

YASKAWA



Technical Data Sheet

AC Drive GA700

AC Drive for Industrial Applications

Catalog Code:
CIPR-GA70Cxxxxxxxx

400 V Class, Three-Phase Input: 0.55 to 630 kW
200 V Class, Three-Phase Input: 0.55 to 110 kW

yaskawa.eu



EN General Warning | **DE** Allgemeine Warnung |
FR Avertissement général | **IT** Avvertenza generale |
ES Advertencia general | **CS** Obecné varování |
PL Ostrzeżenie ogólne | **TR** Genel Uyarı |
RU Общее предупреждение | **JA** 一般的な警告 |
KO 일반 경고 | **ZH-CN** 一般警告 | **ZH-TW** 一般警告 |



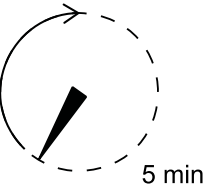
EN Electricity Hazard | **DE** Gefahr durch Elektrizität |
FR Risque d'électricité | **IT** Pericolo di elettricità |
ES Peligro por electricidad | **CS** Nebezpečí úrazu elektrickým proudem |
PL Niebezpieczeństwo związane z elektrycznością | **TR** Elektrik Tehlikesi |
RU Опасность поражения электричеством | **JA** 電気の危険 |
KO 감전 위험 | **ZH-CN** 电力危险 | **ZH-TW** 電力危險 |



EN Hot Surface | **DE** Heiße Oberfläche |
FR Surface chaude | **IT** Superficie calda |
ES Superficie caliente | **CS** Horký povrch |
PL Gorąca powierzchnia | **TR** Sıcak yüzey |
RU Горячая поверхность | **JA** 熱い表面 |
KO 뜨거운 표면 | **ZH-CN** 热表面 | **ZH-TW** 熱表面 |



EN Refer to Instruction Manual | **DE** Siehe Gebrauchsanweisung |
FR Consulter le manuel d'instructions | **IT** Fare riferimento alle istruzioni per l'uso |
ES Consulte el manual de instrucciones | **CS** Viz návod k použití |
PL Zapoznaj się z instrukcją obsługi | **TR** Kullanım Kılavuzuna bakın |
RU Обратитесь к руководству по эксплуатации | **JA** 取扱説明書参照 |
KO 사용 설명서 참조 | **ZH-CN** 请参阅使用说明书 | **ZH-TW** 請參閱使用說明書 |



EN Wait for 5 Minutes Before Proceeding | **DE** Warten Sie 5 Minuten, bevor Sie fortfahren |
FR Attendez 5 minutes avant de procéder | **IT** Attendere 5 minuti prima di procedere |
ES Espere 5 minutos antes de proceder | **CS** Před pokračáním vyčkejte 5 minut |
PL Przed przystąpieniem do pracy odczekaj 5 minut | **TR** Devam etmeden önce 5 dakika bekleyin |
RU Подождите 5 минут, прежде чем приступить к работе | **JA** 5 分間待ってから行う |
KO 계속하기 전에 5분 동안 기다리십시오. | **ZH-CN** 等待 5 分钟再继续 | **ZH-TW** 等待 5 分鐘再繼續 |

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Introduction

About the GA700 Series

The GA700 is a high-end general-purpose AC drive designed for a wide range of industrial applications. It is engineered for seamless integration into machines and automation systems.

With built-in network connectivity, application-focused functions, and extensive customization capabilities, the GA700 provides exceptional flexibility while ensuring simple commissioning and operation. Its intuitive design minimizes engineering effort and helps reduce installation and startup time, enabling efficient implementation of automation solutions.



Drive Selection

GA700 drives should be selected based on the power supply voltage, motor rated current, application load profile, and the ambient conditions of the installation site.

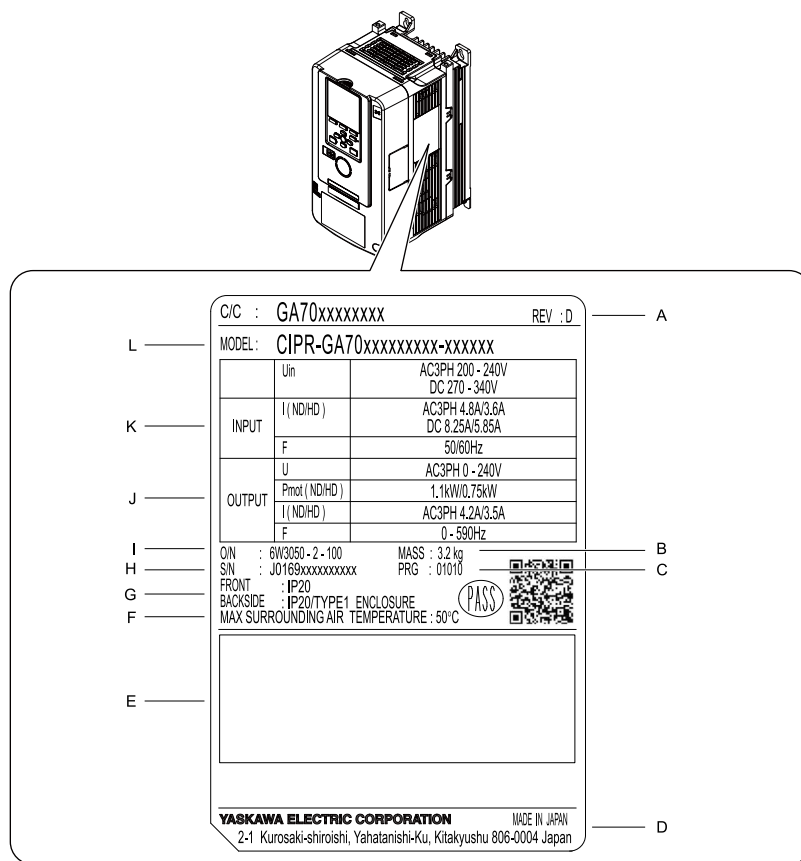
GA700 drives offer two separate performance ratings: Heavy Duty (HD) and Normal duty (ND).

Heavy Duty (HD) is intended for constant-torque applications requiring overload capability of up to 150% of the rated current for 1 minute, such as hoists, conveyors, presses, certain types of compressors, etc.

Normal Duty (ND) is intended for variable-torque applications with overload requirements of up to 110% of the rated current for 1 minute, such as fans, blowers, pumps, etc. Compared to the Heavy Duty rating, the Normal Duty rating allows the GA700 to drive a motor one frame size larger.

GA700 drives are designed to be wall-mounted upright and in clean environmental conditions. In case of special mounting methods (heatsink external, horizontal, etc.), high ambient temperature ($>50^{\circ}\text{C}$), high altitude (above 1000 m), use of high carrier frequency, and so forth, an output current derating must be considered when selecting the drive.

1.1 Nameplate



- | | |
|--|---------------------------|
| A - Hardware revision | G - Protection design |
| B - Weight | H - Serial number |
| C - Drive software version | I - Lot number |
| D - The address of the head office of Yaskawa Electric Corporation | J - Output specifications |
| E - Accreditation standards | K - Input specifications |
| F - Surrounding air temperature | L - Drive model |

Figure 1.1 Nameplate Information Example

1.2 How to Read the Model Number

Use the information in Figure 1.2 and Table 1.1 to read the drive model numbers.

CIPR- GA70 A 2 004 A B A A - C A A A A A

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Figure 1.2 Drive Model

Table 1.1 Model Number Details

No.	Description
1	Drive
2	Product series
3	Region code • A: Japan • B: China • C: Europe • D: India • K: Korea • T: Asia (Singapore and Taiwan) • U: Americas

No.	Description
4	Input power supply voltage • 2: Three-Phase AC 200 V Class • 4: Three-Phase AC 400 V Class
5	Rated output current Note: Refer to the tables for the rated output current by model.
6	EMC noise filter • A: No internal EMC filter • B: Internal category C3 EMC filter
7	Enclosure protection design • A: IP00 • B: IP20 • W: IP55/UL Type 12 Heatsink External Mounting
8	Environmental specification (Reserved)
9	Design revision order
10	Control circuit terminal board (Reserved)
11	Option (connector CN5-A) (Reserved)
12	Option (connector CN5-B) (Reserved)
13	Option (connector CN5-C) (Reserved)
14	Keypad (Reserved)
15	Special applications (Reserved)

1.3 Rated Output Current

Table 1.2 Three-Phase AC 200 V Class

Model	Heavy Duty Rating (HD) [C6-01 = 0] (Default)		Normal Duty Rating (ND) [C6-01 = 1]		Model Code	SAP #
	Maximum Applicable Motor Output kW	Rated Output Current A	Maximum Applicable Motor Output kW	Rated Output Current A		
2004	0.55	3.2	0.75	3.5	CIPR-GA70C2004BBAA-BAAAAA	100-182-859
2006	0.75	5	1.1	6	CIPR-GA70C2006BBAA-BAAAAA	100-182-860
2010	1.5	8	2.2	9.6	CIPR-GA70C2010BBAA-BAAAAA	100-182-862
2012	2.2	11	3	12.2	CIPR-GA70C2012BBAA-BAAAAA	100-182-863
2021	4	17.5	5.5	21	CIPR-GA70C2021BBAA-BAAAAA	100-182-865
2030	5.5	25	7.5	30	CIPR-GA70C2030BBAA-BAAAAA	100-182-866
2042	7.5	33	11	42	CIPR-GA70C2042BBAA-BAAAAA	100-182-867
2056	11	47	15	56	CIPR-GA70C2056BBAA-BAAAAA	100-182-868
2070	15	60	18.5	70	CIPR-GA70C2070BBAA-BAAAAA	100-200-365
2082	18.5	75	22	82	CIPR-GA70C2082BBAA-BAAAAA	100-200-366
2110	22	88	30	110	CIPR-GA70C2110BBAA-BAAAAA	100-200-367
2138	30	115	37	138	CIPR-GA70C2138BBAA-BAAAAA	100-207-545
2169	37	145	45	169	CIPR-GA70C2169BBAA-BAAAAA	100-207-546
2211	45	180	55	211	CIPR-GA70C2211BBAA-BAAAAA	100-207-547
2257	55	215	75	257	CIPR-GA70C2257BBAA-BAAAAA	100-207-548
2313	75	283	90	313	CIPR-GA70C2313BBAA-BAAAAA	100-207-549
2360	90	346	110	360	CIPR-GA70C2360BBAA-BAAAAA	10009991
2415	110	415	-	-	CIPR-GA70C2415BBAA-BAAAAA	10009992

Table 1.3 Three-Phase AC 400 V Class

Model	Heavy Duty Rating (HD) [C6-01 = 0] (Default)		Normal Duty Rating (ND) [C6-01 = 1]		Model Code	SAP #
	Maximum Applicable Motor Output kW	Rated Output Current A	Maximum Applicable Motor Output kW	Rated Output Current A		
4002	0.55	1.8	0.75	2.1	CIPR-GA70C4002BBAA-BAAAAA	100-182-869D
4004	1.1	3.4	1.5	4.1	CIPR-GA70C4004BBAA-BAAAAA	100-182-870D
4005	1.5	4.8	2.2	5.4	CIPR-GA70C4005BBAA-BAAAAA	100-182-871D
4007	2.2	5.5	3.0	7.1	CIPR-GA70C4007BBAA-BAAAAA	100-182-872D
4009	3.0	7.2	4.0	8.9	CIPR-GA70C4009BBAA-BAAAAA	100-182-873D
4012	4.0	9.2	5.5	11.9	CIPR-GA70C4012BBAA-BAAAAA	100-182-874D
4018	5.5	14.8	7.5	17.5	CIPR-GA70C4018BBAA-BAAAAA	100-182-875D
4023	7.5	18	11	23.4	CIPR-GA70C4023BBAA-BAAAAA	100-182-876D
4031	11	24	15	31	CIPR-GA70C4031BBAA-BAAAAA	100-182-877D
4038	15	31	18.5	38	CIPR-GA70C4038BBAA-BAAAAA	100-182-878D
4044	18.5	39	22	44	CIPR-GA70C4044BBAA-BAAAAA	100-200-368D
4060	22	45	30	59.6	CIPR-GA70C4060BBAA-BAAAAA	100-200-369D
4075	30	60	37	74.9	CIPR-GA70C4075BBAA-BAAAAA	100-200-699D
4089	37	75	45	89.2	CIPR-GA70C4089BBAA-BAAAAA	100-207-552D
4103	45	91	55	103	CIPR-GA70C4103BBAA-BAAAAA	100-207-553D
4140	55	112	75	140	CIPR-GA70C4140BBAA-BAAAAA	100-207-554D
4168	75	150	90	168	CIPR-GA70C4168BBAA-BAAAAA	100-207-555D
4208	90	180	110	208	CIPR-GA70C4208BBAA-BAAAAA	100-207-556D
4250	110	216	132	250	CIPR-GA70C4250BBAA-BAAAAA	100-207-557D
4296	132	260	160	296	CIPR-GA70C4296BBAA-BAAAAA	100-207-558D
4371	160	304	200	371	CIPR-GA70C4371BBAA-BAAAAA	100-207-559D
4389	200	371	220	389	CIPR-GA70C4389BBAA-BAAAAA	100-207-560D
4453	220	414	250	453	CIPR-GA70C4453BBAA-BAAAAA	100-207-561
4568	250	453	315	568	CIPR-GA70C4568BBAA-BAAAAA	100-207-562
4675	315	605	355	675	CIPR-GA70C4675BBAA-BAAAAA	100-207-563
4810	400	720	450	810	CIPR-GA70C4810BBAA-BAAAAA	10115605
4930	450	810	500	930	CIPR-GA70C4930BBAA-BAAAAA	10115606
4H11	500	930	560	1090	CIPR-GA70C4H11BBAA-BAAAAA	10115607
4H12	560	1090	630	1200	CIPR-GA70C4H12BBAA-BAAAAA	10115608

General Specification

Table 2.1 Control Characteristics

Item	Specification
Control Methods	• V/f Control • V/f Control with Encoder • Open Loop Vector • Closed Loop Vector • Advanced Open Loop Vector • PM Open Loop Vector • PM Advanced Open Loop Vector • PM Closed Loop Vector • EZ Vector Control
Frequency Control Range	• AOLV and EZOLV: 0.01 Hz to 120 Hz • CL-V/f, CLV, AOLV/PM, and CLV/PM: 0.01 Hz to 400 Hz • V/f, OLV, and OLV/PM: 0.01 Hz to 590 Hz
Frequency Accuracy (Temperature Fluctuation)	Digital inputs: $\pm 0.01\%$ of the maximum output frequency ($-10\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ ($14\text{ }^{\circ}\text{F}$ to $104\text{ }^{\circ}\text{F}$)) Analog inputs: $\pm 0.1\%$ of the maximum output frequency ($25\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$ ($77\text{ }^{\circ}\text{F} \pm 18\text{ }^{\circ}\text{F}$))
Frequency Setting Resolution	Digital inputs: 0.01 Hz Analog inputs: 1/2048 of the maximum output frequency (11-bit signed)
Output Frequency Resolution	0.001 Hz
Frequency Setting Signal	Main speed frequency reference: -10 Vdc to $+10\text{ Vdc}$ (20 k Ω), 0 Vdc to 10 Vdc (20 k Ω), 4 mA to 20 mA (250 Ω), 0 mA to 20 mA (250 Ω) Main speed reference: Pulse train input (maximum 32 kHz)
Starting Torque	• V/f: 150%/3 Hz • CL-V/f: 150%/3 Hz • OLV: 200%/0.3 Hz • CLV: 200%/0 min⁻¹ (r/min) • AOLV: 200%/0.3 Hz • OLV/PM: 100%/5% speed • AOLV/PM: 200%/0 min⁻¹ (r/min) • CLV/PM: 200%/0 min⁻¹ (r/min) • EZOLV: 100%/1% speed Note: • Correctly select the drive and motor capacity for this starting torque in these control methods: –OLV –CLV –AOLV –AOLV/PM –CLV/PM • Set $n8-57 = 1$ [<i>HFI Overlap Selection = Enabled</i>] for this starting torque in AOLV/PM. When you use a non-Yaskawa PM motor, do Rotational Auto-Tuning.

Item	Specification
Speed Control Range	• V/f: 1:40 • CL-V/f: 1:40 • OLV: 1:200 • CLV: 1:1500 • AOLV: 1:200 • OLV/PM: 1:20 • AOLV/PM: 1:100 • CLV/PM: 1:1500 • EZOLV: 1:100 Note: • Set $n8-57 = 1$ [<i>HFI Overlap Selection = Enabled</i>] for this Speed Control Range in AOLV/PM. When you use a non-Yaskawa PM motor, do Rotational Auto-Tuning. • Speed control range of 1:100 for AOLV/PM is Instantaneous operation range. Correctly select the drive and motor capacity for continuous operation.
Zero Speed Control	Possible in these control methods: • CLV • AOLV/PM • CLV/PM
Torque Limits	You can use parameter settings for different limits in four quadrants in these control methods: • OLV • CLV • AOLV • AOLV/PM • CLV/PM • EZOLV
Acceleration and Deceleration Times	0.0 s to 6000.0 s The drive can set four pairs of different acceleration and deceleration times.
Braking Torque	Approximately 20% Approximately 125% with a dynamic braking option • Short-time average deceleration torque - Motor output 0.4/0.75 kW: over 100% - Motor output 1.5 kW: over 50% - Motor output 2.2 kW and larger: over 20%, Overexcitation Braking/High Slip Braking allow for approximately 40% • Continuous regenerative torque: Approximately 20%. Dynamic braking option allows for approximately 125%, 10%ED, 10 s ⚠ WARNING! Crush Hazard Set $L3-04 = 0$ [<i>Stall Prevention during Decel = Disabled</i>] when you operate the drive with: • a regenerative converter • regenerative unit • braking unit • braking resistor • braking resistor unit If you set the parameter incorrectly, the length of time for the motor to stop will be longer than the set deceleration time and can cause death or serious injury. Note: • Models 2004 to 2138 and 4002 to 4168 have a braking transistor. • Short-time average deceleration torque refers to the necessary torque to decelerate the motor (uncoupled from the load) from the rated speed to zero. Motor characteristics can change the actual specifications. • Motor characteristics change the continuous regenerative torque and short-time average deceleration torque for motors 2.2 kW and larger.

Item	Specification
V/f Characteristics	Select from 15 pre-defined V/f patterns, or a user-set V/f pattern.
Main Control Functions	Torque Control, Droop Control, Speed/Torque Control Switching, Feed Forward Control, Zero Servo Function, Restart After Momentary Power Loss, Speed Search, Overtorque/Undertorque Detection, Torque Limit, 17-Step Speed (max.), Accel/Decel Switch, S-curve Acceleration/Deceleration, 3-wire Sequence, Auto-Tuning (Rotational and Stationary), Dwell Function, 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/Modbus Communication (RS-485 max, 115.2 kbps), Auto Restart, Application Presets, DriveWorksEZ (customized functions), Removable Terminal Block with Parameter Backup Function, Online Tuning, KEB, Overexcitation Deceleration, Inertia (ASR) Tuning, Overvoltage Suppression, High Frequency Injection

Table 2.2 Protection Functions

Item	Specification
Motor Protection	Electronic thermal overload protection
Momentary Overcurrent Protection	Drive stops when the output current is more than 200% of the HD output current.
Overload Protection	Drive stops when the output current is more than these overload tolerances: - HD: 150% of the rated output current for 60 seconds The permitted frequency of overload is one time each 10 minutes. - ND: 110% of the rated output current for 60 seconds The permitted frequency of overload is one time each 10 minutes. Note: If output frequency < 6 Hz, the drive can trigger the overload protection function when the output current is in the overload tolerance range.
Overvoltage Protection	200 V Class: Stops when the DC bus voltage is more than approximately 410 V 400 V Class: Stops when the DC bus voltage is more than approximately 820 V
Undervoltage Protection	200 V Class: Stops when the DC bus voltage decreases to less than approximately 190 V 400 V Class: Stops when the DC bus voltage decreases to less than approximately 380 V
Momentary Power Loss Ride-thru	Stops when power loss is longer than 15 ms. Continues operation if power loss is shorter than 2 s (depending on parameter settings). Note: - The stop time can be shorter depending on the load and motor speed. - Drive capacity will change the continuous operation time. A Momentary Power Loss Recovery Unit is necessary to continue operation through a 2 s power loss on models 2004 to 2056 and 4002 to 4031.
Heatsink Overheat Protection	The drive stops when the thermistor detects an IGBT temperature more than approximately 100°C (212°F). The trip temperature level is different for different drive models.
Braking Resistor Overheat Protection	Overheat detection for braking resistor (optional ERF-type, 3% ED)
Stall Prevention	Stall prevention is available during acceleration, deceleration, and during run.
Ground Fault Protection	Electronic circuit protection Note: This protection detects ground faults during run. The drive will not provide protection when: - There is a low-resistance ground fault for the motor cable or terminal block - You energize the drive when there is a ground fault.
DC Bus Charge LED	Charge LED illuminates when DC bus voltage is more than 50 V.

Table 2.3 Environment

Item	Specification
Area of Use	Indoors
Power Supply	Overvoltage Category III

Item	Specification
Surrounding Air Temperature	IP00/UL Open Type: -10 °C to +50 °C (14 °F to 122 °F) IP20/UL Open Type: -10 °C to +50 °C (14 °F to 122 °F) IP20/UL Type 1: -10 °C to +40 °C (14 °F to 104 °F) - When you install the drive in an enclosure, use a cooling fan or air conditioner to keep the internal air temperature in the permitted range. - Do not let the drive freeze. - You can use IP00/IP20/UL Open Type drives at a maximum of 60 °C (140 °F) when you derate the output current. - You can use IP20/UL Type 1 drives at a maximum of 50 °C (122 °F) when you derate the output current.
Humidity	95% RH or less Do not let condensation form on the drive.
Storage Temperature	-20 °C to +70 °C (-4 °F to +158 °F) (short-term temperature during transportation)
Surrounding Area	Pollution degree 2 or less Install the drive in an area without: - Oil mist, corrosive or flammable gas, or dust - Metal powder, oil, water, or other unwanted materials - Radioactive materials or flammable materials, including wood - Harmful gas or fluids - Salt - Direct sunlight
Altitude	1000 m (3281 ft) Maximum Note: Derate the output current by 1% for each 100 m (328 ft) to install the drive in altitudes between 1000 m to 4000 m (3281 ft to 13123 ft). It is not necessary to derate the rated voltage in these conditions: - Installing the drive at 2000 m (6562 ft) or lower - Installing the drive between 2000 m to 4000 m (6562 ft to 13123 ft) and grounding the neutral point on the power supply. Contact Yaskawa or your nearest sales representative if you will not ground the neutral point.
Vibration *1	10 Hz to 20 Hz: 2004 to 2415, 4002 to 4675: 1 G (9.8 m/s², 32.15 ft/s²) 4810 to 4H12: 0.6 G (5.9 m/s², 19.36 ft/s²) 20 Hz to 55 Hz: 2004 to 2211, 4002 to 4168: 0.6 G (5.9 m/s², 19.36 ft/s²) 2257 to 2415, 4208 to 4H12: 0.2 G (2.0 m/s², 6.56 ft/s²)
Installation Orientation	Install the drive vertically for sufficient airflow to cool the drive.

*1 This drive passed the vibration test with a logarithmic sweep as specified by EN 60068-2-6 and JIS C60068-2-6. If the internal components of the drive vibrate too much, it can cause damage to the drive even when the vibration frequency is in the specification. If the drive components vibrate, improve the installation environment to decrease vibration. To improve the installation environment for vibration, you can put the motor on a rubber pad or reinforce the structure of the installation.

Table 2.4 Standard

Item	Specification
Applicable Standards	- UL 61800-5-1 - EN 61800-3 - IEC/EN 61800-5-1 - Two Safe Disable inputs and one EDM output according to EN ISO 13849-1:2015 (PL e (Cat.III)), IEC/EN 61508 SIL3
Enclosure Protection Design	IP00/UL Open Type IP20/UL Open Type IP20/UL Type 1 Note: To change an IP20/UL Open Type drive to an IP20/UL Type 1 drive, install a UL Type 1 kit.

Power Ratings

3.1 Model Specifications (200 V Class)

Table 3.1 Rating (200 V Class)

Model			2004	2006	2010	2012	2018	2021	2030	2042	
Maximum Applicable Motor Output (kW)		HD *1	0.55	0.75	1.5	2.2	3	3.7	5.5	7.5	
		ND *2	0.75	1.1	2.2	3	3.7	5.5	7.5	11	
Input	Rated Input Current (A)	HD (AC)	3.6	4.8	8.9	12.7	17	20.7	30	40.3	
		ND (AC)	4.8	6.7	12.7	17	20.7	30	40.3	52	
Output	Rated Out-put Capacity (kVA)	HD *3	1.2	1.9	3.0	4.2	5.3	6.7	9.5	12.6	
		ND *4	1.3	2.3	3.7	4.6	6.7	8.0	11.4	16.0	
	Rated Out-put Current (A)	HD	3.2	5	8	11	14	17.5	25	33	
		ND	3.5	6	9.6	12.2	17.5	21	30	42	
	Overload Tolerance		- HD: 150% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. - ND: 110% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. Note: Derating can be necessary for applications that start and stop frequently.								
	Carrier Frequency		HD: 8 kHz without derating the drive capacity. ND: 2 kHz without derating the drive capacity. Derate the drive capacity to use values to 15 kHz maximum.								
	Maximum Output Voltage		Three-phase 200 V to 240 V Note: The maximum output voltage is proportional to the input voltage.								
	Maximum Output Frequency		- AOLV and EZOLV: 120 Hz - CL-V/f, CLV, AOLV/PM, and CLV/PM: 400 Hz - V/f, OLV, OLV/PM: 590 Hz								
	Measures for Harmonics	DC reactor		External options							
	Braking Device	Braking Transistor		Standard internal characteristics							
EMC Filter	EMC Filter IEC 61800-3, C3		Factory option Models 2xxxB: There is a category C3 EMC filter in the drive.								
Power Supply	Rated Voltage, Rated Frequency		- Three-phase AC power supply 200 V to 240 V at 50/60 Hz - DC power supply 270 V to 340 V								
	Permitted Voltage Fluctuation		-15% to +10%								
	Permitted Frequency Fluctuation		±5%								
	Input Power (kVA)	HD	1.5	2.0	3.7	5.3	7.1	8.6	12.5	16.8	
		ND	2.0	2.8	5.3	7.1	8.6	12.5	16.8	21.6	

- *1 The maximum applicable motor output complies with 208 V motor ratings as specified in NEC Table 430.250. The rated output current of the drive output amps must be equal to or more than the motor rated current.
- *2 The maximum applicable motor output is based on 4-pole, general-purpose 220 V motor ratings. The rated output current of the drive output amps must be equal to or more than the motor rated current.
- *3 The rated output capacity is calculated with a rated output voltage of 208 V.
- *4 The rated output capacity is calculated with a rated output voltage of 220 V.

Table 3.2 Rating (200 V Class)

Model			2056	2070	2082	2110	2138
Maximum Applicable Motor Output (kW)		HD *1	11	15	18.5	22	30
		ND *2	15	18.5	22	30	37
Input	Rated Input Current (A)	HD (AC)	58.2	78.4	96	82	111
		ND (AC)	78.4	96	114	111	136
Output	Rated Output Capacity (kVA)	HD *3	17.9	22.9	28.6	33.5	43.8
		ND *4	21.3	26.7	31.2	41.9	52.6
	Rated Output Current (A)	HD	47	60	75	88	115
		ND	56	70	82	110	138
	Overload Tolerance		• HD: 150% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. • ND: 110% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. Note: Derating can be necessary for applications that start and stop frequently.				
	Carrier Frequency		HD: 8 kHz without derating the drive capacity. ND: 2 kHz without derating the drive capacity. Derate the drive capacity to use values to 15 kHz maximum.				
	Maximum Output Voltage		Three-phase 200 V to 240 V Note: The maximum output voltage is proportional to the input voltage.				
	Maximum Output Frequency		• AOLV and EZOLV: 120 Hz • CL-V/f, CLV, AOLV/PM, and CLV/PM: 400 Hz • V/f, OLV, OLV/PM: 590 Hz				
Measures for Harmonics	DC reactor		External options			Standard internal characteristics	
Braking Device	Braking Transistor		Standard internal characteristics				
EMC Filter	EMC Filter IEC 61800-3, C3		Factory option • Models 2xxxB: There is a category C3 EMC filter in the drive.				
Power Supply	Rated Voltage, Rated Frequency		• Three-phase AC power supply 200 V to 240 V at 50/60 Hz • DC power supply 270 V to 340 V				
	Permitted Voltage Fluctuation		-15% to +10%				
	Permitted Frequency Fluctuation		±5%				
	Input Power (kVA)	HD	24.2	32.6	39.9	34.1	46.1
		ND	32.6	39.9	47.4	46.1	56.5

- *1 The maximum applicable motor output complies with 208 V motor ratings as specified in NEC Table 430.250. The rated output current of the drive output amps must be equal to or more than the motor rated current.
- *2 The maximum applicable motor output is based on 4-pole, general-purpose 220 V motor ratings. The rated output current of the drive output amps must be equal to or more than the motor rated current.
- *3 The rated output capacity is calculated with a rated output voltage of 208 V.
- *4 The rated output capacity is calculated with a rated output voltage of 220 V.

Table 3.3 Rating (200 V Class)

Model			2169	2211	2257	2313	2360	2415
Maximum Applicable Motor Output (kW)		HD *1	37	45	55	75	90	110
		ND *2	45	55	75	90	110	-
Input	Rated Input Current (A)	HD (AC)	136	164	200	271	324	394
		ND (AC)	164	200	271	324	394	-
Output	Rated Out-put Capacity (kVA)	HD *3	55.3	68.6	81.9	108	132	158
		ND *4	64.4	80.4	97.9	119	137	
	Rated Out-put Current (A)	HD	145	180	215	283	346	415
		ND	169	211	257	313	360	-
	Overload Tolerance		- HD: 150% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. - ND: 110% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. Note: Derating can be necessary for applications that start and stop frequently.					
	Carrier Frequency		HD: 5 kHz without derating the drive capacity. ND: 2 kHz without derating the drive capacity. Derate the drive capacity to use values to 10 kHz maximum.					
	Maximum Output Volt-age (V)		Three-phase 200 V to 240 V Note: The maximum output voltage is proportional to the input voltage.					
	Maximum Output Frequency		- AOLV and EZOLV: 120 Hz - CL-V/f, CLV, AOLV/PM, and CLV/PM: 400 Hz - V/f, OLV, OLV/PM: 590 Hz					
Measures for Harmonics	DC reactor		Standard internal characteristics					
Braking Device	Braking Transistor		External options					
EMC Filter	EMC Filter IEC 61800-3, C3		Factory option Models 2xxxB: There is a category C3 EMC filter in the drive.					
Power Supply	Rated Voltage, Rated Frequency		- Three-phase AC power supply 200 V to 240 V at 50/60 Hz - DC power supply 270 V to 340 V					
	Permitted Voltage Fluctuation		-15% to +10%					
	Permitted Frequency Fluctuation		±5%					
	Input Power (kVA)	HD	56.5	68.2	83.1	113	135	164
		ND	68.2	83.1	113	135	164	-

- *1 The maximum applicable motor output complies with 208 V motor ratings as specified in NEC Table 430.250. The rated output current of the drive output amps must be equal to or more than the motor rated current.
- *2 The maximum applicable motor output is based on 4-pole, general-purpose 220 V motor ratings. The rated output current of the drive output amps must be equal to or more than the motor rated current.
- *3 The rated output capacity is calculated with a rated output voltage of 208 V.
- *4 The rated output capacity is calculated with a rated output voltage of 220 V.

3.2 Model Specifications (400 V Class)

Table 3.4 Rating (400 V Class)

Model		Duty Rating	4002	4004	4005	4007	4009	4012	4018	4023
Maximum Applicable Motor Output (kW)		HD	0.55	1.1	1.5	2.2	3.0	4.0	5.5	7.5
		ND	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11
Input	Rated Input Current (A)	HD (AC)	1.9	3.5	4.7	6.7	8.9	11.7	15.8	21.2
		ND (AC)	2.5	4.7	6.7	8.9	11.7	15.8	21.2	30.6
Output	Rated Output Capacity (kVA)	HD	1.2	2.2	3.2	3.6	4.7	6.1	10	12
		ND	1.4	2.7	3.6	4.7	5.9	7.8	12	15
	Rated Output Current (A)	HD	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18
		ND	2.1	4.1	5.4	7.1	8.9	11.9	17.5	23.4
	Overload Tolerance		- HD: 150% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. - ND: 110% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. Note: Derating can be necessary for applications that start and stop frequently.							
	Carrier Frequency		HD: 8 kHz without derating the drive capacity. ND: 2 kHz without derating the drive capacity. Derate the drive capacity to use values to 15 kHz maximum.							
	Maximum Output Voltage		Three-phase 380 V to 480 V Note: The maximum output voltage is proportional to the input voltage.							
	Maximum Output Frequency		- AOLV and EZOLV: 120 Hz - CL-V/f, CLV, AOLV/PM, and CLV/PM: 400 Hz - V/f, OLV, OLV/PM: 590 Hz							
	Measures for Harmonics		DC reactor							
	Braking Device		Braking Transistor							
EMC Filter		EMC Filter IEC 61800-3, C3	Factory option Models 4xxxB: There is a category C3 EMC filter in the drive.							
Power Supply	Rated Voltage, Rated Frequency		- Three-phase AC power supply 380 V to 480 V at 50/60 Hz - DC power supply 513 V to 679 V							
	Permitted Voltage Fluctuation		-15% to +10%							
	Permitted Frequency Fluctuation		±5%							
	Input Power (kVA)	HD	1.5	2.8	3.7	5.3	7.1	9.3	13	17
		ND	2.0	3.7	5.3	7.1	9.3	13	17	24

*1 The maximum applicable motor output complies with 380 V motor ratings as specified in Annex G of IEC 60947-4-1. The rated output current of the drive output amps must be equal to or more than the motor rated current.

*2 The rated output capacity is calculated with a rated output voltage of 380 V.

Table 3.5 Rating (400 V Class)

Model		Duty Rating	4031	4038	4044	4060	4075	4089	4103
Maximum Applicable Motor Output (kW)		HD	11	15	18.5	22	30	37	45
		ND	15	18.5	22	30	37	45	55
Input	Rated Input Current (A)	HD (AC)	30.6	41.3	50.5	43.1	58.3	71.5	86.5
		ND (AC)	41.3	50.5	59.7	58.3	71.5	86.5	105

Model		Duty Rating	4031	4038	4044	4060	4075	4089	4103
Output	Rated Output Capacity (kVA)	HD	16	20	26	30	39	49	60
		ND	20	25	29	39	49	59	68
	Rated Output Current (A)	HD	24	31	39	45	60	75	91
		ND	31	38	44	59.6	74.9	89.2	103
	Overload Tolerance		- HD: 150% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. - ND: 110% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. Note: Derating can be necessary for applications that start and stop frequently.						
	Carrier Frequency		HD: 8 kHz without derating the drive capacity. ND: 2 kHz without derating the drive capacity. Derate the drive capacity to use values to 15 kHz maximum.						
	Maximum Output Voltage		Three-phase 380 V to 480 V Note: The maximum output voltage is proportional to the input voltage.						
	Maximum Output Frequency		- AOLV and EZOLV: 120 Hz - CL-V/f, CLV, AOLV/PM, and CLV/PM: 400 Hz - V/f, OLV, OLV/PM: 590 Hz						
Measures for Harmonics	DC reactor		External options			Standard internal characteristics			
Braking Device	Braking Transistor		Standard internal characteristics						
EMC Filter	EMC Filter IEC 61800-3, C3		Factory option Models 4xxxB: There is a category C3 EMC filter in the drive.						
Power Supply	Rated Voltage, Rated Frequency		- Three-phase AC power supply 380 V to 480 V at 50/60 Hz - DC power supply 513 V to 679 V						
	Permitted Voltage Fluctuation		-15% to +10%						
	Permitted Frequency Fluctuation		±5%						
	Input Power (kVA)	HD	24	33	40	34	46	57	69
		ND	33	40	48	46	57	69	84

*1 The maximum applicable motor output complies with 380 V motor ratings as specified in Annex G of IEC 60947-4-1. The rated output current of the drive output amps must be equal to or more than the motor rated current.

*2 The rated output capacity is calculated with a rated output voltage of 380 V.

Table 3.6 Rating (400 V Class)

Model		Duty Rating	4140	4168	4208	4250	4296	4371	4389
Maximum Applicable Motor Output (kW)		HD	55	75	90	110	132	160	200
		ND	75	90	110	132	160	200	220
Input	Rated Input Current (A)	HD (AC)	105	142	170	207	248	300	373
		ND (AC)	142	170	207	248	300	373	410

Model		Duty Rating	4140	4168	4208	4250	4296	4371	4389
Output	Rated Output Capacity (kVA)	HD	74	99	118	142	171	200	244
		ND	92	111	137	165	195	244	256
	Rated Output Current (A)	HD	112	150	180	216	260	304	371
		ND	140	168	208	250	296	371	389
	Overload Tolerance		- HD: 150% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. - ND: 110% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. Note: Derating can be necessary for applications that start and stop frequently.						
	Carrier Frequency		HD: 5 kHz without derating the drive capacity. ND: 2 kHz without derating the drive capacity. Derate the drive capacity to use values to 10 kHz maximum.						
	Maximum Output Voltage		Three-phase 380 V to 480 V Note: The maximum output voltage is proportional to the input voltage.						
	Maximum Output Frequency		- AOLV and EZOLV: 120 Hz - CL-V/f, CLV, AOLV/PM, and CLV/PM: 400 Hz - V/f, OLV, OLV/PM: 590 Hz						
Measures for Harmonics	DC reactor		Standard internal characteristics						
Braking Device	Braking Transistor		Standard internal characteristics		External options				
EMC Filter	EMC Filter IEC 61800-3, C3		Factory option Models 4xxxB: There is a category C3 EMC filter in the drive.						
Power Supply	Rated Voltage, Rated Frequency		- Three-phase AC power supply 380 V to 480 V at 50/60 Hz - DC power supply 513 V to 679 V						
	Permitted Voltage Fluctuation		-15% to +10%						
	Permitted Frequency Fluctuation		±5%						
	Input Power (kVA)	HD	84	113	135	165	198	239	297
		ND	113	135	165	198	239	297	327

*1 The maximum applicable motor output complies with 380 V motor ratings as specified in Annex G of IEC 60947-4-1. The rated output current of the drive output amps must be equal to or more than the motor rated current.

*2 The rated output capacity is calculated with a rated output voltage of 380 V.

Table 3.7 Rating (400 V Class)

Model		Duty Rating	4453	4568	4675	4810	4930	4H11	4H12
Maximum Applicable Motor Output (kW)		HD	220	250	315	400	450	500	560
		ND	250	315	355	450	500	560	630
Input	Rated Input Current (A)	HD (AC)	410	465	584	783	830	976	1031
		ND (AC)	465	584	657	879	922	1091	1158

Model		Duty Rating	4453	4568	4675	4810	4930	4H11	4H12
Output	Rated Output Capacity (kVA)	HD	272	298	398	474	533	612	717
		ND	298	374	444	533	612	717	790
	Rated Output Current (A)	HD	414	453	605	720	810	930	1090
		ND	453	568	675	810	930	1090	1200
	Overload Tolerance		- HD: 150% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. - ND: 110% of the rated output current for 60 seconds. The permitted frequency of overload is one time each 10 minutes. Note: Derating can be necessary for applications that start and stop frequently.						
	Carrier Frequency		HD: 2 kHz without derating the drive capacity. ND: 2 kHz without derating the drive capacity. Derate the drive capacity to use values to 5 kHz maximum.						
	Maximum Output Voltage		Three-phase 380 V to 480 V Note: The maximum output voltage is proportional to the input voltage.						
Maximum Output Frequency		- AOLV and EZOLV: 120 Hz - CL-V/f, CLV, AOLV/PM, and CLV/PM: 400 Hz - V/f, OLV, OLV/PM: 590 Hz							
Measures for Harmonics	DC reactor		Standard internal characteristics						
Braking Device	Braking Transistor		External options						
EMC Filter	EMC Filter IEC 61800-3, C3		Factory option Models 4xxxB: There is a category C3 EMC filter in the drive.			Factory option			
Power Supply	Rated Voltage, Rated Frequency		- Three-phase AC power supply 380 V to 480 V at 50/60 Hz - DC power supply 513 V to 679 V						
	Permitted Voltage Fluctuation		-15% to +10%						
	Permitted Frequency Fluctuation		±5%						
	Input Power (kVA)	HD	327	370	465	624	662	777	821
ND		370	465	523	701	734	870	923	

*1 The maximum applicable motor output complies with 380 V motor ratings as specified in Annex G of IEC 60947-4-1. The rated output current of the drive output amps must be equal to or more than the motor rated current.

*2 The rated output capacity is calculated with a rated output voltage of 380 V.

Drive Watt Loss

4.1 200 V Class

Table 4.1 Drive Watt Loss (Heavy Duty)

Model	The rated output current A	Carrier Frequency kHz	Interior Unit Loss W	Cooling Fin Loss W	Total Loss W
2004	3.2	8	35	18	53
2006	5	8	37	26	63
2010	8	8	44	43	87
2012	11	8	50	61	111
2018	14	8	47	82	129
2021	17.5	8	56	105	161
2030	25	8	74	174	248
2042	33	8	88	183	271
2056	47	8	112	267	379
2070	60	8	145	373	518
2082	75	8	179	478	657
2110	88	8	155	563	718
2138	115	8	212	680	892
2169	145	5	275	820	1095
2211	180	5	314	991	1305
2257	215	5	398	1252	1650
2313	283	5	502	1643	2145
2360	346	5	582	1978	2560
2415	415	5	644	2359	3003

Table 4.2 Drive Watt Loss (Normal Duty)

Model	The rated output current A	Carrier Frequency kHz	Interior Unit Loss W	Cooling Fin Loss W	Total Loss W
2004	3.5	2	35	16	51
2006	6	2	38	25	63
2010	9.6	2	49	46	95
2012	12.2	2	56	62	118
2018	17.5	2	53	88	141
2021	21	2	75	125	200
2030	30	2	95	206	301
2042	42	2	129	227	356
2056	56	2	149	302	451
2070	70	2	177	403	580

Model	The rated output current A	Carrier Frequency kHz	Interior Unit Loss W	Cooling Fin Loss W	Total Loss W
2082	82	2	202	467	669
2110	110	2	192	631	823
2138	138	2	269	814	1083
2169	169	2	338	941	1279
2211	211	2	384	1131	1515
2257	257	2	519	1534	2053
2313	313	2	579	1794	2373
2360	360	2	655	2071	2726
2415	-	-	-	-	-

4.2 400 V Class

Table 4.3 Drive Watt Loss (Heavy Duty)

Model	The rated output current A	Carrier Frequency kHz	Interior Unit Loss W	Cooling Fin Loss W	Total Loss W
4002	1.8	8	38	15	53
4004	3.4	8	42	28	70
4005	4.8	8	46	37	83
4007	5.5	8	48	45	93
4009	7.2	8	37	61	98
4012	9.2	8	46	82	128
4018	14.8	8	65	140	205
4023	18	8	73	150	223
4031	24	8	101	211	312
4038	31	8	119	272	391
4044	39	8	148	354	502
4060	45	8	126	389	515
4075	60	8	165	527	692
4089	75	8	184	617	801
4103	91	8	237	779	1016
4140	112	5	300	956	1256
4168	150	5	486	1274	1760
4208	180	5	446	1432	1878
4250	216	5	558	1464	2022
4296	260	5	692	2061	2753
4371	304	5	824	2346	3170
4389	371	5	777	2212	2989
4453	414	2	963	2696	3659
4568	453	2	1086	3035	4121
4675	605	2	1328	3995	5323
4810	720	2	2009	5424	7433
4930	810	2	2030	6102	8132
4H11	930	2	2553	7092	9646
4H12	1090	2	2763	8197	10959

Table 4.4 Drive Watt Loss (Normal Duty)

Model	The rated output current A	Carrier Frequency kHz	Interior Unit Loss W	Cooling Fin Loss W	Total Loss W
4002	2.1	2	39	16	55
4004	4.1	2	44	33	77
4005	5.4	2	48	31	79
4007	7.1	2	52	44	96
4009	8.9	2	42	58	100
4012	11.9	2	57	84	141
4018	17.5	2	82	144	226
4023	23.4	2	108	185	293
4031	31	2	138	222	360
4038	38	2	145	270	415
4044	44	2	168	335	503
4060	59.6	2	157	444	601
4075	74.9	2	185	527	712
4089	89.2	2	212	665	877
4103	103	2	264	766	1030
4140	140	2	393	1126	1519
4168	168	2	574	1348	1922
4208	208	2	493	1465	1958
4250	250	2	686	1738	2424
4296	296	2	805	2155	2960
4371	371	2	1022	2553	3575
4389	389	2	867	2393	3260
4453	453	2	1086	3035	4121
4568	568	2	1429	3989	5418
4675	675	2	1526	4572	6098
4810	810	2	2314	6170	8484
4930	930	2	2330	7028	9358
4H11	1090	2	3003	8301	11304
4H12	1200	2	3169	9193	12362

Deratings

5.1 Carrier Frequency Deratings

The rated current of GA700 drives might need to be reduced depending on the selected carrier frequency.

Relations between HD/ND setting, carrier frequency and rated output current are shown below.

5.1.1 200 V Class

Table 5.1 Carrier Frequency and Rated Current Derating When A1-02 = 0, 1, 2, 3, 5, 7, 8

Model	Rated Current (A)											
	Heavy Duty Rating (HD1)						Normal Duty Rating (ND1)					
	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	15 kHz	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	15 kHz
2004	3.2	3.2	3.2	3.1	2.9	2.78	3.5	3.3	2.9	2.7	2.4	2.1
2006	5.0	5.0	5.0	4.8	4.6	4.3	6.0	5.6	5.0	4.6	4.1	3.6
2010	8.0	8.0	8.0	7.4	6.6	5.8	9.6	9.0	8.0	7.4	6.6	5.8
2012	11.0	11.0	11.0	10.4	9.6	8.8	12.0	11.7	11.0	10.5	9.9	9.3
2018	14.0	14.0	14.0	12.6	10.8	9.1	17.5	16.1	14.0	12.6	10.8	9.1
2021	17.5	17.5	17.5	16.1	14.3	12.6	21.0	19.6	17.0	16.1	14.3	12.5
2030	25.0	25.0	25.0	23.0	20.5	18.0	30.0	28.0	25.0	23.0	20.5	18.0
2042	33.0	33.0	33.0	29.3	24.8	20.2	42.0	38.4	33.0	29.4	24.9	20.4
2056	47.0	47.0	47.0	43.4	38.9	34.4	56.0	52.4	47.0	43.4	38.9	34.4
2070	60.0	60.0	60.0	56.0	51.0	46.0	70.0	66.0	60.0	56.0	51.0	46.0
2082	75.0	75.0	75.0	68.6	60.5	53.0	82.0	82.0	75.0	68.8	61.0	53.1
2110	88.0	88.0	88.0	80.5	71.0	62.0	110.0	102.7	92.0	84.3	75.2	66.0
2138	115.0	115.0	115.0	105.1	92.8	81.0	138.0	128.8	115.0	105.8	94.3	82.8
2169	145.0	145.0	125.2	112.0	-	-	169.0	152.7	128.3	112.0	-	-
2211	180.0	180.0	155.2	138.6	-	-	211.0	190.2	158.9	138.1	-	-
2257	215.0	215.0	184.8	164.7	-	-	257.0	230.4	190.5	163.9	-	-
2313	283.0	283.0	249.0	226.4	-	-	313.0	288.5	251.7	227.1	-	-
2360	346.0	346.0	294.3	259.8	-	-	360.0	330.8	287.6	258.8	-	-
2415	415.0	415.0	365.2	332.0	-	-	415.0	391.3	355.7	332.0	-	-

Table 5.2 Carrier Frequency and Rated Current Derating When A1-02 = 4 [AOLV]

Model	Rated Current (A)									
	Heavy Duty Rating (HD1)					Normal Duty Rating (ND1)				
	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz
2004	3.2	3.2	3.0	2.8	2.6	3.5	3.0	2.4	2.1	1.7
2006	5.0	5.0	4.6	4.3	4.0	6.0	5.1	4.0	3.6	2.8
2010	8.0	8.0	6.7	5.8	4.5	9.6	8.2	7.0	5.8	4.6
2012	11.0	11.0	9.8	8.8	7.7	12.0	11.1	10.0	9.3	8.4

Model	Rated Current (A)									
	Heavy Duty Rating (HD1)					Normal Duty Rating (ND1)				
	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz
2018	14.0	14.0	11.2	9.1	6.4	17.5	14.3	11.0	9.1	6.4
2021	17.5	17.5	14.7	12.6	9.9	21.0	17.8	15.0	12.5	9.9
2030	25.0	25.0	21.0	18.0	14.3	30.0	25.5	21.0	18.0	14.3
2042	33.0	33.0	25.7	20.2	13.3	42.0	33.9	26.0	20.4	13.7
2056	47.0	47.0	39.8	34.4	27.7	56.0	47.9	40.0	34.4	27.6
2070	60.0	60.0	52.0	46.0	38.5	70.0	61.0	52.0	46.0	38.5
2082	75.0	75.0	62.1	52.5	40.4	82.0	76.7	63.0	53.1	41.4
2110	88.0	88.0	72.9	61.6	47.5	110.0	93.5	77.0	66.0	52.3
2138	115.0	115.0	95.3	80.5	62.0	138.0	117.3	97.0	82.8	65.6
2169	145.0	128.5	98.8	78.9	-	169.0	132.3	95.7	71.2	-
2211	180.0	159.3	122.0	97.2	-	211.0	164.1	117.2	86.0	-
2257	215.0	189.8	144.5	114.3	-	257.0	197.2	137.3	97.4	-
2313	283.0	254.7	203.8	169.8	-	313.0	257.8	202.6	165.8	-
2360	346.0	302.9	225.3	173.6	-	360.0	294.8	230.0	186.8	-
2415	415.0	373.5	298.8	249.0	-	415.0	361.6	308.3	272.7	-

Table 5.3 Carrier Frequency and Rated Current Derating When $A1-02 = 6$ [AOLV/PM]

Model	Rated Current (A)											
	Heavy Duty Rating (HD1)						Normal Duty Rating (ND1)					
	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz
2004	3.2	3.2	3.1	3.0	2.8	2.6	3.5	3.1	2.8	2.4	2.1	1.7
2006	5.0	5.0	4.9	4.6	4.3	4.1	6.0	5.4	4.8	4.2	3.6	3.0
2010	8.0	8.0	7.7	6.7	5.8	4.8	9.6	8.6	7.7	6.7	5.8	4.8
2012	11.0	11.0	10.7	9.8	8.8	7.9	12.2	11.5	10.7	10.0	9.3	8.6
2018	14.0	14.0	13.3	11.2	9.1	6.9	17.5	15.4	13.3	11.2	9.1	6.9
2021	17.5	17.5	16.8	14.7	12.6	10.4	21.0	18.9	16.8	14.6	12.5	10.4
2030	25.0	25.0	24.0	21.0	18.0	15.0	30.0	27.0	24.0	21.0	18.0	15.0
2042	33.0	33.0	31.2	25.7	20.2	14.7	42.0	36.6	31.2	25.8	20.4	15.0
2056	47.0	47.0	45.2	39.8	34.4	29.0	56.0	50.6	45.2	39.8	34.4	29.0
2070	60.0	60.0	58.0	52.0	46.0	40.0	70.0	64.0	58.0	52.0	46.0	40.0
2082	75.0	75.0	71.8	62.1	52.5	42.9	82.0	81.4	72.0	62.6	53.1	43.7
2110	88.0	88.0	84.2	72.9	61.6	50.3	110.0	99.0	88.0	77.0	66.0	55.0
2138	115.0	115.0	110.1	95.3	80.5	65.7	138.0	124.2	110.4	96.6	82.8	69.0
2169	145.0	138.4	118.6	98.8	78.9	-	169.0	144.6	120.1	95.7	71.2	-
2211	180.0	171.7	146.9	122.0	97.2	-	211.0	179.7	148.5	117.2	86.0	-
2257	215.0	204.9	174.7	144.5	114.3	-	257.0	217.1	177.2	137.3	97.4	-
2313	283.0	271.7	237.7	203.8	169.8	-	313.0	276.2	239.4	202.6	165.8	-
2360	346.0	328.8	277.0	225.3	173.6	-	359.6	316.4	273.2	230.0	186.8	-
2415	415.0	398.4	348.6	298.8	249.0	-	415.0	379.4	343.9	308.3	272.7	-

5.1.2 400 V Class

Table 5.4 Carrier Frequency and Rated Current Derating When A1-02 = 0, 1, 2, 3, 5, 7, 8 (< 460 V)

Model	Rated Current (A)											
	Heavy Duty Rating (HD1)						Normal Duty Rating (ND1)					
	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	15 kHz	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	15 kHz
4002	1.8	1.8	1.8	1.6	1.3	1.0	2.1	2.0	1.8	1.7	1.5	1.4
4004	3.4	3.4	3.4	2.9	2.3	1.7	4.1	3.8	3.4	3.1	2.8	2.4
4005	4.8	4.8	4.8	4.3	3.7	3.0	5.4	5.2	4.8	4.6	4.3	3.9
4007	5.5	5.5	5.5	4.9	4.1	3.2	7.1	6.5	5.5	4.8	4.0	3.2
4009	7.2	7.2	7.2	6.5	5.6	4.8	8.9	8.2	7.2	6.5	5.6	4.8
4012	9.2	9.2	9.2	8.1	6.8	5.4	11.9	10.8	9.2	8.1	6.7	5.4
4018	14.8	14.8	14.8	13.1	11.0	8.9	17.5	17.3	14.8	13.1	11.0	8.9
4023	18.0	18.0	18.0	15.9	13.4	10.8	23.0	21.5	18.3	16.2	13.6	11.0
4031	24.0	24.0	24.0	21.2	17.7	14.1	31.0	28.2	24.0	21.1	17.6	14.1
4038	31.0	31.0	31.0	27.5	23.0	18.6	38.0	36.3	31.0	27.5	23.0	18.6
4044	39.0	39.0	39.0	34.5	29.0	23.4	44.0	43.6	37.5	33.5	28.4	23.4
4060	45.0	45.0	45.0	39.1	31.8	24.4	60.0	53.7	44.9	39.1	31.7	24.0
4075	60.0	60.0	60.0	53.1	44.6	36.0	75.0	73.8	62.9	55.6	46.5	37.0
4089	75.0	75.0	75.0	66.4	55.7	45.0	89.0	88.8	75.8	67.2	56.4	46.0
4103	91.0	91.0	91.0	80.6	67.6	54.6	103.0	103.0	90.3	80.1	67.3	55.0
4140	112.0	112.0	91.8	78.4	-	-	140.0	122.8	96.7	79.0	-	-
4168	150.0	150.0	123.0	105.0	-	-	168.0	150.5	124.4	107.0	-	-
4208	180.0	180.0	147.6	126.0	-	-	208.0	179.7	137.2	109.0	-	-
4250	216.0	216.0	177.1	151.2	-	-	250.0	221.8	179.4	151.0	-	-
4296	260.0	260.0	213.2	182.0	-	-	296.0	263.4	214.6	182.0	-	-
4371	304.0	304.0	249.3	212.8	-	-	371.0	327.2	261.6	218.0	-	-
4389	371.0	371.0	304.2	259.7	-	-	389.0	348.0	286.3	245.0	-	-
4453	414.0	345.7	-	-	-	-	453.0	349.0	-	-	-	-
4568	453.0	378.3	-	-	-	-	568.0	437.0	-	-	-	-
4675	605.0	505.2	-	-	-	-	675.0	529.0	-	-	-	-
4810	720.0	600.0	-	-	-	-	810.0	624.0	-	-	-	-
4930	810.0	675.0	-	-	-	-	930.0	716.0	-	-	-	-
4H11	930.0	775.0	-	-	-	-	1090.0	852.0	-	-	-	-
4H12	1090.0	908.0	-	-	-	-	1200.0	938.0	-	-	-	-

Table 5.5 Carrier Frequency and Rated Current Derating When A1-02 = 4 [AOLV] (< 460 V)

Model	Rated Current (A)									
	Heavy Duty Rating (HD1)					Normal Duty Rating (ND1)				
	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz
4002	1.8	1.8	1.3	1.0	0.6	2.1	1.8	1.6	1.4	1.2
4004	3.4	3.4	2.4	1.7	0.8	4.1	3.5	2.8	2.4	1.9
4005	4.8	4.8	3.8	3.0	2.1	5.4	4.9	4.3	3.9	3.5
4007	5.5	5.5	4.2	3.2	2.0	7.1	5.7	4.2	3.2	2.0
4009	7.2	7.2	5.8	4.8	3.5	8.9	7.4	5.8	4.8	3.5
4012	9.2	9.2	7.0	5.4	3.3	11.9	9.5	7.0	5.4	3.3
4018	14.8	14.8	11.4	8.9	5.7	17.5	15.2	11.4	8.9	5.7
4023	18.0	18.0	13.9	10.8	6.9	23.0	18.8	14.1	11.0	7.1

Model	Rated Current (A)									
	Heavy Duty Rating (HD1)					Normal Duty Rating (ND1)				
	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz
4031	24.0	24.0	18.4	14.1	8.8	31.0	24.7	18.3	14.1	8.8
4038	31.0	31.0	23.9	18.6	12.0	38.0	31.9	23.9	18.6	12.0
4044	39.0	39.0	30.1	23.4	15.0	44.0	38.5	29.5	23.4	15.8
4060	45.0	45.0	33.3	24.4	13.4	60.0	46.4	33.2	24.4	13.4
4075	60.0	60.0	46.3	36.0	23.1	75.0	64.7	48.4	37.5	23.8
4089	75.0	75.0	57.9	45.0	28.9	89.0	78.0	58.6	45.6	29.4
4103	91.0	91.0	70.2	54.6	35.1	103.0	92.8	69.9	54.6	35.5
4140	112.0	95.2	65.0	44.8	-	140.0	101.1	62.0	36.0	-
4168	150.0	127.5	87.0	60.0	-	168.0	128.7	89.5	63.0	-
4208	180.0	153.0	104.4	72.0	-	208.0	144.3	80.6	38.0	-
4250	216.0	183.6	125.3	86.4	-	250.0	186.5	123.0	81.0	-
4296	260.0	221.0	150.8	104.0	-	296.0	222.7	149.4	101.0	-
4371	304.0	258.4	176.3	121.6	-	371.0	272.5	174.0	108.0	-
4389	371.0	315.4	215.2	148.4	-	389.0	297.0	203.8	142.0	-
4453	414.0	259.8	-	-	-	453.0	219.0	-	-	-
4568	453.0	284.3	-	-	-	568.0	274.0	-	-	-
4675	605.0	379.6	-	-	-	675.0	345.0	-	-	-
4810	720.0	450.0	-	-	-	810.0	391.0	-	-	-
4930	810.0	506.0	-	-	-	930.0	449.0	-	-	-
4H11	930.0	581.0	-	-	-	1090.0	554.0	-	-	-
4H12	1090.0	681.0	-	-	-	1200.0	610.0	-	-	-

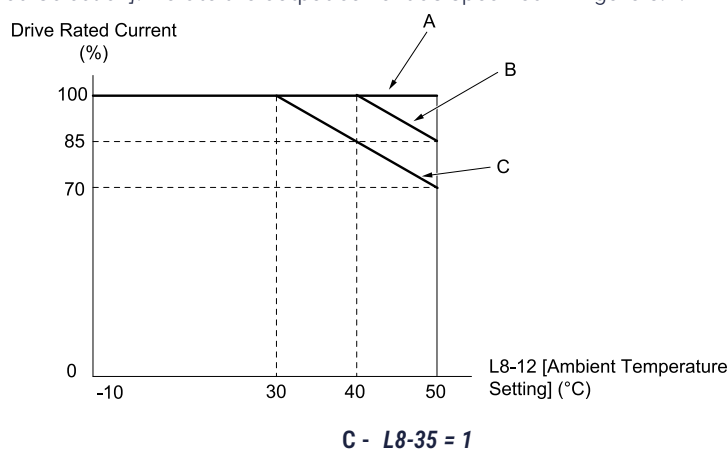
Table 5.6 Carrier Frequency and Rated Current Derating When A1-02 = 6 [AOLV/PM] (< 460 V)

Model	Rated Current (A)											
	Heavy Duty Rating (HD1)						Normal Duty Rating (ND1)					
	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz
4002	1.8	1.8	1.7	1.3	1.0	0.6	2.1	1.9	1.7	1.6	1.4	1.2
4004	3.4	3.4	3.2	2.4	1.7	1.0	4.1	3.7	3.3	2.8	2.4	2.0
4005	4.8	4.8	4.5	3.8	3.0	2.3	5.4	5.0	4.7	4.3	3.9	3.6
4007	5.5	5.5	5.2	4.2	3.2	2.3	7.1	6.1	5.2	4.2	3.2	2.3
4009	7.2	7.2	6.9	5.8	4.8	3.8	8.9	7.9	6.8	5.8	4.8	3.7
4012	9.2	9.2	8.7	7.0	5.4	3.8	11.9	10.3	8.6	7.0	5.4	3.8
4018	14.8	14.8	14.0	11.4	8.9	6.3	17.5	16.5	14.0	11.4	8.9	6.3
4023	18.0	18.0	17.0	13.9	10.8	7.7	23.4	20.4	17.3	14.1	11.0	7.8
4031	24.0	24.0	22.6	18.4	14.1	9.9	31.0	26.8	22.6	18.3	14.1	9.9
4038	31.0	31.0	29.2	23.9	18.6	13.3	38.0	34.5	29.2	23.9	18.6	13.3
4044	39.0	39.0	36.8	30.1	23.4	16.7	44.0	41.6	35.5	29.5	23.4	17.3
4060	45.0	45.0	42.1	33.3	24.4	15.6	59.6	50.8	42.0	33.2	24.4	15.6
4075	60.0	60.0	56.6	46.3	36.0	25.7	74.9	70.2	59.3	48.4	37.5	26.5
4089	75.0	75.0	70.7	57.9	45.0	32.1	89.2	84.5	71.5	58.6	45.6	32.7
4103	91.0	91.0	85.8	70.2	54.6	39.0	103.0	100.5	85.2	69.9	54.6	39.3
4140	112.0	105.3	85.1	65.0	44.8	-	140.0	114.1	88.1	62.0	36.0	-
4168	150.0	141.0	114.0	87.0	60.0	-	168.0	141.8	115.6	89.5	63.3	-
4208	180.0	169.2	136.8	104.4	72.0	-	208.0	165.5	123.1	80.6	38.1	-
4250	216.0	203.0	164.2	125.3	86.4	-	250.0	207.7	165.3	123.0	80.6	-

Model	Rated Current (A)											
	Heavy Duty Rating (HD1)						Normal Duty Rating (ND1)					
	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz
4296	260.0	244.4	197.6	150.8	104.0	-	296.0	247.1	198.3	149.4	100.6	-
4371	304.0	285.8	231.0	176.3	121.6	-	371.0	305.3	239.7	174.0	108.3	-
4389	371.0	348.7	282.0	215.2	148.4	-	389.0	327.5	265.7	203.8	142.0	-
4453	414.0	311.3	-	-	-	-	453.0	296.7	-	-	-	-
4568	453.0	340.7	-	-	-	-	568.0	372.0	-	-	-	-
4675	605.0	455.0	-	-	-	-	675.0	455.0	-	-	-	-
4810	720.0	540.0	-	-	-	-	810.0	531.0	-	-	-	-
4930	810.0	607.0	-	-	-	-	930.0	609.0	-	-	-	-
4H11	930.0	697.0	-	-	-	-	1090.0	733.0	-	-	-	-
4H12	1090.0	817.0	-	-	-	-	1200.0	807.0	-	-	-	-

5.2 Derating Depending on Ambient Temperature

When you install drives in a place where ambient temperatures are higher than the rated conditions or install drives side-by-side in the enclosure panel, set *L8-12 [Ambient Temperature Setting]* and *L8-35 [Installation Method Selection]*. Derate the output current as specified in Figure 5.1.



A - L8-35 = 0

B - L8-35 = 2, L8-35 = 3

C - L8-35 = 1

Figure 5.1 Derating Depending on Drive Installation Method

5.3 Altitude Derating

Install the drive in a location that has an altitude of 1000 m (3281 ft) or lower.

Derate the output current by 1% for each 100 m (328 ft) to install the drive in altitudes between 1000 to 4000 m (3281 to 13123 ft).

It is not necessary to derate the rated voltage in these conditions:

- Installing the drive at 2000 m (6562 ft) or lower
- Installing the drive between 2000 to 4000 m (6562 to 13123 ft) and grounding the neutral point on the power supply.
If you do not ground the drive with a neutral network, contact Yaskawa or your nearest sales representative.

Built-in EMC Filters

Note:

The EMC filters are disabled by default.

6.1 400 V Class

Table 6.1 Built-in EMC Filter (400 V Class)

Model GA70Cxxxx	IEC61800-3 Category	Cable Length *1	Leakage Current *2
4002	C3	10 m	36.35 mA
4004	C3	10 m	36.35 mA
4005	C3	10 m	36.35 mA
4007	C3	10 m	36.35 mA
4009	C3	10 m	36.35 mA
4012	C3	10 m	36.35 mA
4018	C3	10 m	36.35 mA
4023	C3	10 m	36.35 mA
4031	C3	10 m	36.35 mA
4038	C3	10 m	36.35 mA
4044	C3	10 m	149.31 mA
4060	C3	10 m	149.31 mA
4075	C3	10 m	149.31 mA
4089	C3	10 m	170.25 mA
4103	C3	10 m	170.25 mA
4140	C3	10 m	170.25 mA
4168	C3	10 m	170.25 mA
4208	C3	10 m	196.85 mA
4250	C3	10 m	196.85 mA
4296	C3	10 m	196.85 mA
4371	C3	10 m	196.85 mA
4389	C3	10 m	196.85 mA
4453	C3	10 m	196.85 mA
4568	C3	10 m	196.85 mA
4675	C3	10 m	196.85 mA

*1 Shielded Motor Cable, at Default Switching Frequency

*2 Leakage currents shown here are calculated and for the EMC filter only. Values in real applications can vary depending on factors like phase voltage imbalance, grounding etc.

Electrical Connections

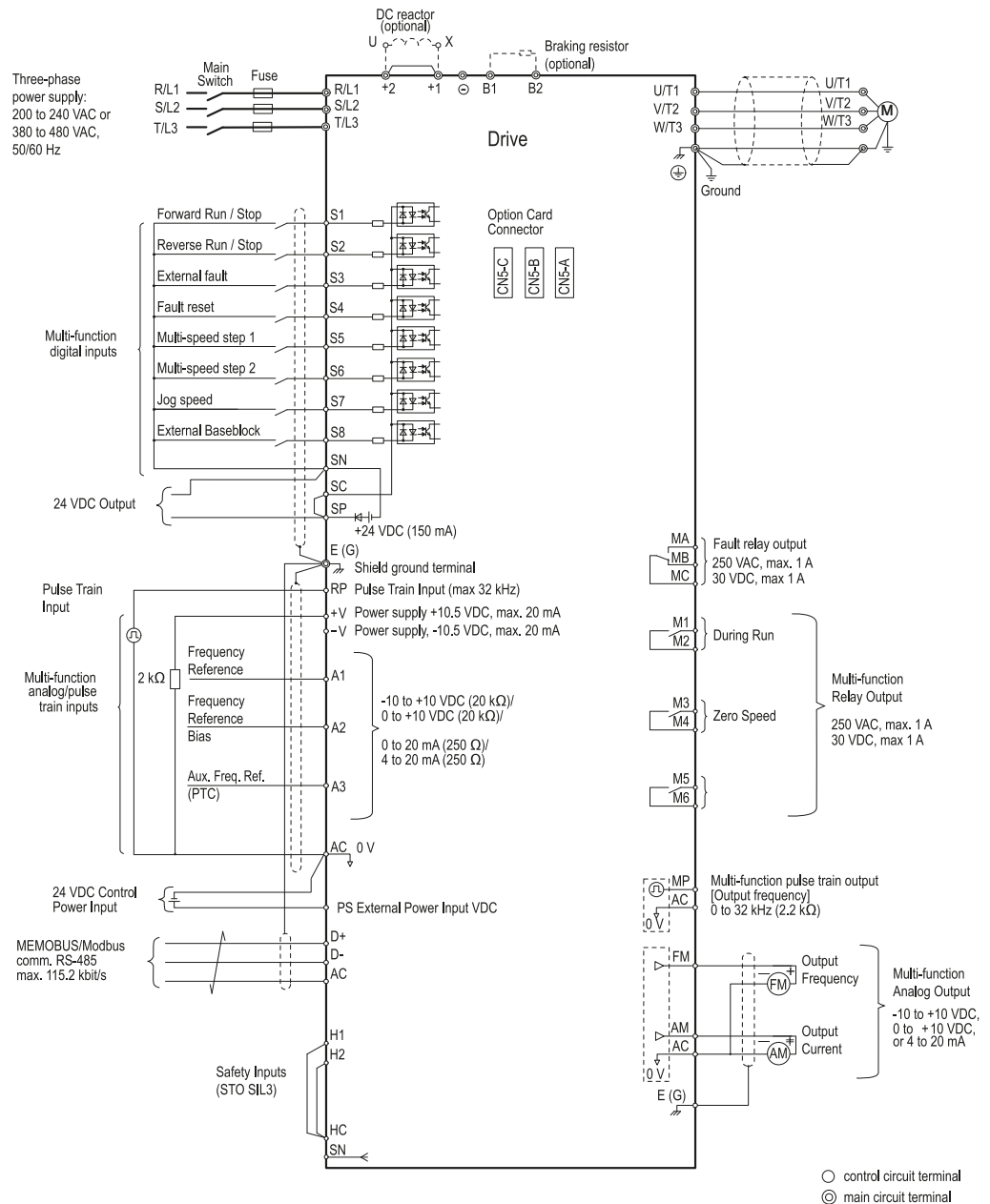


Figure 7.1 Standard Drive Connection Diagram

For more details check GA700 Technical Manual, chapter 3 “Electrical Installation”.

Dimensions & Weight

8.1 2004 - 2042, 4002 - 4023

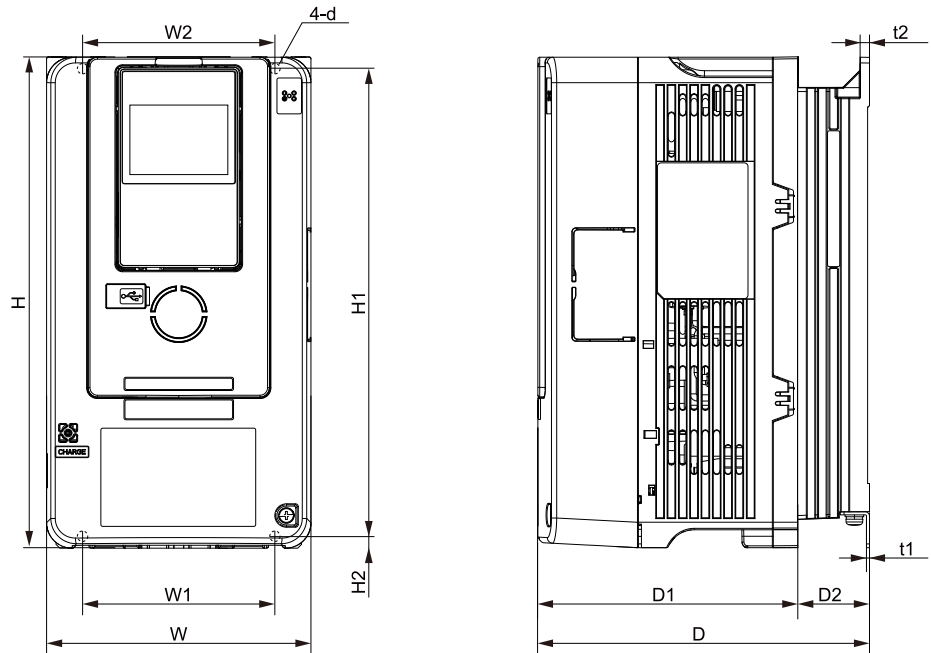


Figure 8.1 Dimension Diagram 1

Table 8.1 Three-Phase 200 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2004	140	260	176	138	38	3.5
2006	140	260	176	138	38	3.5
2010	140	260	176	138	38	3.5
2012	140	260	176	138	38	3.5
2018	140	260	211	138	73	3.8
2021	140	260	211	138	73	3.8
2030	140	260	211	138	73	4.2
2042	140	260	211	138	73	4.2

Table 8.2 Three-Phase 400 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4002	140	260	176	138	38	3.4
4004	140	260	176	138	38	3.4
4005	140	260	176	138	38	3.4
4007	140	260	211	138	73	3.7

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4009	140	260	211	138	73	3.7
4012	140	260	211	138	73	3.7
4018	140	260	211	138	73	4.0
4023	140	260	211	138	73	4.0

8.2 2056, 4031, 4038

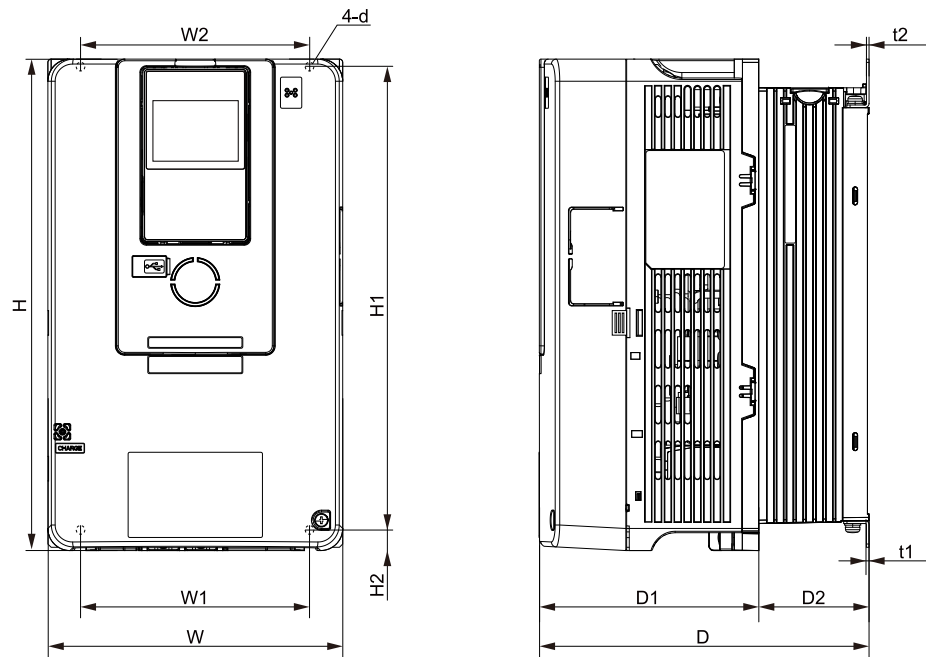


Figure 8.2 Dimension Diagram 2

Table 8.3 Three-Phase 200 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2056	180	300	202	134	68	6

Table 8.4 Three-Phase 400 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4031	180	300	202	134	68	5.5
4038	180	300	202	134	68	5.5

8.3 2070, 2082, 4044, 4060

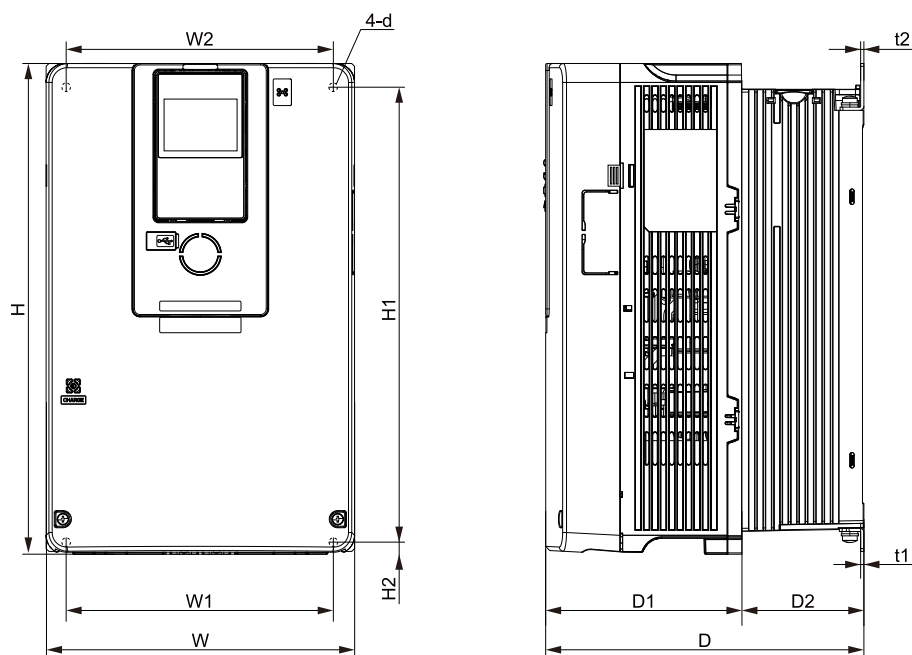


Figure 8.3 Dimension Diagram 3

Table 8.5 Three-Phase 200 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2070	220	350	227	140	87	8.5
2082	220	350	227	140	87	9.5

Table 8.6 Three-Phase 400 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4044	220	350	227	140	87	8
4060	220	350	246	140	106	13

8.4 2110, 4075

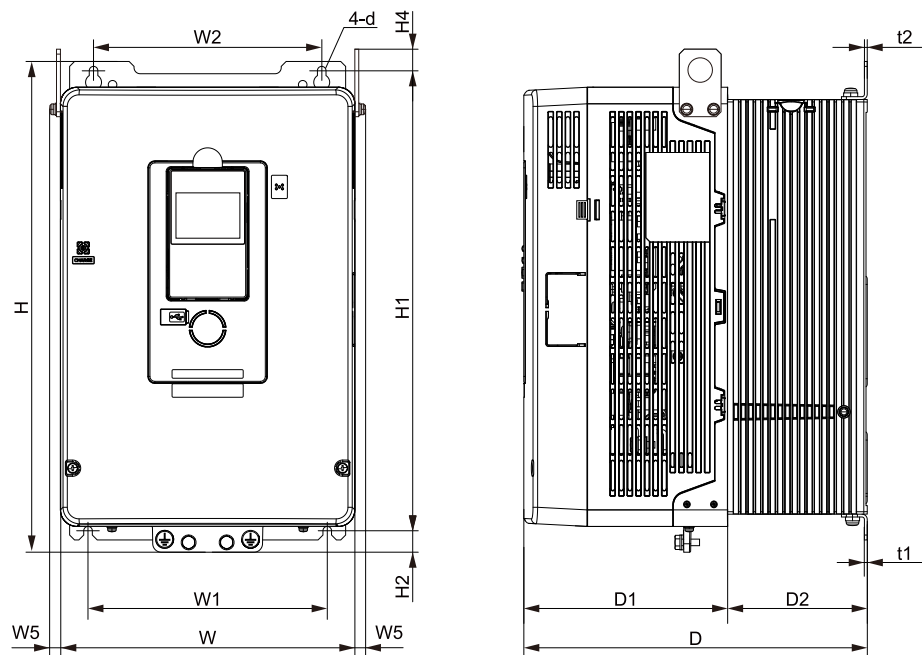


Figure 8.4 Dimension Diagram 4

Table 8.7 Three-Phase 200 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2110	240	400	280	166	114	18

Table 8.8 Three-Phase 200 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2110	240	400	280	166	114	19

Table 8.9 Three-Phase 400 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4075	240	400	280	166	114	15

8.5 2138, 4089, 4103

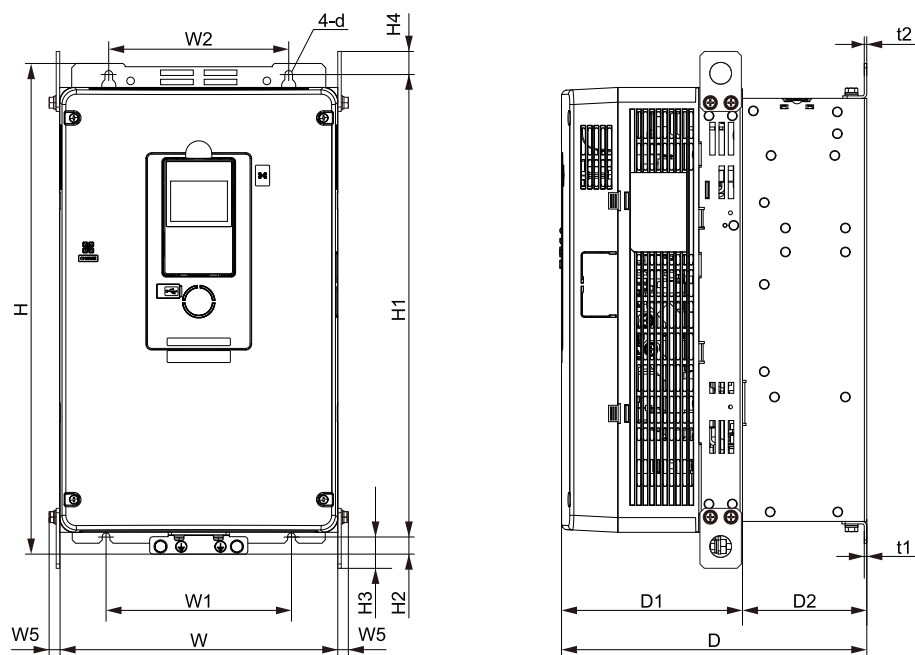


Figure 8.5 Dimension Diagram 5

Table 8.10 Three-Phase 200 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2138	255	450	280	166	114	21

Table 8.11 Three-Phase 200 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2138	255	450	280	166	114	22

Table 8.12 Three-Phase 400 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4089	255	450	280	166	114	20
4103	255	450	280	166	114	24

Table 8.13 Three-Phase 400 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4089	255	450	280	166	114	21
4103	255	450	280	166	114	25

8.6 2169, 2211, 4140, 4168

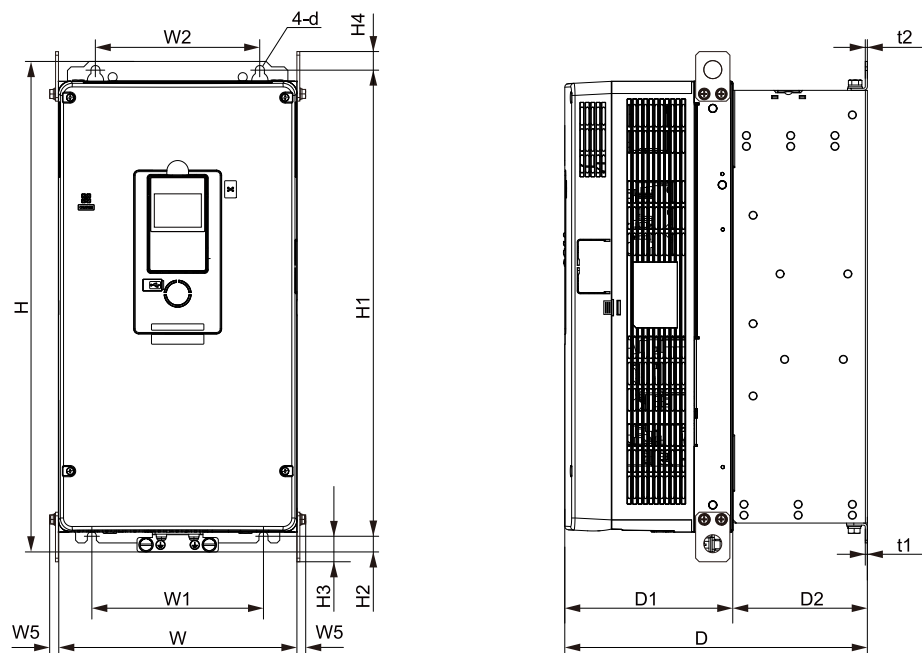


Figure 8.6 Dimension Diagram 6

Table 8.14 Three-Phase 200 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2169	264	543	335	186	149	34
2211	264	543	335	186	149	35

Table 8.15 Three-Phase 200 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2169	264	543	335	186	149	35
2211	264	543	335	186	149	36

Table 8.16 Three-Phase 400 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4140	264	543	335	186	149	36
4168	264	543	335	186	149	37

Table 8.17 Three-Phase 400 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4140	264	543	335	186	149	37
4168	264	543	335	186	149	38

8.7 2257, 2313, 4208 to 4296

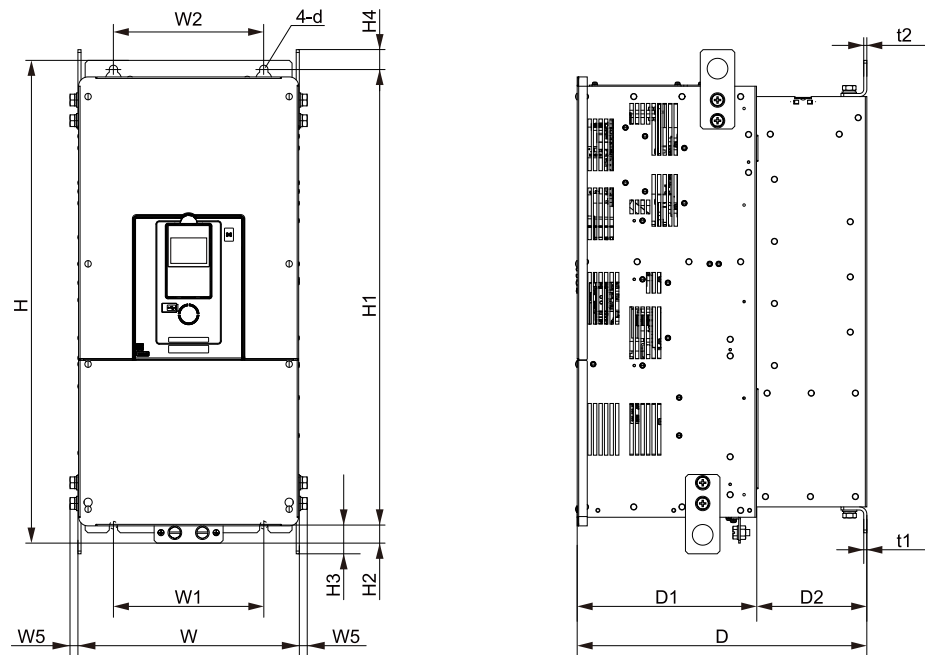


Figure 8.7 Dimension Diagram 7

Table 8.18 Three-Phase 200 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2257	312	700	420	260	160	58
2313	312	700	420	260	160	61

Table 8.19 Three-Phase 200 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2257	312	700	420	260	160	59
2313	312	700	420	260	160	61

Table 8.20 Three-Phase 400 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4208	312	700	420	260	160	60
4250	312	700	420	260	160	62
4296	312	700	420	260	160	65

Table 8.21 Three-Phase 400 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4208	312	700	420	260	160	61
4250	312	700	420	260	160	63
4296	312	700	420	260	160	66

8.8 2360, 2415, 4371, 4389

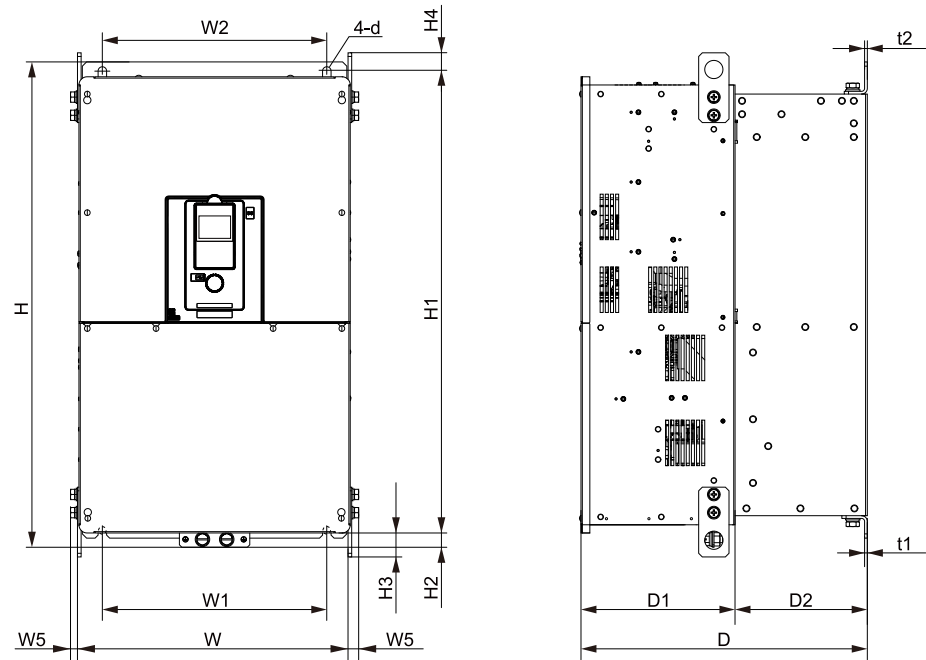


Figure 8.8 Dimension Diagram 8

Table 8.22 Three-Phase 200 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2360	440	800	472	254	218	100
2415	440	800	472	254	218	106

Table 8.23 Three-Phase 200 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
2360	440	800	472	254	218	106
2415	440	800	472	254	218	112

Table 8.24 Three-Phase 400 V Class (IP20, No Internal EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4371	440	800	472	254	218	106
4389	440	800	472	254	218	112

Table 8.25 Three-Phase 400 V Class (IP20, with Built-in EMC Filter)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4371	440	800	472	254	218	111
4389	440	800	472	254	218	117

8.9 4453 - 4675

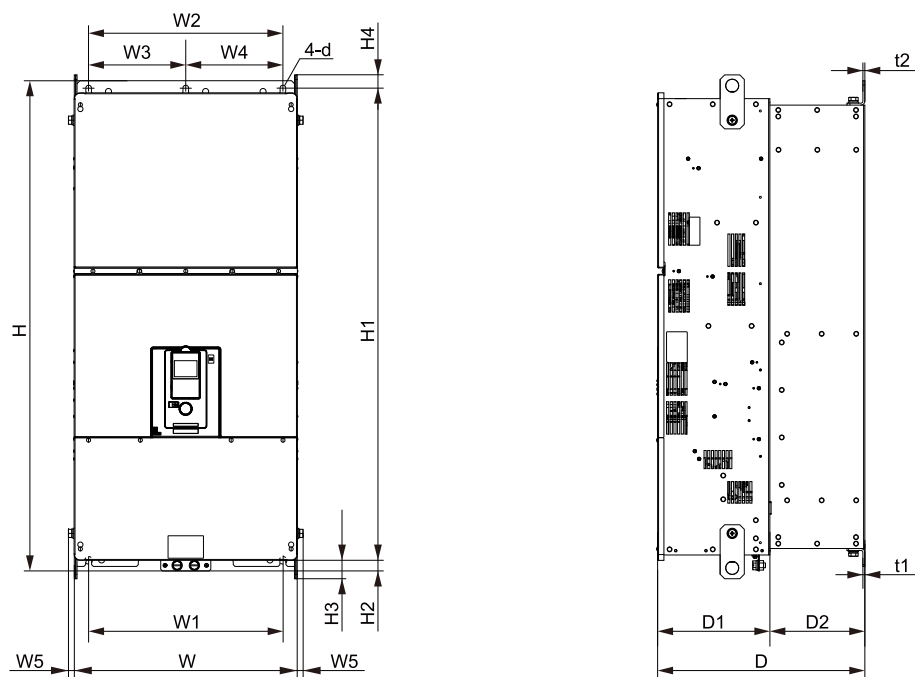


Figure 8.9 Dimension Diagram 9

Table 8.26 Three-Phase 400 V Class (IP20)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4453	510	1136	480	260	220	198
4568	510	1136	480	260	220	198
4675	510	1136	480	260	220	207

8.10 4810 - 4H12

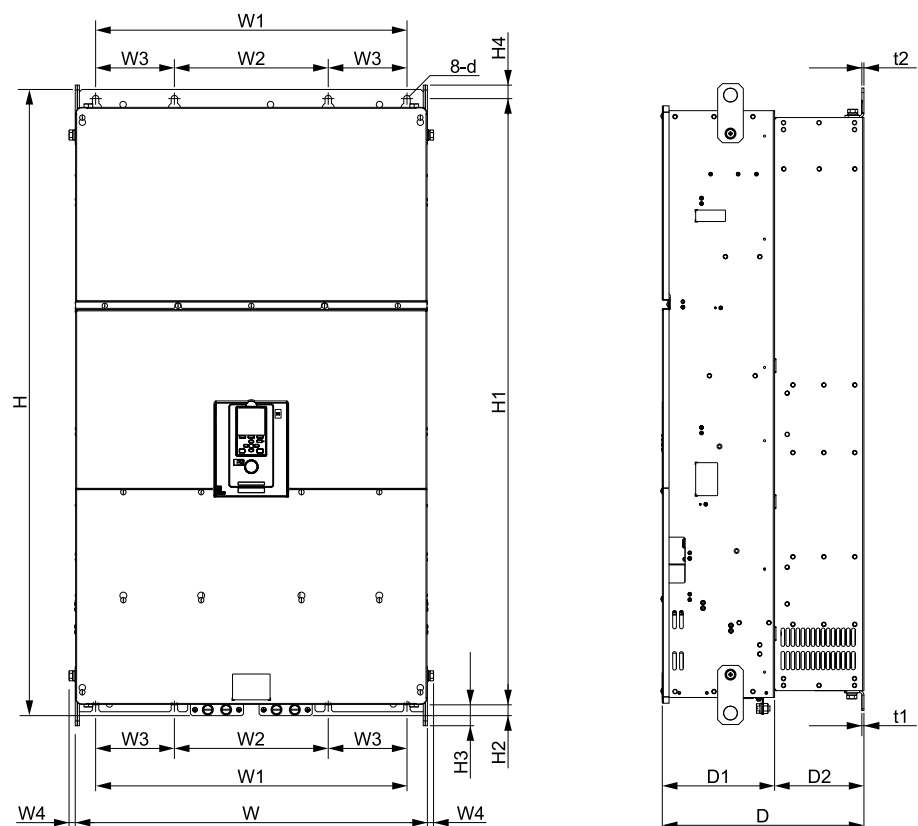


Figure 8.10 Dimension Diagram 10

Table 8.27 Three-Phase 400 V Class (IP00)

Model	Dimensions mm					Est. Weight kg
	W	H	D	D1	D2	
4810	760	1367.5	440	245	195	363
4930	760	1367.5	440	245	195	363
4H11	760	1367.5	440	245	195	368
4H12	760	1367.5	440	245	195	368

Accessories & Power Options

9.1 Network Communications Option Cards

Table 9.1 Option

Name		Model	SAP #
Multi-protocol Ethernet Option		JOHB-SMP3	10109077
PROFIBUS-DP		SI-P3	500-029-593
CANopen		SI-S3	100-046-870
CC-Link		SI-C3	10062651

Note:

The Multi-Protocol Ethernet option card (JOHB-SMP3) is a single circuit board option card for Yaskawa AC drives that contains multiple Ethernet protocols.

- Modbus TCP/IP



- EtherNet/IP



- PROFINET



- EtherCAT



- BACnet/IP



9.2 Options

Motor Feedback Options

By installing the PG-B3 option card to a drive, the drive is able to read a feedback signal send from a pulse generator (PG of 50 kHz) attached to the motor. This PG signal lets the drive know about any subtle variations in the load, and provides the drive with the data necessary for controlling the output frequency to maintain constant speed with a high degree of accuracy.

By installing the PG-X3 option card to a drive, the drive is able to read a feedback signal send from a pulse generator (PG of 300 kHz) attached to the motor. This PG signal lets the drive know about any subtle variations in the load, and provides the drive with the data necessary for controlling the output frequency to maintain constant speed with a high degree of accuracy.

The PG-F3 option enabled the drive to detect motor rotation speed from the pulse generator as feedback, and is intended for use with the CLV/PM control method. The drive can then enable control of the output frequency keep a constant motor speed. EnDat 2.1/01, EnDat 2.2/01, EnDat 2.2/22 models from HEIDENHAIN are supported. HIPERFACE models from SICK STEGMANN are supported. The maximum input frequency is 20 kHz (use for low-speed applications, for example gearless motors).

The PG-RT3 option enables the user to connect to a resolver that meets Yaskawa's specifications such as the TS2640N321E64 made by Tamagawa Seiki Co., Ltd. This option facilitates motor speed feedback to the drive and takes advantage of Closed Loop Vector control for PM Motors. The option increases control accuracy and performance.

Table 9.2 Motor Feedback Options

Name	Model	SAP #
Complementary Type PG	PG-B3	10062639
Motor PG feedback line driver interface	PG-X3	100-046-872
Encoder Type (EnDat)	PG-F3	100-067-860
Resolver Interface	PG-RT3	100-056-648

I/O Options

AI-A3 allows to input a high resolution analog signal to the drive. The option card terminals can be set up in two ways. Separate functions for each terminal: Use the multi-function analog input terminals on the option card instead of the drive analog input terminals for a higher resolution signal. Combined input: The drive adds all signals input to the option card terminals to build the frequency reference.

AO-A3 expands the number of analog outputs used to monitor drive performance (output frequency, output current, etc.). The channel functions gain and bias can easily be adjusted by drive parameters.

DI-A3 is used to set the speed reference using binary coded digital inputs.

DO-A3 expands the number of digital outputs used to monitor drive operation status (alarm signals, zero speed detection, etc.). This option card provides 8 outputs: 6 photocoupler outputs and 2 relay outputs.

Table 9.3 I/O Options

Name	Model	SAP #
Analog input	AI-A3	100-046-873
Analog Monitor	AO-A3	100-046-874
Digital input	DI-A3	100-046-875
Digital Output	DO-A3	100-046-875

9.3 LED/LCD Keypads

LCD Keypad

LCD keypad greatly improves the operability of the drive. The high-res screen can display graphics and multi-language full text. Additional functions are: Start-up Wizard, copy function (4 sets of parameters), backup, data logging, realtime clock.



Description	Model	SAP #
LCD Keypad	JVOP-KPLCA04AEA	10105769

LED Keypad

This optional LED keypad provides a larger LED display (5 digits, 7 segments) and larger navigation buttons for more comfort during drive operation.

Description	Model	SAP #
LED Keypad	JVOP-KPLEA04AAA	10010185

9.4 Extension Cables

Description	Appearance	Model	SAP #
Keypad Remote Mount Cable - 1 Meter		WV001-YEG	10007058
Keypad Remote Mount Cable - 3 Meter		WV003-YEG	10012366

9.5 PC Connection Cable (USB)

Description	Model	SAP #
USB-mini connection cable for PC 2.5m	JZSP-CVS06-02-E	300-100-888

9.6 Keypad Door Mounting Kits

Door Mounting Kits for LCD Keypads (with or without Bluetooth)

The LCD keypads can be mounted to a panel front door using one of the mounting kits below.

Description	Appearance	Model	SAP #
Brackets have tapped holes for use with screws Type 1 Keypad Panel Mount Kit A		900-192-933-001	10090514
Brackets have untapped holes for use with panel studs Type 1 Keypad Panel Mount Kit B		900-192-933-002	10090515
With embedded studs Remote Keypad Mounting Kit for LCD/LED Keypad JVOP-KPLx, IP55/UL Type 12		900-239-230-001	10108053

Other Mounting Kits

Description	Compatible Drive Model	Model	SAP #
UL Type 1 Kit	2004, 2006, 2010, 2012, 2018, 2021, 2030, 2042, 4002, 4004, 4005, 4007, 4009, 4012, 4018, 4023	100-192-121-001	100-202-326
	2056, 4031, 4038	100-192-121-002	100-202-327
	2070, 4044, 4060	100-192-121-003	10101787
	2082	100-192-121-004	10101788
	2110, 4075	100-192-121-005	10101789
	2138, 4089, 4103	100-192-121-006	10101790
	2169, 4140, 4168	100-192-121-007	10101791
	2211	100-192-121-008	10101792
	2257, 2313, 4208, 4250, 4296	100-192-121-009	10101793
	2360, 2415, 4371, 4389	100-192-121-010	10101794
Heatsink Out The Back Mounting Kit	2004 - 2042, 4002 - 4023	900-193-209-001	100-203-229
	2056, 4031 - 4038	900-193-209-002	100-203-230
	2070 - 2082, 4044 - 4060	900-193-209-003	100-203-231
Cable Shield Clamp Kit	2004 - 2042, 4002 - 4038	900-195-896-001	100-206-983
	2056, 4031 - 4038	900-195-896-002	100-206-984

9.7 External EMC Filters

9.7.1 400 V Class

EMC Filter for up to 40 °C

Table 9.4 External EMC Filter (400 V Class)

Model GA70Cxxxx	EMC Filter		EMC Performance (EMC Limit/Motor Cable Length)		Foot mount										
	Filter Model	SAP #	Drive without integrated EMC Filter	Drive with Inte- grated EMC Filter Switched ON											
4002BBA	FB-40008B	10099582	C1 / 25 m C2 / 100 m	C1 / 100 m C2 / 300 m	Yes										
4004BBA															
4005BBA															
4007BBA															
4009BBA	FB-40014B	10099583			C1 / 100 m C2 / 300 m	C1 / 100 m C2 / 300 m	Yes								
4012BBA							Yes								
4018BBA	FB-40025B	10099584					C1 / 100 m C2 / 300 m	C1 / 100 m C2 / 300 m	Yes						
4023BBA									Yes						
4031BBA	FB-40044B	10099585							C1 / 100 m C2 / 300 m	C1 / 100 m C2 / 300 m	Yes				
4038BBA											Yes				
4044BBA	FB-40060A	10002292	C2 / 100 m	C1 / 100 m C2 / 300 m							No				
4060BBA											No				
4075BBA	FB-40072A	10002294									No				
4089BBA	FB-40105A	10002295									C2 / 100 m	C1 / 100 m C2 / 300 m	No		
4103BBA					No										
4140BBA	FB-40170A	10002296			C2 / 100 m	C1 / 100 m C2 / 300 m							No		
4168BBA							No								
4208BBA	FB-40250A	10002297					C2 / 100 m	C1 / 100 m C2 / 300 m					No		
4250BBA									No						
4296BBA	FB-40414A	10009801							C2 / 100 m	C1 / 100 m C2 / 300 m			No		
4371BAA													No		
4389BAA													No		
4453BAA	FB40675A	10009802											C2 / 100 m	C1 / 100 m C2 / 300 m	No
4568BAA															No
4675BAA															No
4810BAA	FB-41200A or 2x FB-40675A	10009803 or 10009802	C2 / 50 m or C2 / 100 m	C1 / 100 m C2 / 300 m											No
4930BAA															
4H11BAA															
4H12BAA															

EMC Filter for up to 50 °C

Table 9.5 Built-in EMC Filter (400 V Class)

Model GA70Cxxxx	EMC Filter		EMC Performance (EMC Limit/Motor Cable Length)		Foot mount				
	Model	SAP #	Drive without integrated EMC Filter	Drive with Inte- grated EMC Filter Switched ON					
4002BBA	FB-40008A	10002287	C1 / 25 m C2 / 100 m	C1 / 100 m C2 / 300 m	Yes				
4004BBA									
4005BBA									
4007BBA	FB-40014A	10002288			C1 / 25 m C2 / 100 m	C1 / 100 m C2 / 300 m	Yes		
4009BBA									
4012BBA									
4018BBA	FB-40025A	10002289					C1 / 25 m C2 / 100 m	C1 / 100 m C2 / 300 m	Yes
4023BBA									
4031BBA									
4038BBA	FB-40044A	10002291	C1 / 25 m C2 / 100 m	C1 / 100 m C2 / 300 m					Yes
4044BBA									
4060BBA									
4075BBA	FB-40060A	10002292			C2 / 100 m	C1 / 100 m C2 / 300 m			No
4089BBA									
4103BBA									
4140BBA	FB-40072A	10002294					C2 / 100 m	C1 / 100 m C2 / 300 m	No
4168BBA									
4208BBA									
4250BBA	FB-40105A	10002295	C2 / 100 m	C1 / 100 m C2 / 300 m					No
4296BBA									
4371BAA									
4389BAA	FB-40170A	10002296			C2 / 100 m	C1 / 100 m C2 / 300 m			No
4453BAA									
4568BAA									
4675BAA	FB-40250A	10002297					C2 / 100 m	C1 / 100 m C2 / 300 m	No
4810BAA									
4930BAA									
4H11BAA	FB-40414A	10009801	C2 / 50 m or C2 / 100 m	C1 / 100 m C2 / 300 m					No
4H12BAA									
	FB-40675A	10009802			C2 / 50 m or C2 / 100 m	C1 / 100 m C2 / 300 m			No
	FB-41200A or 2× FB-40675A	10009803 or 10009802					C2 / 50 m or C2 / 100 m	C1 / 100 m C2 / 300 m	No

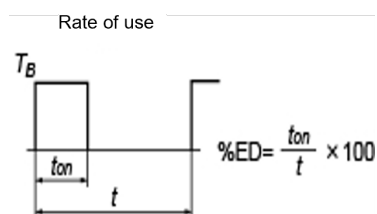
9.8 Braking Resistors

Table 9.6 Braking Resistors (400 V Class) Heavy Duty

Model GA70Cxxxx	HD						Minimum Resistor Ω
	Braking Unit		Resistor 40% ED		Resistor 10% ED		
	CDBR-	SAP #	Model	SAP #	Model	SAP #	
4002BBA	Built-in		RH-0260W270	10004345	RH-0260W270	10004345	165
4004BBA							165
4005BBA							110
4007BBA							110
4009BBA			RH-0520W120	10004347	RH-0520W120	10004347	55
4012BBA							55
4018BBA			RH-0780W040	10004348	RH-0780W040-10	10011431	32
4023BBA							32
4031BBA			RH-1560W040	10004350	RH-1560W040-10	10011438	20
4038BBA			RH-4800W022	10004353	RH-4800W022-10	10004354	20
4044BBA							19.2
4060BBA			RH-6000W022	10004356	RH-6000W022-10	10011456	19.2
4075BBA							19.2
4089BBA			RH-9600W015	10004358	RH-9600W015-10	10011463	10.6
4103BBA							8.7
4140BBA			2× RH-6000W022	10004356	2× RH-6000W022-10	10011456	7.2
4168BBA			2× RH-9600W015	10004358	2× RH-9600W015-10	10011463	5.2
4208BBA	2x 4045D	100-091-723	2× RH-9600W015	10004358	2× RH-9600W015-10	10011463	13
4250BBA	4220D	100-091-526	-		RH-29000W3P8-10	10011443	3.2
4296BBA							
4371BAA							
4389BAA							
4453BAA							
4568BAA							
4675BAA	2x 4220D	100-091-526	-		2× RH-29000W3P8-10	10011443	3.2
4810BAA	For more information, contact your nearest Yaskawa representative.						
4930BAA							
4H11BAA							
4H12BAA							

Table 9.7 Braking Resistors (400 V Class) Normal Duty

Model GA70Cxxxx	ND						Minimum Resistor Ω						
	Braking Unit		Resistor 40% ED		Resistor 10% ED								
	CDBR-	SAP #	Model	SAP #	Model	SAP #							
4002BBA	Built-in		RH-0260W270	10004345	RH-0260W270	10004345	165						
4004BBA							165						
4005BBA							110						
4007BBA							110						
4009BBA			RH-0520W120	10004347	RH-0520W120	10004347	55						
4012BBA							55						
4018BBA			RH-0780W040	10004348	RH-0780W040-10	10011431	32						
4023BBA			RH-1560W040	10004350	RH-1560W040-10	10011438	32						
4031BBA							20						
4038BBA			RH-4800W022	10004353	RH-4800W022-10	10004354	20						
4044BBA							19.2						
4060BBA			RH-6000W022	10004356	RH-6000W022-10	10011456	19.2						
4075BBA							19.2						
4089BBA			RH-9600W015	10004358	RH-9600W015-10	10011463	10.6						
4103BBA							8.7						
4140BBA			2× RH-6000W022	10004356	2× RH-6000W022-10	10011456	7.2						
4168BBA			2× RH-9600W015	10004358	2× RH-9600W015-10	10011463	5.2						
4208BBA	2× 4045D	100-091-723	2× RH-9600W015	10004358	2× RH-9600W015-10	10011463	13						
4250BBA	4220D	100-091-526	-		RH-29000W3P8-10	10011443	3.2						
4296BBA													
4371BAA													
4389BAA													
4453BAA	2× 4220D	100-091-526	-		2× RH-29000W3P8-10	10011443	3.2						
4568BAA													
4675BAA													
4810BAA	For more information, contact your nearest Yaskawa representative.												
4930BAA													
4H11BAA													
4H12BAA													

Note:10% ED : 120 s cycle time (t) and 12 s switch on time (t_{on})40% ED : 120 s cycle time (t) and 48 s switch on time (t_{on})**Note:**

The order code for the resistors consists of the rated power and the resistance value of the resistor.

Example: RH0260W270 means 260 W, 270 Ohms.

9.9 AC Input Reactors

4% uk

Table 9.8 AC Input Reactors (400 V Class)

Model GA70Cxxxx	IP00		IP20 Option Box	
	AC Input Reactor Model	SAP #	Option Box Model	SAP #
4002BBA	LR3 40-4/4	10011015	IP20-Box32	10062614
4004BBA	LR3 40-4/6	10011019		
4005BBA	LR3 40-4/10	10011004		
4007BBA				
4009BBA	LR3 40-4/16	10011007		
4012BBA				
4018BBA	LR3 40-4/25	10011012	IP20-Box33	10062615
4023BBA	LR3 40-4/45	10011017	IP20-Box35	10062617
4031BBA				
4038BBA	LR3 40-4/63	10003639	IP20-Box36	10062618
4044BBA				
4060BBA				
4075BBA	LR3 40-4/90	10011023	IP20-Box39	10062621
4089BBA				
4103BBA	LR3 40-4/115	10011005	IP20-Box41	10062623
4140BBA	LR3 40-4/160	10003637		
4168BBA	LR3 40-4/200	10011011		
4208BBA	LR3 40-4/250	10011013	IP20-Box44	10062626
4250BBA				
4296BBA	LR3 40-4/300	10003638		
4371BAA	LR3 40-4/400	10011016		
4389BAA	LR3 40-4/500	10011018	IP20-Box45	10062627
4453BAA				
4568BAA	LR3 40-4/710	10011022	IP20-Box46	10062628
4675BAA				
4810BAA	LR3 40-4/1200	10011006		
4930BAA				
4H11BAA				
4H12BAA				

9.10 Output Reactors

Up to 120 Hz Output
Frequency

Table 9.9 Output Reactors (400 V Class)

Model GA70Cxxxx	IP00 New		IP20 Option Box	
	Output Reactor Model	SAP #	Output Reactor Model	SAP #
4002BBA	MDB 400/6,3	10011058	IP20-Box31	10062613
4004BBA				
4005BBA				
4007BBA	MDB 400/13	10011050	IP20-Box32	10062614
4009BBA				
4012BBA				
4018BBA	MDB 400/24	10011052	IP20-Box36	10062618
4023BBA	MDB 400/24 or MDB 400/46 *1	10011052 or 10011057	IP20-Box36 or P20-Box37	10062618 or 10062619
4031BBA	MDB 400/46	10011057	IP20-Box37	10062619
4038BBA				
4044BBA				
4060BBA	MDB 400/72	10011061		
4075BBA				
4089BBA	MDB 400/110	10011048	IP20-Box39	10062621
4103BBA				
4140BBA	MDB 400/176	10011051	IP20-Box41	10062623
4168BBA				
4208BBA	MDB 400/250	10011053		
4250BBA				
4296BBA	MDB 400/380	10011054		
4371BAA				
4389BAA	MDB 400/430	10011056	IP20-Box45	10062627
4453BAA	MDB 400/700	10011060		
4568BAA				
4675BAA				
4810BAA	MDB 400/1200	10011049	IP20-Box46	10062628
4930BAA				
4H11BAA				
4H12BAA				

*1 When you use 8 kHz, select MDB 400/46.

Up to 50 Hz Output
Frequency

Table 9.10 Output Reactors (400 V Class)

Model GA70Cxxxx	IP00 Old / New		IP20 Option Box	
	Output Reactor Model	SAP #	Output Reactor Model	SAP #
4002BBA	MR3 400/4	10011067	IP20-Box31	10062613
4004BBA	MR3 400/10	10011063	IP20-Box32	10062614
4005BBA				
4007BBA				
4009BBA				
4012BBA				
4018BBA	MR3 400/24	10011065		
4023BBA	MR3 400/24 or MR3 400/37 *1	10011065 or 10011066	IP20-Box32 or IP20-Box33	10062614 or 10062615
4031BBA	MR3 400/48	10011068	IP20-Box35	10062617
4038BBA				
4044BBA				
4060BBA	MR3 400/61	10011069		
4075BBA	use 120 Hz type		use 120 Hz type	
4089BBA				
4103BBA				
4140BBA				
4168BBA				
4208BBA				
4250BBA				
4296BBA				
4371BAA				
4389BAA				
4453BAA				
4568BAA				
4675BAA				
4810BAA				
4930BAA				
4H11BAA				
4H12BAA				

*1 When you use 8 kHz, select MR3 400/37.

Limitations

Carrier frequency: 8 kHz
 Motor cable screened: 100 m screen
 Motor cable not screened: 150 m no screen
 Power supply: 200 V, 3-phase possible

9.11 Sine Filters

4% uk

Table 9.11 Sine Filters (400 V Class)

Model GA70Cxxxx	IP00		IP20 Option Box	
	Sine Filter Model	SAP #	Option Box Model	SAP #
4002BBA	SB-40004A-IP00	10102908	IP20-Box34	10062616
4004BBA				
4005BBA	SB-40010A-IP00	10101176	IP20-Box33	10062615
4007BBA				
4009BBA				
4012BBA	SB-40017A-IP00	10102909	IP20-Box41	10062623
4018BBA	SB-40024A-IP00	10004518		
4023BBA				
4031BBA	SB-40037A-IP00	10098883		
4038BBA				
4044BBA	SB-40061A-IP00	10011525	IP20-Box44	10062626
4060BBA				
4075BBA	SB-40072A-IP00	10004519	IP20-Box45	10062627
4089BBA	SB-40115A-IP00	10102910		
4103BBA				
4140BBA	SB-40180A-IP00	10099323		
4168BBA				
4208BBA	SB-40250A-IP00	10102911	IP20-Box46	10062628
4250BBA				
4296BBA	SB-40414A-IP00	10011527		
4371BAA				
4389BAA				
4453BAA	SB-40515A-IP00	10109096		
4568BAA	SB-40675A-IP00	10105183		
4675BAA				
4810BAA	SR-40800A-00	10012201	On Request	
4930BAA	SR-41000A-00	10012202		
4H11BAA	SR-41200A-00	10012203		
4H12BAA				

Limitations

Carrier frequency: 2 kHz - 8 kHz

Motor cable screened:

Motor cable not screened: 300 m no screen

GA700 Online Information

Certifications, Declarations

The latest version of GA700 product certification/declaration can be downloaded from Yaskawa website.

Use the link [Download Center](#) to access Yaskawa document downloads. Enter the search term “GA700” and change the Document Type to “Certification” for declaration and certification files.

Enter name, description, product or keywords	Document Type	Language	
GA700	Certification	All	Apply
Name	Document Type	Language	
GA700 AC Drives EU Declaration of Conformity 07/2023 Low Voltage Directive, Electromagnetic Compatibility Directive, Machine Directive, RoHS, Certificate No. EZZ024672<1> issued July 20, 2023	Certification	Czech, Danish, Dutch, English, Finnish, French, German, Italian, Polish, Slovenian, Spanish, Swedish	
GA700 AC Drives UKCA Declaration of Conformity 07/2023 EZZ024540 issued July 20, 2023	Certification	English	
GA700 GA800 CH700 CR700 ACMA Declaration of Conformity Radiocommunications (Electromagnetic Compatibility) Standard: 2017 (AS/NZS CISPR 32:2015)	Certification	English	
GA700 GA800 CH700 CR700 LA700 TÜV Safety Certification 10/2025 TÜV Certification AC Drive Serie GA700 GA800 CH700 CR700 LA700, IEC 61508-1:2010 IEC 61508-2:2010 IEC 61508-3:2010 EN 61508-1:2010 EN 61508-2:2010 EN 61508-3:2010 ISO 19849-1:2015 EN ISO 19849-1:2015 IEC 62061:2005 IEC 62061:2005/AMD1:2012 IEC 62061:2005/AMD2:2015 EN 62061:2005/A2:2015 EN 61800-5-1:2007 EN 61800-5-2:2007 IEC 61000-6-7:2014 EN 61000-6-7:2015	Certification	English	
JVOP-KPLCC04xxx, JVOP-KPLCD04xxx AC Drive Operators EU Declaration of Conformity 06/2023 Radio Equipment Directive, Electromagnetic Compatibility Directive, RoHS, Certificate No. EZZ024397<1>, issued June 12, 2023	Certification	Czech, Danish, Dutch, English, Finnish, French, German, Italian, Polish, Slovenian, Spanish, Swedish	
Options for AC Drives EU Declaration of Conformity 09/2022 PG-Options, I/O-Options, Communication-Options, Electromagnetic Compatibility Directive, RoHS, Certificate No. EZZ024190<1>, issued June 12, 2023	Certification	Czech, Danish, Dutch, English, Finnish, French, German, Italian, Polish, Slovenian, Spanish, Swedish	
Options for AC Drives EU Declaration of Conformity 01/2017 Communication-Options SI-EP2, SI-EP3/V, SI-EN3D, SI-EN3D/V, SI-EM3, SI-EM3D/V, Electromagnetic Compatibility Directive, RoHS, Certificate No. NB1907-005/R1 issued Jan 13, 2017	Certification	Czech, Danish, Dutch, English, Finnish, French, German, Italian, Polish, Slovenian, Spanish, Swedish	
Yaskawa AC Drives UL Certificate Power Conversion Equipment, AC Drives 7-Series, 1000 Series, GA Series including Options, Cert. No. NIMMS.E131457	Certification	English	

Quick Downloads

- [EU Declaration of Conformity](#)
- [TÜV Certificate](#)

10.1 Software Tools

Tool	Description	System	Connection
DriveWizard 10	PC Tool for parameter management/backup/diagnostics	Windows	USB-mini
DriveWizard Mobile	Mobile app for parameter management/backup/diagnostics	Android	Bluetooth USB-mini with USB on-the-go adapter
		iPhone	Bluetooth

10.2 GA700 Info Page

 [GA700 Online Info](#)

AC Drive GA700

Technical Data Sheet

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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 Act. 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.

Original instructions.

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