

# YASKAWA

## YASKAWA AC Drive Compact Vector Control Drive **V1000**

NEMA4X/IP66

200 V CLASS, THREE-PHASE INPUT: 0.1 to 18.5 kW  
200 V CLASS, SINGLE-PHASE INPUT: 0.1 to 3.0 kW  
400 V CLASS, THREE-PHASE INPUT: 0.2 to 18.5 kW

*Protective model  
now available!*



Certified for  
ISO9001 and  
ISO14001



JQA-QMA14913



JQA-EM0202

Photo courtesy of  
MARUYASU KIKAI Co.,LTD.



UL, CE approval pending

## NEMA4X/IP66

# Total protection from water and dust

- The V1000 NEMA4X/IP66 is fully-enclosed, waterproof drive for installation anywhere. Protective exterior allows for spray-washing.
- Large key operator located on the exterior makes it easy to adjust drive settings without needing to open the enclosure.
- The V1000 NEMA4X/IP66 is one of Yaskawa's current vector control V1000 series drives, capable of running both induction motors and synchronous motors.
- Self-enclosed design eliminates the need for a separate protective panel.
- Option units are available for all major serial networks.

### Enclosure Standards

Standard	NEMA	IEC	Description
Degree of Protection	4X	IP66	<ul style="list-style-type: none"> <li>• Totally, protects against dust.</li> <li>• Water projected in powerful jets against the enclosure from any direction shall have no harmful effects.</li> </ul> Note : Cannot be submerged in water.

NEMA : National Electrical Manufacturers Association  
IEC : International Electrotechnical Commission

### Resistance to Chemicals and Solvents



- Hydrochloric acid (10% max.)
- Sulfuric acid (10% max.)
- Nitric acid (10% max.)
- Ammonia water
- Sodium chloride



- Methanol
- Ethanol
- Silicon oils
- Glycol oil
- Vegetable oil
- Mineral oil
- Soybean oil

Note: 1. Contact Yaskawa for details on the tolerances to other chemicals and solvents.

2. Do not allow a constant stream of chemicals or solvents to be sprayed directly onto the drive, as this may damage the drive.

3. Refer to the NEMA4X/IP66 Installation Manual (TOBP C710606 35) for details.

### Major Applications



Conveyors



Food processing



Printing



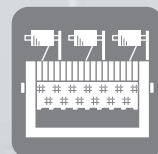
Woodworking



Tea leaf curing



Metalworking



Textiles

# Standard Specifications

## 200 V Class (Three-Phase/Single-Phase)

Note: Refer to the V1000 Catalog (KAEP C710606 08) for details.

Model	Three-Phase CIMR-VA2A: GA	0001	0002	0004	0006	0008*1	0010	0012	0018*1	0020	0030	0040	0056	0069
	Single-Phase CIMR-VABA: GA	0001	0002	0003	0006	—	0010	0012	—	—	—	—	—	—
Normal Duty	Max. Applicable Motor kW	0.2	0.4	0.75	1.1	1.5	2.2	3.0	3.7	5.5	7.5	11.0	15.0	18.5
	Rated Output Current A	1.2	1.9	3.5 (3.3)*2	6.0	8.0	9.6	12.0	17.5	19.6	30.0	40.0	56.0	69.0
Heavy Duty	Max. Applicable Motor kW	0.1	0.2	0.4	0.75	1.1	1.5	2.2	3.0	3.7	5.5	7.5	11.0	15.0
	Rated Output Current A	0.8	1.6	3.0	5.0	6.9	8.0	11.0	14.0	17.5	25.0	33.0	47.0	60.0
Rated Voltage/Rated Frequency		Three-phase power supply: Three-phase 200 to 240 V 50/60 Hz Single-phase power supply: Three-phase 200 to 240 V 50/60 Hz												

\*1: CIMR-V□2A0008 and 0020 are available in Japan only.

\*2: The value in the parenthesis applies to the single-phase drive.

## 400 V Class (Three-Phase)

Model	CIMR-VA4A: GA	0001	0002	0004	0005	0007	0009	0011	0018	0023	0031	0038
Normal Duty	Max. Applicable Motor kW	0.4	0.75	1.5	2.2	3.0	3.7	5.5	7.5	11.0	15.0	18.5
	Rated Output Current A	1.2	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23.0	31.0	38.0
Heavy Duty	Max. Applicable Motor kW	0.2	0.4	0.75	1.5	2.2	3.0	3.7	5.5	7.5	11.0	15.0
	Rated Output Current A	1.2	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24.0	31.0
Rated Voltage/Rated Frequency		Three-Phase 380 to 480 V 50/60 Hz										

## Common Specifications

Item	Specifications
Overload Tolerance	Normal Duty Rating: 120% of rated output current for 60 s. Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads)
Control Method	Open Loop Vector Control (Current Vector), V/f Control, Advanced Open Loop Vector Control for PM
Frequency Control Range	0.01 to 400 Hz
Frequency Accuracy (Temperature Fluctuation)	Digital input: within ±0.01% of the max. output frequency (–10 to +50°C) Analog input: within ±0.1% of the max. output frequency (25°C±10°C)
Frequency Setting Resolution	Digital input: 0.01 Hz, Analog input: 1/1000 if max. frequency 1/1000
Output Frequency Resolution	20 bit of maximum output frequency (parameter E1-04 setting)
Frequency Setting Signal	Main frequency reference: 0 to +10 Vdc (20 kΩ), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) Main speed reference: Pulse train input (max. 33 Hz)
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 (using Advanced Open Loop Vector Control for PM)
Speed Control Range	1:100 (Open Loop Vector Control), 1:20 to 40 (V/f Control), 1:10 (Advanced Open Loop Vector Control for PM)
Speed Control Accuracy	±0.2% in Open Loop Vector Control (25°C±10°C)
Speed Response	5 Hz in Open Loop Vector (25°C±10°C) (excludes temperature fluctuation when performing Rotational Auto-Tuning)
Torque Limit	Open Loop Vector Control allows separate settings in four quadrants
Accel/Decel Time	0.0 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)
Braking Torque	· Short-time decel torque: over 150% for 0.1/0.2 kW motors, over 100% for 0.4/0.75 kW motors, over 50% for 1.5 kW motors, and over 20% for 2.2 kW and above motors (overexcitation braking/High Slip Braking: approx. 40%) · Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option: 10% ED, 10 s, internal braking transistor)
V/f Characteristics	User-selected programs, V/f preset patterns possible
Main Control Functions	Momentary power loss ride-thru, Speed search, Overtorque detection, Torque limit, 17-step speed (max), Accel/dec time switch, S-curve accel/dec, 3-wire sequence, Auto-tuning, 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, Energy saving control, MEMOBUS comm. (RS-485/422 max, 115.2 kbps), Fault restart, Application presets, DriveWorksEZ (customization function), Removable terminal block with parameter backup function, Safe Disable inputs...

## Installation Area

Environment	Condition
Area of Use	Indoors
Ambient Temperature	–10 to +40°C Note: To ensure reliability, avoid using the V1000 NEMA4X/IP66 in areas with sudden, drastic temperature changes
Storage Temperature	–20 to +60°C Note: Shot-term temperature allowed during transportation
Surrounding Area	Install the drive to an area free of : · corrosive or flammable gas · radioactive materials · direct sunlight · combustible materials (e.g., wood) · harmful gases
Altitude	1000 m or lower
Shock	10 to less than 20 Hz (9.8 m/s <sup>2</sup> ) max., 20 to 55 Hz (5.9 m/s <sup>2</sup> ) max.

## Peripheral Devices and Options

Although the V1000 NEMA 4X/IP66 is compatible with all V1000 options and peripherals, those options may not be waterproof. The following options cannot be used because installation requires modification to the fully-enclosed design.

### Options Incompatible with V1000 NEMA4X/IP66

- 24 V Power Supply Model: PS-V10S, PS-V10M
- LCD Operator Model: JVOP-180
- LED Operator Model: JVOP-182

# Model Number Key

**CIMR-V A 2 A 0001 G A A**

Yaskawa AC Drive V1000 Series Design Revision Order

No.	Region Code	No.	Voltage Class	No.	Customize Specification	No.	Output Current A	No.	Protective Design	Environmental Specification
A	Japan	B	Single-phase 200 V	A	Standard	Note: Refer to the specification table for the standard model.		G	NEMA4X/IP66	
T	Asia	2	Three-phase 200 V							
		4	Three-phase 400 V							

# Dimensions (mm)

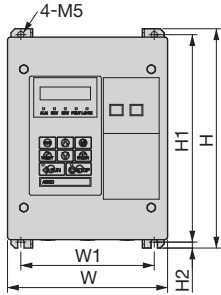


Figure 1

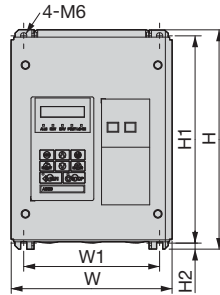


Figure 2

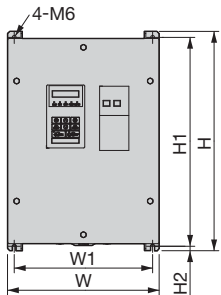


Figure 3

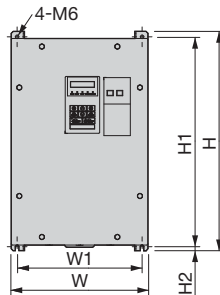


Figure 4

Voltage Class	Drive Model CIMR-VA	Figure	Dimensions (mm)							Weight (kg)	Cooling
			W	H	D	W1	H1	H2	t1		
200 V Class (Three-Phase)	2A0001GA	1	162	222	185	135	210	6	2	4.7	Self cooled
	2A0002GA									4.8	
	2A0004GA										
	2A0006GA										
	2A0008GA	2	187	255	235	158	241	7	2.5	7.7	Self cooled
	2A0010GA									8.1	
	2A0012GA										
	2A0018GA										
	2A0020GA	3	290	420	305	265	400	8.5	2.5	21.8	Fan cooled
	2A0040GA									23.2	
2A0056GA	27.7										
2A0069GA											
200 V Class (Single-Phase)	BA0001GA	1	162	222	185	135	210	6	2	4.7	Self cooled
	BA0002GA									4.9	
	BA0003GA										
	BA0006GA	2	187	255	235	158	241	7	2.5	7.8	Self cooled
	BA0010GA									8.2	
400 V Class (Three-Phase)	4A0001GA	1	162	222	185	135	210	6	2	5.0	Self cooled
	4A0002GA									5.1	
	4A0004GA									7.7	
	4A0005GA	2	187	255	235	158	241	7	2.5	7.9	Self cooled
	4A0007GA									8.1	
	4A0009GA										
	4A0011GA										
	4A0018GA	3	290	420	305	265	400	8.5	2.5	21.7	Fan cooled
	4A0023GA									21.8	
	4A0031GA									22.9	
4A0038GA	23.2										

# Recommended Parts

Installation requires some components sold separately. Recommended parts are listed below.

## Cable Glands [Seiwa Electric, MFG. Co. Ltd.]

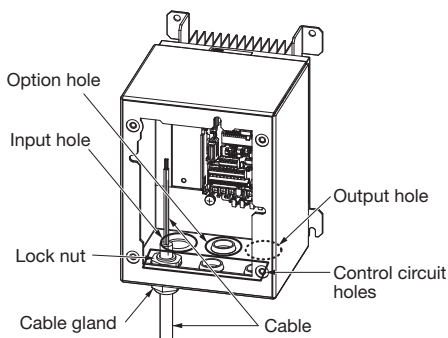
### Main Circuit Cable Glands

Voltage Class	Drive Model CIMR-VA	Drive Side Access Hole Diameter (mm)			Cable Glands			
		Input Hole (Number of holes: 1)	Output Hole (Number of holes: 1)	Option Hole (Number of holes: 1)	Wiring Diameter (mm)	Model		
200 V Class (Three-Phase)	2A0001GA	22	22	22	10.5 to 12.5	SCL-14A		
	2A0002GA							
	2A0004GA							
	2A0006GA							
	2A0008GA	28	28	28	10.6 to 12	SC-4A		
	2A0010GA				12.1 to 14	SC-4B		
	2A0012GA				14.1 to 16	SC-4C		
	2A0018GA				20.1 to 22	44	44	22
	2A0020GA	22.1 to 24.5	SC-6A					
	2A0030GA	30 to 32	SCL-38A					
	200 V Class (Single-Phase)	BA0001GA	22	22	22	10.5 to 12.5	SCL-14A	
BA0002GA								
BA0003GA		28	28	28	10.6 to 12	SC-4A		
BA0006GA					12.1 to 14	SC-4B		
BA0010GA					14.1 to 16	SC-4C		
400 V Class (Three-Phase)	4A0001GA	22	22	22	10.5 to 12.5	SCL-14A		
	4A0002GA							
	4A0004GA							
	4A0005GA	28	28	28	10.6 to 12	SC-4A		
	4A0007GA							
	4A0009GA							
	4A0011GA							
	4A0018GA	44	44	22	20.1 to 22	SC-6M		
	4A0023GA							
4A0031GA								
4A0038GA								

### Control Circuit Cable Glands

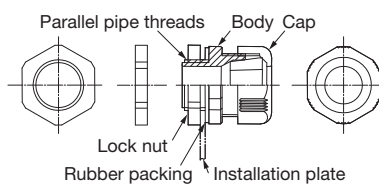
Voltage Class	Drive Side Access Holes		Cable Glands	
	Control Circuit Hole Diameter (mm)	Number of Holes	Wiring Diameter (mm)	Model
All Models	22	3	6.1 to 7.5	SC-3M
			7.6 to 9.0	SC-3A
			9.1 to 10.5	SC-3B
			10.5 to 12.5	SCL-14A
			12.5 to 14.5	SCL-14B

### Cable Gland Installation

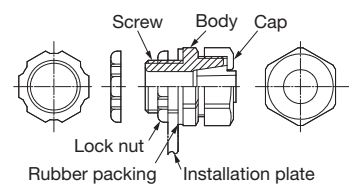


### Cable Gland Dimensions

· SCL-□□□ Series



· SC-□□ Series

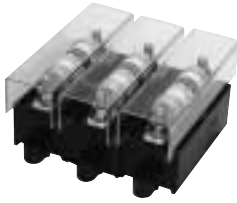


## Recommended Parts (Continued)

Installation requires some components sold separately. Recommended parts are listed below.

### Fuse/Fuse Holder

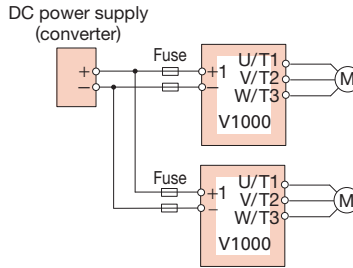
Install a fuse to the drive input terminals to prevent damage in case a fault occurs.  
Refer to the instruction manual for information on UL-approved components.



[Fuji Electric]

### Connection Diagram

DC Input Power Supply (example shows two V1000 drives connected in parallel.)  
Refer to the standard connection diagram in the V1000 Catalog (No. KAEP C710606 08) for use with AC power supply.



Note: When connecting multiple drives together, make sure that each drive has its own fuse. If any one fuse blows, all fuses should be replaced.

### Three-Phase 200 V Class

Model CIMR-VA2A	AC Power Supply / DC Power Supply							
	Fuse				Fuse Holder			
	Model	Code No.	Rated Short-Circuit Breaking Current (kA)	Qty.*	Model	Code No.	Qty.*	Figure
0001	CR6L-20/UL	FU002087	100	3	CMS-4	FU002091	3	1
0002	CR6L-20/UL	FU002087		3				
0004	CR6L-20/UL	FU002087		3				
0006	CR6L-30/UL	FU002088		3				
0008	CR6L-50/UL	FU000935		3				
0010	CR6L-50/UL	FU000935		3				
0012	CR6L-50/UL	FU000935		3				
0018	CR6L-75/UL	FU002089		3				
0020	CR6L-75/UL	FU002089		3				
0030	CR6L-100/UL	FU000927		3				
0040	CR6L-150/UL	FU000928		3				
0056	CR6L-150/UL	FU000928		3				
0069	CR6L-200/UL	FU000929	3	Note				

\*: Multiple fuses are needed when using an AC power supply.  
DC power requires only two fuses.

Note: Manufacturer does not recommend a specific fuse holder for this fuse.  
Contact the manufacturer for information on fuse dimensions.

### Three-Phase 200 V Class

Model CIMR-VA4A	AC Power Supply / DC Power Supply							
	Fuse				Fuse Holder			
	Model	Code No.	Rated Short-Circuit Breaking Current (kA)	Qty.*	Model	Code No.	Qty.*	Figure
0001	CR6L-20/UL	FU002087	100	3	CMS-4	FU002091	3	1
0002	CR6L-20/UL	FU002087		3				
0004	CR6L-50/UL	FU000935		3				
0005	CR6L-50/UL	FU000935		3				
0007	CR6L-50/UL	FU000935		3				
0009	CR6L-50/UL	FU000935		3				
0011	CR6L-50/UL	FU000935		3				
0018	CR6L-50/UL	FU000935		3				
0023	CR6L-75/UL	FU002089		3				
0031	CR6L-100/UL	FU000927		3				
0038	CR6L-150/UL	FU000928		3				
						CMS-5	FU002092	3

\*: Multiple fuses are needed when using an AC power supply.  
DC power requires only two fuses.

### Single-Phase 200 V Class

Model CIMR-VABA	AC Power Supply / DC Power Supply							
	Fuse				Fuse Holder			
	Model	Code No.	Rated Short-Circuit Breaking Current (kA)	Qty.*	Model	Code No.	Qty.*	Figure
0001	CR6L-20/UL	FU002087	100	2	CMS-4	FU002091	2	1
0002	CR6L-30/UL	FU002088		2				
0003	CR6L-50/UL	FU000935		2				
0006	CR6L-75/UL	FU002089		2				
0010	CR6L-100/UL	FU000927		2				
0012	CR6L-100/UL	FU000927		2				
0018	CR6L-150/UL	FU000928		2				
						CMS-5	FU002092	2

### Dimensions (mm)

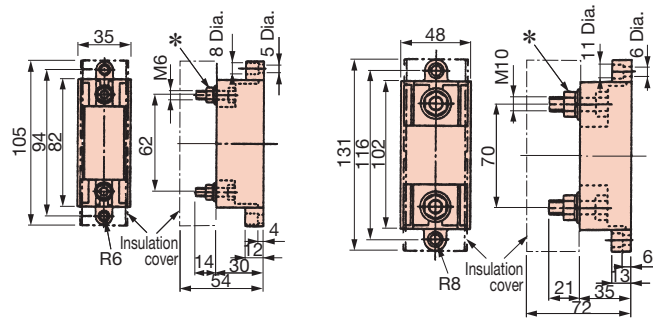


Figure 1

Figure 2

\*: Mounting components supplied separately.  
Tighten bolt when fuse is installed.



YASKAWA ELECTRIC CORPORATION

**DRIVE CENTER (INVERTER PLANT)**  
2-13-1, Nishimiyasichi, Yukuhashi, Fukuoka, 824-8511, Japan  
Phone 81-930-25-3844 Fax 81-930-25-4369

**YASKAWA ELECTRIC CORPORATION**  
New Pier Takeshiba South Tower, 1-16-1,  
Kaigan, Minatoku, Tokyo, 105-6891, Japan  
Phone 81-3-5402-4502 Fax 81-3-5402-4580

**YASKAWA AMERICA, INC.**  
2121, Norman Drive South, Waukegan, IL 60085, U.S.A.  
Phone 1-800-YASKAWA (927-5292) or 1-847-887-7000 Fax 1-847-887-7310

**YASKAWA ELÉTRICO DO BRASIL LTDA.**  
777, Avenida Piraporinha, Diadema, São Paulo, 09950-000, Brasil  
Phone 55-11-3585-1100 Fax 55-11-3585-1187

**YASKAWA EUROPE GmbH**  
185, Hauptstraße, Eschborn, 65760, Germany  
Phone 49-6196-569-300 Fax 49-6196-569-398

**YASKAWA ELECTRIC KOREA CORPORATION**  
9F, Kyobo Securities Bldg., 26-4, Yeouido-dong,  
Yeongdeungpo-gu, Seoul, 150-737, Korea  
Phone 82-2-784-7844 Fax 82-2-784-8495

**YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.**  
151, Lorong Chuan, #04-02A, New Tech Park 556741, Singapore  
Phone 65-6282-3003 Fax 65-6289-3003

**YASKAWA ELECTRIC (THAILAND) CO., LTD.**  
59, 1st-5th Floor, Flourish Building, Soi Ratchadapisek 18, Ratchadapisek Road,  
Huaykwang, Bangkok 10310, Thailand  
Phone: +66-2-017-0099 Fax: +66-2-017-0799

**PT. YASKAWA ELECTRIC INDONESIA**  
Secure Building-Gedung B Lantai Dasar & Lantai 1 Jl.  
Raya Protokol Halim Perdanakusuma, Jakarta 13610, Indonesia  
Phone 62-21-2982-6470 Fax 62-21-2982-6471

**YASKAWA ELECTRIC (CHINA) CO., LTD.**  
22F, One Corporate Avenue, No.222, Hubin Road, Shanghai, 200021, China  
Phone 86-21-5385-2200 Fax 86-21-5385-3299

**YASKAWA ELECTRIC (CHINA) CO., LTD. BEIJING OFFICE**  
Room 1011, Tower W3 Oriental Plaza, No.1 East Chang An Ave.,  
Dong Cheng District, Beijing, 100738, China  
Phone 86-10-8518-4086 Fax 86-10-8518-4082

**YASKAWA ELECTRIC TAIWAN CORPORATION**  
9F, 16, Nanking E. Rd., Sec. 3, Taipei, 104, Taiwan  
Phone 886-2-2502-5003 Fax 886-2-2505-1280

**YASKAWA INDIA PRIVATE LIMITED**  
#17/A, Electronics City, Hosur Road, Bangalore,  
560 100 (Karnataka), India  
Phone 91-80-4244-1900 Fax 91-80-4244-1901