	50	60	80	100	153	209	306	7.5	7.5	10	15	25	25	30	40	50	60	75	100	161	237	326	466
	Inductance mH	0.31	0.31	0.15	0.1	0.1	0.06	0.05	0.04	0.03	0.02	0.015	0.01	1.2	1.2	0.6	0.4	0.3	0.3	0.2	0.15	0.12	0.1	0.08	0.06	0.04	0.03	0.02	0.013
Fuse	Rated Current A	20	25	32	50	63	80	100	125	160	200	350	500	16	16	16	25	40	40	50	63	80	100	125	160	250	350	500	630

\* : This number indicates the voltage class (2: 200 V class, 4: 400 V class).

## Low-voltage Inverter Drive for Systems FSDrive-LV1HM (Drawer type, 400 V Class) Catalog No. KAEP C710691 00

Model	CIMR-LV1HMD□4□□□□	0P4	0P7	1P5	2P2	3P0	3P7	5P5	7P5	011	015	018	022	030	037	045	
Max. Applicable Motor Capacity*1	kW	0.4	0.75	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22	30	37	45	
Rated Input Current*2	A	1.8	3.2	4.4	6	8.2	10.4	15	20	29	39	44	43	58	71	86	
Rated Input Voltage		510 VDC to 720 VDC															
Output	Rated Output Capacity*3	kVA	1.4	2.6	3.7	4.2	5.5	7	11.3	13.7	18.3	24	30	34	46	57	69
	Rated Output Current*4	A	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18	24	31	39	45	60	75	91
	Overload Tolerance		150% of rated output current for 60 s														
	Max. Output Voltage		Three-phase 380 V to 480 V (relative to input voltage)														
	Max. Output Frequency		400 Hz (user-set)														
Control Characteristics	Control Method		V/f Control, V/f Control with PG, Open Loop Vector Control, Closed Loop Vector Control, EMS Control, Open Loop Vector Control for PM, and Closed Loop Vector Control for PM														
	Frequency Control Range		0.01 Hz to 400 Hz														
	Frequency Accuracy (Temperature Fluctuation)		Digital reference : within ±0.01% of the max. output frequency (-10°C to +40°C) Analog reference: within ±0.1% of the max. output frequency (25°C±10°C)														
	Frequency Setting Resolution		Digital reference: 0.01 Hz Analog reference: 0.03 Hz/60 Hz (11 bit)														
	Output Frequency Resolution		0.001 Hz														
	Speed Control Range		1:1500 (Closed Loop Vector Control and Closed Loop Vector Control for PM) 1:200 (Open Loop Vector Control) 1:40 (V/f Control and V/f Control with PG) 1:20 (Open Loop Vector Control for PM) 1:100 (Advanced Open Loop Vector Control for PM)														
	Speed Control Accuracy		±0.2% in Open Loop Vector Control (25°C±10°C), 0.01% in Closed Loop Vector Control (25°C±10°C)														
	Speed Response		10 Hz in Open Loop Vector Control (25°C±10°C), 50 Hz in Closed Loop Vector Control (25°C±10°C) (excludes temperature fluctuation when performing rotational autotuning)														
	Accel/Decel Time		0.00 s to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)														
	Main Control Functions		Torque control, droop control, speed/torque control switch, feed forward control, load torque observer control, momentary power loss ride-thru, speed search, overtorque detection, torque limit, autotuning, dwell, slip compensation, torque compensation, energy saving control, etc.														

\*1: The motor capacity (kW) refers to a Yaskawa 4-pole, 60 Hz, 400 V motor.

The rated output current of the inverter output amps should be equal to or greater than the motor rated current.

\*2: Value displayed is for operating at the rated output current. This value may fluctuate based on power supply side impedance, as well as the power supply transformer, input side reactor, and wiring.

\*3: Rated output capacity is calculated with a rated output voltage of 440 VAC.

\*4: Carrier frequency is set to 2 kHz.

Note: For details on 200 V class drives, refer to the catalog for Low-Voltage AC Drive for Systems FSDrive-LV1H Series (catalog no. KAEP C71069100).

## Low-voltage Inverter Drive for Systems FSDrive-LV1HF (Fixed type) Catalog No. KAEP C710691 00

Model	CIMR-LV1HFD□4□□□□	055	075	090	110	132	160	185	
Max. Applicable Motor Capacity*1	kW	55	75	90	110	132	160	185	
Rated Input Current*2	A	105	142	170	207	248	300	346	
Rated Input Voltage		510 VDC to 720 VDC							
Output	Rated Output Capacity*3	kVA	85	114	137	165	198	232	282
	Rated Output Current*4	A	112	150	180	216	260	304	370
	Overload Tolerance		150% of rated output current for 60 s						
	Max. Output Voltage		Three-phase 380 V to 480 V (relative to input voltage)						
	Max. Output Frequency		400 Hz (user-set)						
Control Characteristics	Control Method		V/f Control, V/f Control with PG, Open Loop Vector Control, Closed Loop Vector Control, EMS Control, Open Loop Vector Control for PM, and Closed Loop Vector Control for PM						
	Frequency Control Range		0.01 Hz to 400 Hz, 55 kW to 160 kW: 0.01 Hz to 150 Hz, 185 kW						
	Frequency Accuracy (Temperature Fluctuation)		Digital reference : within ±0.01% of the max. output frequency (-10°C to +40°C) Analog reference: within ±0.1% of the max. output frequency (25°C±10°C)						
	Frequency Setting Resolution		Digital reference : 0.01 Hz Analog reference: 0.03 Hz/60 Hz (11 bit)						
	Output Frequency Resolution		0.001 Hz						
	Speed Control Range		1:1500 (Closed Loop Vector Control and Closed Loop Vector Control for PM) 1:200 (Open Loop Vector Control) 1:40 (V/f Control and V/f Control with PG) 1:20 (Open Loop Vector Control for PM) 1:100 (Advanced Open Loop Vector Control for PM)						
	Speed Control Accuracy		±0.2% in Open Loop Vector Control (25°C±10°C), 0.01% in Closed Loop Vector Control (25°C±10°C)						
	Speed Response		10 Hz in Open Loop Vector Control (25°C±10°C), 50 Hz in Closed Loop Vector Control (25°C±10°C) (excludes temperature fluctuation when performing rotational autotuning)						
	Accel/Decel Time		0.00 s to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)						
	Main Control Functions		Torque control, droop control, speed/torque control switch, feed forward control, load torque observer control, momentary power loss ride-thru, speed search, overtorque detection, torque limit, autotuning, dwell, slip compensation, torque compensation, energy saving control, etc.						

\*1: The motor capacity (kW) refers to a Yaskawa 4-pole, 60 Hz, 400 V motor.

The rated output current of the inverter output amps should be equal to or greater than the motor rated current.

\*2: Value displayed is for operating at the rated output current. This value may fluctuate based on power supply side impedance, as well as the power supply transformer, input side reactor, and wiring.

\*3: Rated output capacity is calculated with a rated output voltage of 440 VAC.

\*4: Carrier frequency is set to 2 kHz.

Low-voltage Inverter Drive for Systems **FSDrive-LV1HS** (Slim type)

Catalog No. KAEP C710691 00

Model	CIMR-LV1HSR□4□□□ (400 V)					CIMR-LV1HSR□6□□□ (690 V)					
	200	400	600	800	10C	350	700	10C	14C	17C	
Max. Applicable Motor Capacity*1 kW	200	400	600	800	1000	350	700	1050	1400	1750	
Rated Input Current*2 A	373	739	1104	1467	1830	410	814	1216	1618	2019	
Rated Input Voltage	510 VDC to 720 VDC					810 VDC to 1040 VDC					
Output	Rated Output Capacity*3 kVA	320	610	920	1220	1530	440	840	1260	1680	2100
	Rated Output Current*4 A	414	800	1200	1600	2000	360	700	1050	1400	1750
	Overload Tolerance	150% of rated output current for 60 s									
	Career Frequency	2 kHz									
	Max. Output Voltage*5	Three-phase 380 V to 480 V (relative to input voltage)					Three-phase 600 V to 690 V (proportional to input voltage)				
	Max. Output Frequency	150 Hz									
Control Characteristics	Control Method	V/f Control, V/f Control with PG, Open Loop Vector Control, Closed Loop Vector Control, EMS Control									
	Frequency Control Range	0.01 Hz to 150 Hz									
	Frequency Accuracy (Temperature Fluctuation)	Digital reference : within ±0.01% of the max. output frequency (–10°C to +40°C) Analog reference : within ±0.1% of the max. output frequency (25°C±10°C)									
	Frequency Setting Resolution	Digital reference : 0.01 Hz Analog reference: 0.03 Hz/60 Hz (11 bit)									
	Output Frequency Resolution	0.001 Hz									
	Starting Torque	150%/3 Hz (V/f Control) 150%/3 Hz (V/f Control with PG) 200%/0.3 Hz (Open Loop Vector Control) 200%/0 min <sup>-1</sup> (Closed Loop Vector Control)									
	Speed Control Range	1:40 (V/f Control) 1:40 (V/f Control with PG) 1:200 (Open Loop Vector Control) 1:1500 (Closed Loop Vector Control)									
	Speed Control Accuracy	±0.2% in Open Loop Vector Control (25°C±10°C), 0.01% in Closed Loop Vector Control (25°C±10°C)									
	Speed Response	5 Hz (25±10°C) (Open Loop Vector Control)									
	Accel/Decel Time	0.00 s to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)									
	Voltage/Frequency Characteristics	User-selected programs and V/f preset patterns possible									
	Main Control Functions	Torque control, droop control, speed/torque control switch, feed forward control, load torque observer control, momentary power loss ride-thru, speed search, overtorque detection, torque limit, autotuning, dwell, slip compensation, torque compensation, energy saving control, etc.									

\*1: The rated output current of the inverter drive output amps should be equal to or greater than the motor rated current.

\*2: Value displayed is for operating at the rated output current. This value may fluctuate based on power supply side impedance, as well as the power supply transformer, input side reactor, and wiring.

\*3: The rated output capacity is calculated with a rated output voltage of 440 VAC or 690 VAC.

\*4: Carrier frequency is set to 2 kHz.

\*5: Varies by the type of input power supply and inverter drive capacity.

Low-voltage Converter for Systems **FSDrive-LC1HS** (Slim type)

Catalog No. KAEP C710691 00

Model	CIMR-LC1HSR□4□□□ (400 V)					CIMR-LC1HSRA6□□□ (690 V)					
	200	400	600	800	10C	350	700	10C	14C	17C	
Max. Applicable Inverter Drive Capacity kW	200	400	600	800	1000	350	700	1050	1400	1750	
Rated Input Current A	414	800	1200	1600	2000	360	700	1050	1400	1750	
Output	Rated Output Capacity kW	250	500	750	1000	1250	380	760	1140	1520	1900
	Rated Output Current A	380	760	1140	1520	1900	370	740	1110	1480	1850
	Rated Output Voltage	660 VDC					1020 VDC				
	Overload Tolerance	150% of rated input current for 60 s									
	Career Frequency	2 kHz									
Power Supply	Max. Output Voltage	720 VDC					1040 VDC				
	Rated Voltage and Rated Frequency	Three-phase 380 VAC to 480 VAC, 50/60 Hz					Three-phase 600 VAC to 690 VAC, 50/60 Hz				
	Allowable Voltage Fluctuation	–15% ~ +10%									
	Allowable Frequency Fluctuation	±3%/300 ms (free phase rotation)									
Power Supply Equipment Capacity kVA	Power supply capacity greater than the rated input capacity										
Control Characteristics	Control Method	Sine Wave PWM*									
	Input Power Factor	0.99 min. (at rated current)									
	Output Voltage Accuracy	±5%									

\* The FSDrive-LC1HS conforms to the conditions for self-excited three-phase bridges (K5 = 0) outlined by the "Japanese Guidelines for Reduction of Harmonic Emission" published by the Ministry of Economy, Trade and Industry in Japan. These bridges generate no harmonics, but the harmonics are not completely eliminated.

# Super Energy-saving Medium-voltage AC Drive FSDrive-MV1000

Catalog No. KAEP C710687 02

3 kV Class		Model CIMR-MV2AC*CA□□□□	035	050	070	100	140	200	260	330	400	520	650	
3 kV Class	Nominal Capacity	kVA	200	285	400	570	800	1150	1500	1900	2300	3000	3700	
	Max. Applicable Motor Capacity	kW	132	200	315	450	630	900	1250	1500	1800	2500	3000	
	Output Rating	Rated Output Current	A	35	50	70	100	140	200	260	330	400	520	650
		Rated Output Voltage	V	Three-phase, 3000/3300 V (sinusoidal wave, proportional to input voltage)										
Power Supply	Main Circuit		Three-phase, 3000 V (50 Hz ± 5%) or 3300 V (50/60 Hz ± 5%) –20% to +10%											
6 kV Class		Model CIMR-MV2AF*FA□□□□	035	050	070	100	140	200	260	330	400	520	650	
6 kV Class	Nominal Capacity	kVA	400	570	800	1150	1600	2300	3000	3800	4600	6000	7500	
	Max. Applicable Motor Capacity	kW	250	400	630	900	1250	1800	2500	3000	3600	5000	6000	
	Output Rating	Rated Output Current*	A	35	50	70	100	140	200	260	330	400	520	650
		Rated Output Voltage	V	Three-phase, 6000/6600 V (sinusoidal wave, proportional to input voltage)										
Power Supply	Main Circuit		Three-phase, 6000 V (50 Hz ± 5%) or 6600 V (50/60 Hz ± 5%) –20% to +10%											
11 kV Class		Model CIMR-MV2AH*HA□□□□	035	050	070	100	140	200	260	330	400	520	650	
11 kV Class	Nominal Capacity	kVA	660	950	1300	1900	2650	3800	5000	6200	7600	9900	12000	
	Max. Applicable Motor Capacity	kW	530	760	1070	1520	2130	3050	3960	5030	6100	7930	9910	
	Output Rating	Rated Output Current	A	35	50	70	100	140	200	260	330	400	520	650
		Rated Output Voltage	V	Three-phase, 10000 V, 10500 V or 11000 V (sinusoidal wave, proportional to input voltage)										
Power Supply	Main Circuit		Three-phase, 10000 V, 10500 V or 11000 V (50/60 Hz ± 5%) –20% to +10%											
Common Specifications	Efficiency		Approx. 97% (At rated motor speed, 100% load)											
	Power Factor		Min. 0.95 (At motor rated speed, 100% load)											
	Cooling Method		Forced air-cooling by fan (with failure detection)											
	Control Specifications	Control Method		Open-loop vector control, Closed loop vector control, V/f control (for multiple motor operation), Closed loop control for SM (option)										
Main Circuit			Voltage-type PWM control with multiple outputs connected in series (power cell: 3-level output)											

\*: Derating may be required for products that meet NK certification to maintain an ambient temperature of 45°C.

Contact your Yaskawa representative for details.

Notes 1: Contact your Yaskawa representative for 2 kV, 4 kV class models.

2: Asterisk indicates input frequency (5: 50 Hz, 6: 60 Hz).

# Super Energy-saving Medium-voltage Matrix Inverter 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	1800	2500	250	400	630	900	1250	1800	2500	3600	5000	
Output Rating	Nominal Capacity	kVA	200	285	400	570	800	1150	1500	2300	3000	400	570	800	1150	1600	2300	3000	4600	6000
	Rated Output Current	100% Continuous	35	50	70	100	140	200	260	400	520	35	50	70	100	140	200	260	400	520
		Rated Voltage		Three-phase, 3/3.3 kV (sine wave)									Three-phase, 6/6.6 kV (sine wave)							
	Rated Frequency		50/60 Hz																	
Power	Main Circuit (Input Voltage)*2		Three-phase, 3/3.3 kV ±10%, 50/60 Hz ±5%									Three-phase, 6/6.6 kV ±10%, 50/60 Hz ±5%								
	Control Circuit		Three-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)*4																		
	Analog Input Resolution	0.03 Hz																		
	Accel/Decel Time	0.1 to 6000 s																		
Main Control Functions	Momentary power loss ride-thru*3, Torque limit, Accel stall prevention, Catching the coast, Operation prohibition at specified speeds, S-curve accel/decel, Multi-step speed operation, Torque control*4																			
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: The capacity (kVA) of the power supply must be larger than the nominal capacity (kVA) of the matrix converter. The maximum percent impedance of the power supply is 5%.

Insufficient capacity of the power supply or distortions of voltage waveforms may cause problems. If you need to connect the matrix converter to a generator or to a thyristor that is connected to the same power supply system as the matrix converter, contact your Yaskawa representative for more information.

\*3: When the restart function for the momentary power loss is used, an uninterruptive power supply unit for the control power supply is needed optionally.

\*4: 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).

# Yaskawa AC Drive Series Discontinued Products and Recommended Replacements












Series Name	Release Date	Discontinuation Date	Recommended Replacements	Remarks
VS-616HII	1985. 9	1995. 6	A1000, Varispeed G7	
VS-676	1986. 6	1995. 6	Varispeed G7	
VS-616GII	1987. 5	1992. 9	A1000, Varispeed G7	
Juspeed-F S <sub>2</sub>	1988	1995. 9	V1000, J1000	
VS-616GII LN	1988. 5	1992. 9	A1000, Varispeed G7	
VS-866 (including converter unit)	1988.10	2002. 9	Large-capacity servo	
VS-616G3	1990. 3	1997. 9	A1000, Varispeed G7	
VS-676VG3	1990.10	2004. 9	Varispeed G7	
VS-676VH3	1990.10	2004. 6	Varispeed G7	
VS-616H3	1990.11	1998. 3	A1000, Varispeed G7	
VS-606PB3	1991. 9	2004. 9	V1000, J1000	
VS-626VM3	1992	2004. 9	Σ-V-SD analog interface type	Contact your Yaskawa representative for details.
VS-656DC3 (excluding 400 V 300 kW)	1992	2008. 3	D1000	Production of 400 V 300 kW was discontinued in July 2012.
VS-606PC3 (excluding NEMA4)	1992. 9	2000. 3	V1000, J1000	
VS-626VM3C	1993	2004. 9	Σ-V-SD analog interface type	Contact your Yaskawa representative for details.
Juspeed-F S300	1993	2004.10	V1000, J1000, A1000	
Juspeed-F P300	1993	2004.10	V1000, J1000, A1000	
VS-616R3	1993. 1	2005. 9	A1000+R1000, Varispeed G7+R1000	
VS-606PC3 (NEMA4)	1993. 8	2010. 3	V1000 (NEMA4X/IP66 type)	
VS mini C (excluding single-phase 100 V)	1994.11	2005. 9	V1000, J1000	Production of inverters for single-phase 100 V class was discontinued in September 2013.
Juspeed-F X3000	1995	2004.10	A1000 (with PG card)	
Juspoint III	1995	2004.10	AC servo (Σ series)	
VS-616G5	1995. 7	2005.12	A1000, Varispeed G7	
VS-616PC5/P5	1995. 7	2003. 9	A1000, V1000	
VS-686SS5	1997. 4	2010. 3	A1000	
VS-626M5/VS-656MR5	1997. 9	2011.12	Σ-V-SD analog interface type	Contact your Yaskawa representative for details.
VS-676GL5 (excluding CIMR-L5S□□□□ and L5H□□□□)	1997.10	2010. 9	L1000A, L1000S	Production of the CIMR-L5S and L5H was discontinued in November 2013.
VS-606V7	1998. 6	2010. 3	V1000	
VS-616G5 (large-capacity slim type)	1998. 9	2012. 9	A1000HHP	
VS mini J7	1998.10	2010. 3	J1000	
VS-656RC5	1999	2014. 9	R1000	
VS-626MC5	2000. 1	2013. 9	A1000 (dedicated software)	Contact your Yaskawa representative for details.
Varispeed F7 (excluding safety-enhanced explosion-proof model)	2000. 6	2010. 3	A1000, V1000	Production of explosion-proof models was discontinued in September 2012.
Varispeed MX/MRX	2001.10	2015. 3	Σ-V-SD analog interface type	Contact your Yaskawa representative for details.
VS-656DC5	2002	2014. 3	D1000	
Varispeed V7 for DeviceNet communications	2002. 7	2010. 9	V1000+Option Unit (SI-N3/V)	
Varispeed V7 for CC-Link communications	2003. 5	2010. 9	V1000+Option Unit (SI-C3/V)	
Varispeed F7S (excluding safety-enhanced explosion-proof model)	2003.10	2010. 3	A1000	Production of explosion-proof models was discontinued in September 2012.
Varispeed L7	2003.11	2012. 3	L1000A	
Varispeed V7 pico	2005. 7	2008. 3	V1000pico Drive	
VS-646HF5	2007. 6	2013. 3	A1000 high frequency software (2000 Hz or less)	
V1000pico drive (combined with a SMRA motor)	2010. 5	2015. 9	—	

The recommended replacement products listed above may display some differences from the discontinued products they replace in terms of functions, performance, and installation. Should you have any questions or concerns, please contact your Yaskawa representative. Yaskawa's product and technical information website (<https://www.e-mechatronics.com>).

# Yaskawa AC Drive Series Catalogs

The following documents can be viewed at the Yaskawa product and technical information website (e-mechatronics.com).

[ ] Document number appears in brackets. \* Documents not provided by e-mechatronics.com. If required, please contact your Yaskawa representative.

General-Purpose			
			
J1000 [KAEP C710606 24]	V1000 [KAEP C710606 08]	A1000 [KAEP C710616 22]	U1000 [KAEP C710636 02]
General-Purpose	Application Specific	Energy-Saving Unit	
			
Varispeed G7 [KAE-S616-60]	L1000A* [EZZ021066]	D1000 [KAEP C710656 03]	R1000 [KAEP C710656 05]
System			
			
FSDrive-LV1H [KAEP C710691 00]	FSDrive-MV1000 [KAEP C710687 02]	FSDrive-MX1S [KAEP C710688 00]	



For catalogs of Yaskawa products, visit our website at [www.e-mechatronics.com](http://www.e-mechatronics.com) and click on "AC Drives".

Click "AC Drives"



[www.e-mechatronics.com](http://www.e-mechatronics.com)



# Global Service Network



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North America	U.S.A.	Chicago (HQ) Los Angeles San Francisco New Jersey Boston Ohio North Carolina	① YASKAWA AMERICA INC.	Headquarters ☎ +1-847-887-7000 FAX +1-847-887-7310
	Mexico	Mexico City	② PILLAR MEXICANA. S.A. DE C.V.	☎ +52-555-660-5553 FAX +52-555-651-5573
South America	South America	São Paulo	③ YASKAWA ELÉTRICO DO BRASIL LTDA.	☎ +55-11-3585-1100 FAX +55-11-5581-8795
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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply. Specifications are subject to change without notice for ongoing product modifications and improvements.

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