

GETTING STARTED



CHAPTER 1

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USER MANUAL OVERVIEW

OVERVIEW OF THIS PUBLICATION

The *DURAPULSE* GS30 Drive User Manual describes the installation, configuration, and methods of operation of the *DURAPULSE* GS30 Series AC Drive. Throughout this manual, please note:

- GS30 refers to GS31 and GS33 models

WHO SHOULD READ THIS MANUAL

This manual contains important information for those who will install, maintain, and/or operate any of the GS30 Series AC Drives.

SUPPLEMENTAL PUBLICATIONS

The National Electrical Manufacturers Association (NEMA) publishes many different documents that discuss standards for industrial control equipment. Global Engineering Documents handles the sale of NEMA documents. For more information, you can contact Global Engineering Documents at:

15 Inverness Way East
Englewood, CO 80112-5776
1-800-854-7179 (within the U.S.)
303-397-7956 (international)
www.global.ihs.com

TECHNICAL SUPPORT

By Telephone: 770-844-4200
(Mon.–Fri., 9:00 a.m.–6:00 p.m. E.T.)

On the Web: www.automationdirect.com

Our technical support group is glad to work with you in answering your questions. If you cannot find the solution to your particular application, or, if for any reason you need additional technical assistance, please call technical support at **770-844-4200**. We are available weekdays from 9:00 a.m. to 6:00 p.m. Eastern Time.

We also encourage you to visit our website where you can find technical and non-technical information about our products and our company. Visit us at www.automationdirect.com.

PRODUCED BY

GS30 series drives and accessories are a product of:
Automation Direct
3505 Hutchinson Road
Cumming, GA 30040-5860

SPECIAL SYMBOLS



NOTE: When you see the “notepad” icon in the left-hand margin, the paragraph to its immediate right will be a special note.



WARNING: WHEN YOU SEE THE “EXCLAMATION MARK” ICON IN THE LEFT-HAND MARGIN, THE PARAGRAPH TO ITS IMMEDIATE RIGHT WILL BE A WARNING. THIS INFORMATION COULD PREVENT INJURY, LOSS OF PROPERTY, OR EVEN DEATH (IN EXTREME CASES).

PURPOSE OF AC DRIVES

AC drives are known by many different names: Adjustable Frequency Drives (AFD), Variable Frequency Drives (VFD), and Inverters. Drives are used primarily to vary the speed of three-phase AC induction motors, and they also provide non-emergency start and stop control, acceleration and deceleration, and overload protection. By gradually accelerating the motor, drives can reduce the amount of motor startup inrush current.

AC drives function by converting incoming AC power to DC, which is then synthesized back into three-phase output power. The voltage and frequency of this synthesized output power is directly varied by the drive, where the frequency determines the speed of the three phase AC induction motor.

SELECTING THE PROPER DRIVE RATING

DETERMINE MOTOR FULL-LOAD AMPERAGE (FLA)

Motor FLA is located on the nameplate of the motor.

NOTE: FLA of motors that have been rewound may be higher than stated.

DETERMINE MOTOR OVERLOAD REQUIREMENTS

Many applications experience temporary overload conditions due to starting requirements or impact loading. Most AC drives are designed to operate at 150% overload for 60 seconds. If the application requires an overload greater than 150% or longer than 60 seconds, the AC drive must be oversized.

NOTE: Applications that require replacement of existing motor starters with AC drives may require up to 600% overload.

DETERMINE APPLICATION TYPE; CONSTANT TORQUE OR VARIABLE TORQUE

This torque requirement has a direct effect on which drive to select. Variable Torque (VT) applications are generally easier to start and typically involve fans and pumps. Most other applications outside fans and pumps fall into the Constant Torque (CT) category (machine control, conveyors, etc.). If you are unsure of the application, assume Constant Torque. The specification, derating, and selection tables are generally split into Constant Torque and Variable Torque categories.

INSTALLATION ALTITUDE

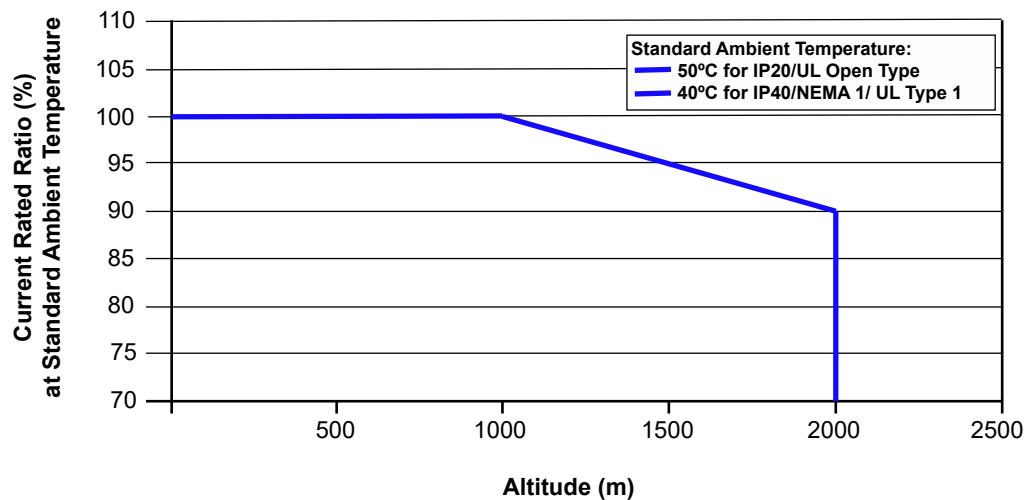
AC drives rely on air flow for cooling. As the altitude increases, the air becomes less dense. This drop in air density decreases the cooling properties of the air. Therefore, the AC drive must be oversized to compensate for the decrease in cooling. Most AC drives are designed to operate at 100% capacity at altitudes up to 1000 meters.

NOTE: For use above 1000m, the AC drive must be derated as described below.

DERATE OUTPUT CURRENT BASED ON ALTITUDE ABOVE 1000 METERS

- If the AC drive is installed at an altitude of 0–1000m, follow normal operation restrictions.
- If installed at an altitude of 1000–2000m, decrease 1% of the rated current or lower 0.5°C of temperature for every 100m increase in altitude (1% or 0.9°F per 328ft).
- Maximum altitude for Corner Grounded is 2000m. If installation at an altitude higher than 2000m is required, please contact AutomationDirect.

Derating for Altitude



DETERMINE MAXIMUM ENCLOSURE INTERNAL TEMPERATURE

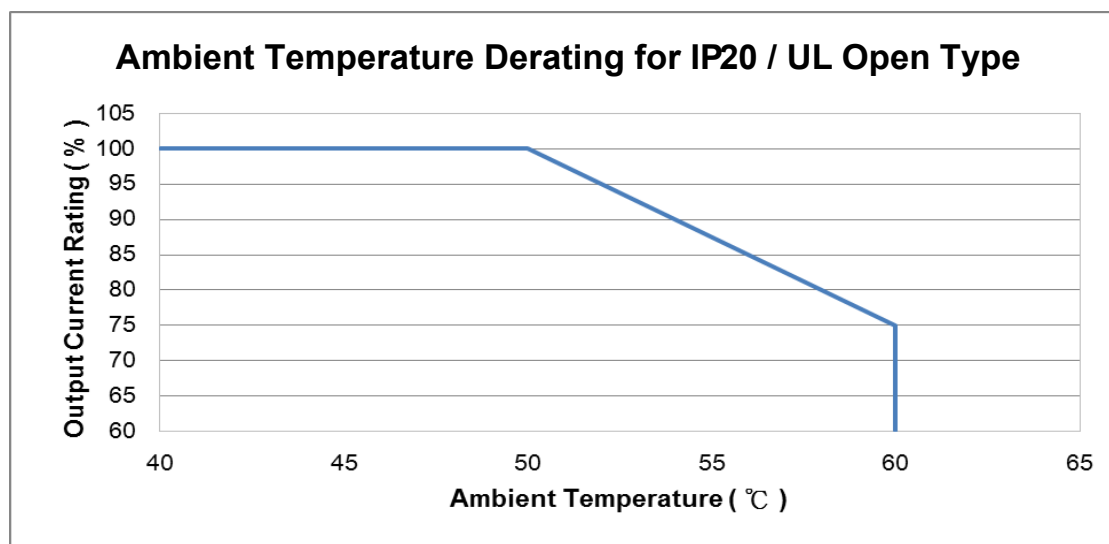
AC drives generate a significant amount of heat and may cause the internal temperature of an enclosure to exceed the rating of the AC drive, even when the ambient temperature is less than 104°F [40°C]. Enclosure ventilation and/or cooling may be required to maintain a maximum internal temperature of 104°F [40°C] or less. Ambient temperature measurements/calculations should be made for the maximum expected temperature. When permissible, flange mounting the AC drive (mounting with the drive heatsink in open ambient air) can greatly reduce heating in the enclosure.

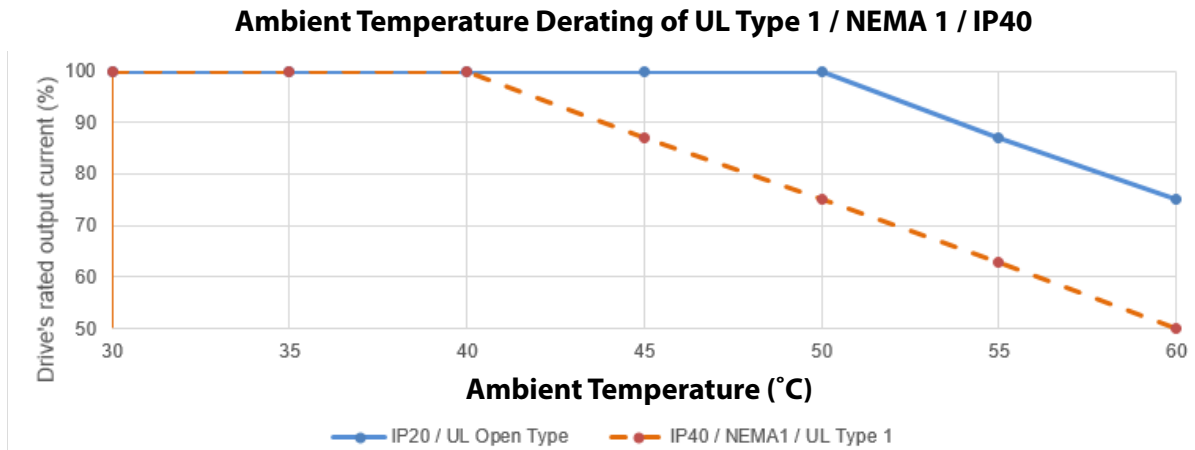


For use above 104°F [40°C], the AC drive must be derated as described below.

DERATE OUTPUT CURRENT BASED ON TEMPERATURE ABOVE 104°F [40°C]

Drive Derating by Temperature and Protection Level	
Protection Level	Derating
UL Open Type / IP20 *	If the AC motor drive operates at the rated current, the ambient temperature needs to be between -20 to 50°C. If the temperature is above 50°C, decrease 2.5% of the rated current for every 1°C increase in temperature. The maximum allowable temperature is 60°C.
UL Type 1 / NEMA 1 / IP40 *	When the AC motor drive is operating at the rated current, the ambient temperature must be between -20 to 40°C. When the temperature is over 40°C, for every increase by 1°C, decrease the rated current 2.5%. The maximum allowable temperature is 50°C.
* For more information about environmental ratings, refer to the "DURApulse GS30 AC Drive Environmental Information" on page 1–11 of this chapter.	





DERATE OUTPUT CURRENT BASED ON CARRIER FREQUENCY (IF NECESSARY)**CARRIER FREQUENCY EFFECTS**

AC Drives rectify the incoming 50 or 60Hz line power resulting in DC power at 0Hz. The resulting DC power is then pulse-width modulated and supplied to the motor by the drive's power electronics. IGBTs invert the DC power, simulating a sine wave at the desired frequency (that's what allows variable speed in AC induction motors). The speed at which the IGBTs are turned ON and OFF is called the Carrier Frequency. In AC drives, the Carrier Frequency can range from 2kHz to 15kHz. The Carrier Frequency can be adjusted in most AC Drives.

There are trade-offs between choosing High Carrier Frequencies and Low Carrier Frequencies.

BENEFITS OF HIGHER CARRIER FREQUENCIES:

- Better efficiency (lower harmonic losses) in the motor
- Lower audible noise

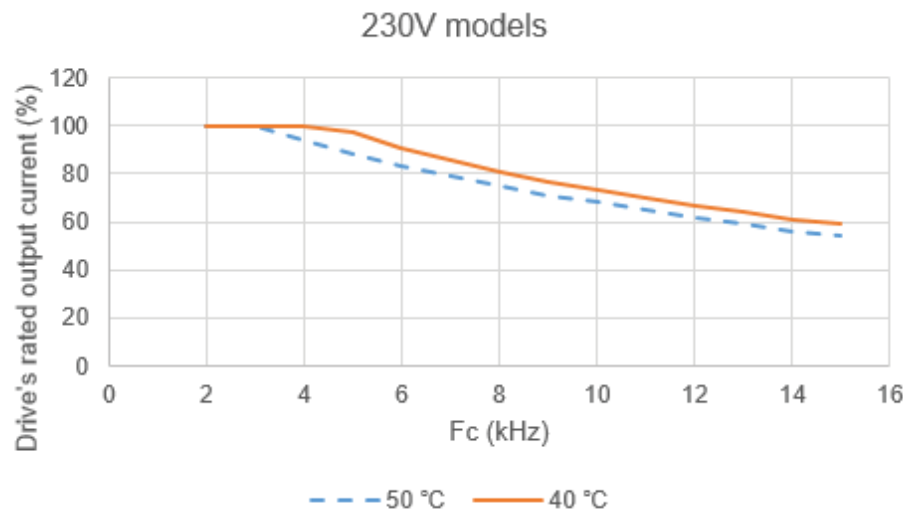
BENEFITS OF LOWER CARRIER FREQUENCIES:

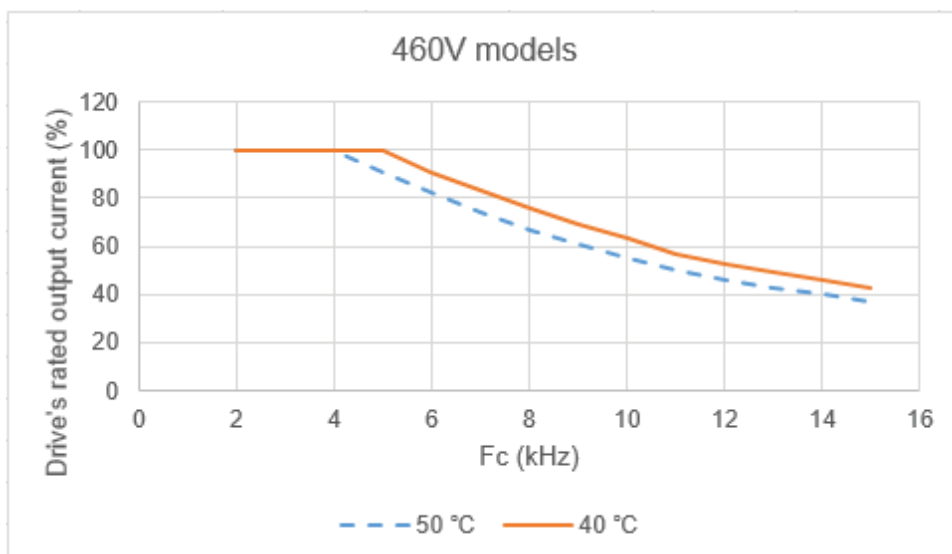
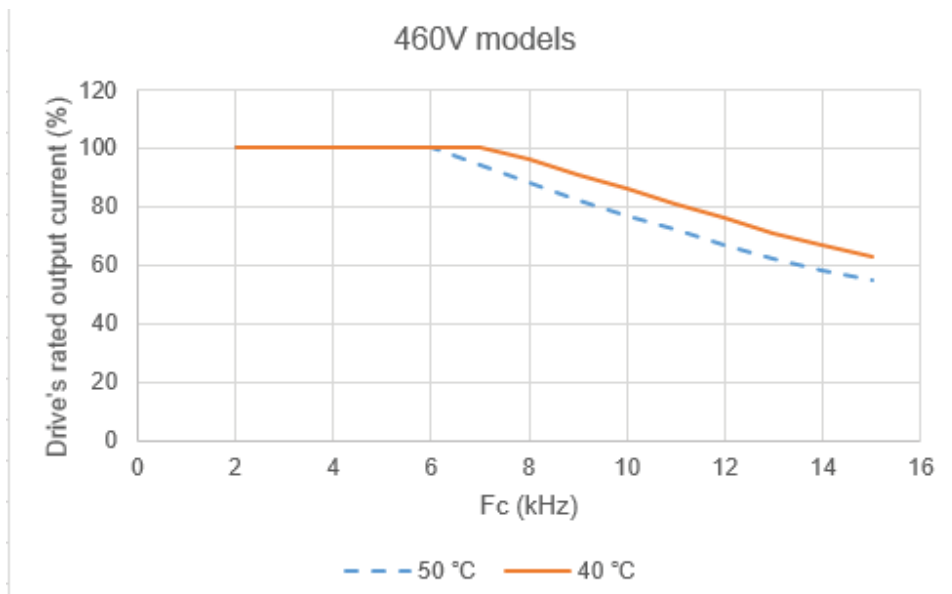
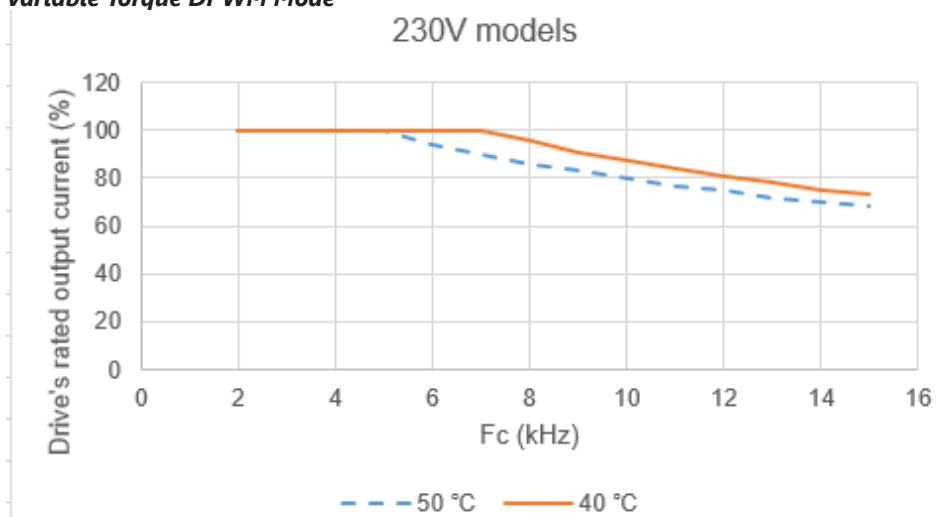
- Better efficiency in the drive
- Lower EMI (electrical noise)
- Reduced reflective wave peak voltage

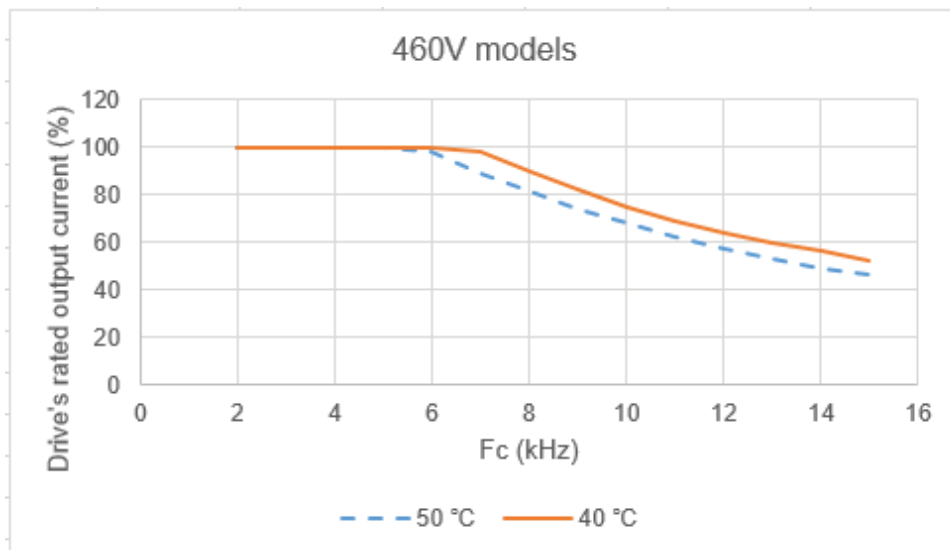
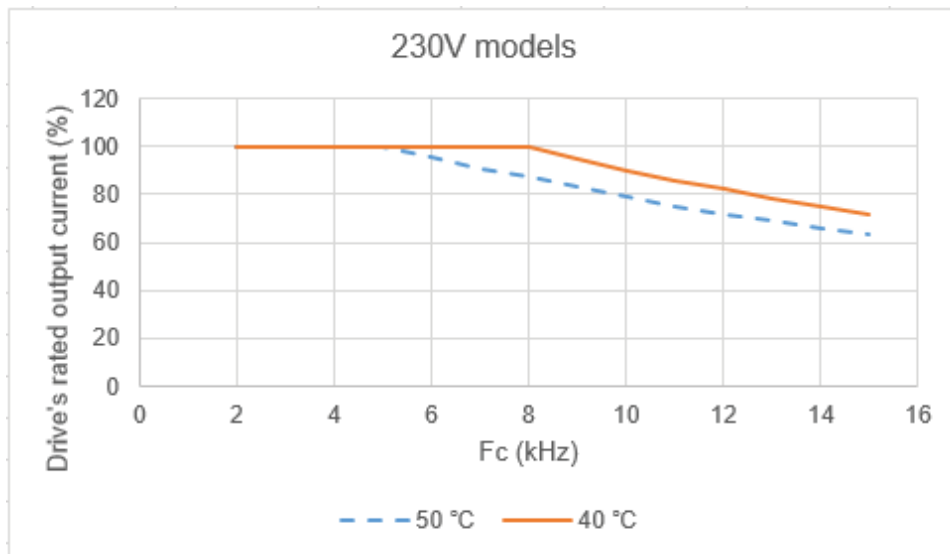
As a general rule, the Carrier Frequency should be set as low as possible without creating unacceptable audible noise in the motor. Smaller systems can have higher Carrier Frequencies, but larger drives (>20 or 30hp) should not have Carrier Frequencies set higher than 6kHz. Constant torque applications typically run around 2–4kHz.

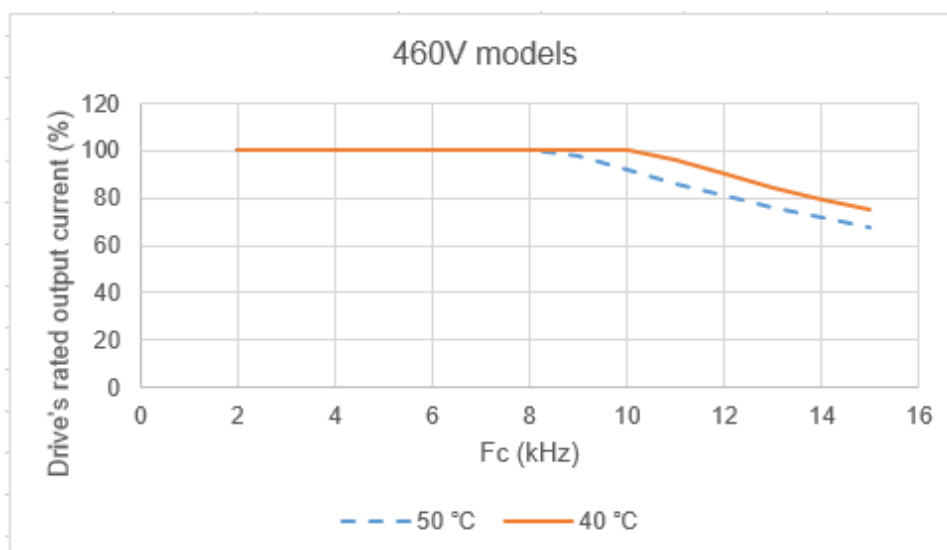
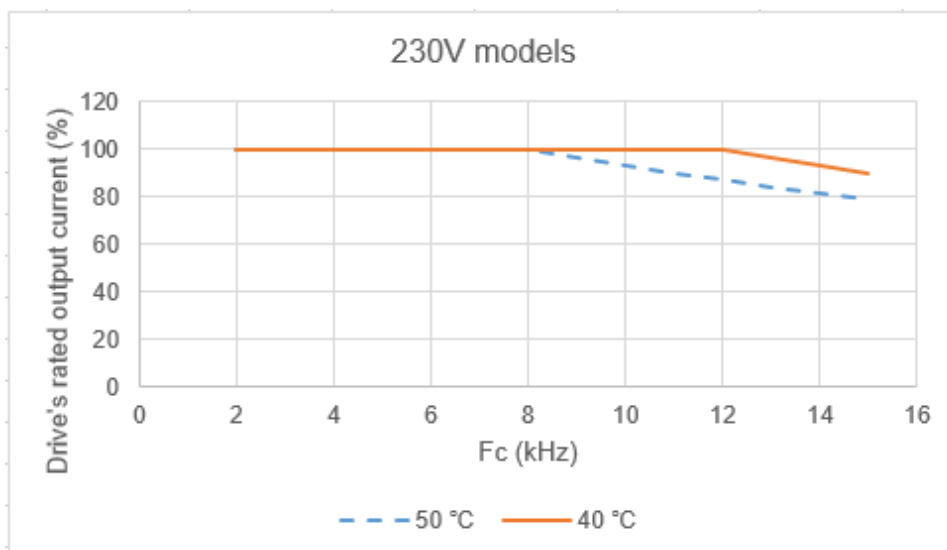
GS30 VARIABLE TORQUE CARRIER FREQUENCY DERATING

Note: Space Vector Pulse Width Modulation (SVPWM) and Two-Phase Pulse Width Modulation (DPWM) are determined by parameter P11.41. See Chapter 4 for details.

Variable Torque SVPWM Mode

**Variable Torque DPWM Mode**

GS30 CONSTANT TORQUE CARRIER FREQUENCY DERATING**Constant Torque SVPWM Mode**

Constant Torque DPWM Mode

DURAPULSE GS30 AC DRIVE ENVIRONMENTAL INFORMATION

STORAGE AND TRANSPORTATION

AC drives should be kept in the shipping cartons or crates until they are installed. In order to retain the warranty coverage, they should be stored as described below if not to be installed and used within three months.

- Store in a clean and dry location free from direct sunlight and corrosive fumes.
- Store within environmental conditions shown below in the “Environmental Conditions” table.
- DO NOT store in an area with rapid changes in temperature, to avoid condensation and frost.
- DO NOT place directly on the ground.



If the drive is stored or is otherwise unused for more than a year, the drive's internal DC link capacitors should be recharged before use. Otherwise, the capacitors may be damaged when the drive starts to operate. We recommend recharging the capacitors of any unused drive at least once per year. (Refer to Chapter 6, “Maintenance and Troubleshooting” for information about recharging DC link capacitors.)

GS30 ENVIRONMENTAL CONDITIONS

Environmental Conditions for GS30 AC Drives			
Condition	Operation	Storage	Transportation
Installation Location	IEC 60364-1/ IEC 60664-1 Pollution degree 2, Indoor use only.	n/a	n/a
Ambient Temperature	IP20/UL Open Type: -20 to 50°C (-20 to 60°C w/derating) [-4 to 122°F (-4 to 140°F w/derating)]	-40 to 85°C [-40 to 185°F]	-20 to 70°C [-4 to 158°F]
	Non-condensing, non-freezing		
Relative Humidity	90%, no water condensation	95%, no water condensation	
Air Pressure	86–106 kPa	70–106 kPa	
Pollution Level	IEC 60721-3-3, concentrate prohibited		
	Class 3C2; Class 3S2	Class 2C2; Class 2S2	Class 1C2; Class 1S2
Altitude	<1000 m (For altitudes > 1000 m, derate to use it.)		
Package Drop	n/a	ISTA procedure 1A (according to weight) IEC 60068-2-31	
Vibration	1.0 mm, peak to peak value range from 2–13.2 Hz; 0.7–1.0 G range from 13.2–55 Hz; 1.0 G range from 55–512 Hz. Compliance with IEC 60068-2-6	2.5 G peak, 5 Hz–2 kHz 0.015 inch maximum displacement	
Impact	15 G, 11 ms, compliance with IEC/EN60068-2-27	30G*	
*20G for Frame A-D option card installation kit.			

*20G for Frame A-D option card installation kit.



NOTE: DO NOT expose the GS30 AC Drive to harsh environments such as dust, direct sunlight, corrosive/flammable gases, humidity, liquid, or vibrations. The salts in the air must be less than 0.01 mg/cm² every year.

GS30 GENERAL SPECIFICATIONS

General Specifications for GS30 AC Drives		
Control Characteristics	Control Method	See GS30 Motor Control table (below)
	Applicable Motor	IM (Induction Motor), PM motor control (IPM and SPM)
	Speed Control Range ¹	See GS30 Motor Control table (below)
	Torque Limits	VT: 160% of output current, max CT: 180% of output current, max
	Max. Output Frequency	0.00–599.00 Hz
	Overload Capacity	VT: rated output current of 120% 60 sec. every 5 minutes, 150% 3 sec. every 30 seconds CT: rated output current of 150% 60 sec. every 5 minutes, 200% 3 sec. every 30 seconds
	Frequency Setting Signal	0–10 V / -10–10 V 4–20 mA / 0–10 V 1 channel pulse input (33 kHz), 1 channel pulse output (33 kHz)
	Digital Inputs	Seven (7) - 24VDC NPN or PNP, includes 1 frequency input 33kHz
	Digital Outputs	Three (3) - (2)-48VDC, (1) Relay-250VAC/30VDC
	Analog Inputs	Two (2) - (1) voltage, (1) selectable Voltage or Current
	Analog Outputs	One (1) - selectable voltage or current
	Frequency Output	One (1) - 30VDC, 33kHz
	Safe Torque Off	STO1 and STO2 inputs- 24VDC
Protection Characteristics	Main Functions	Multiple motor switching (a maximum of eight independent motor parameter settings), Fast start-up, Deceleration Energy Back (DEB) function, Wobble frequency function, Fast deceleration function, Master and Auxiliary frequency source selectable, Restart after momentary power loss, Speed tracking, Over-torque detection, Torque limit, 16-step speed (including the master speed), Accel./decel. time switch, S-curve accel./decel., three-wire operation control, JOG frequency, Frequency upper/lower limit settings, DC brake at start-up and stop, PID control, Built-in PLC (5000 steps), Positioning function, Tension control function, Built-in RS-485 (odbus) and CANopen.
	Application Macro	Built-in application parameter groups (selected by industry) and user-defined application parameter groups.
	Motor Protection	Over-current, Over-voltage, Over-heating, Phase loss, Overload.
Option Cards	Stall Prevention	Stall prevention during acceleration, deceleration and running (independent settings).
	Communication	GS30A-CM-EIP1, GS30A-CM-EIP2, GS30A-CM-ECAT, GS30A-CM-EIPKITP2
	Encoder	GS30A-FB-LD, GS30A-FB-OC
	Extension I/O	GS30A-06CDD, GS30A-2AD2DA, GS30A-02TRC, GS30A-03TRA
Agency Approvals²	24V Power	GS30-BPS
	UL, CE, RCM, TÜV (SIL 2), RoHS, REACH	

1: Control accuracy may vary depending on the environment, application conditions or different motors. For more information contact AutomationDirect.

2: See CE declaration on the GS30 support page at www.automationdirect.com

GS30 Motor Control (Applicable to All Models)					
	Motor Type	Control Mode		Start Torque	Speed Control Range (Turndown/Accuracy)
		Description	Symbol		
Motor Control	Induction Motor (IM)	Volts/Hz	IMVF	150% @ 3Hz	1:50
		Volts/Hz+encoder	IMVFPG		
		Sensorless vector	IMSVC		
		Field oriented control sensorless	IMFOC	200% @ 0.5 Hz	1:100
		Torque sensorless	IMTQC		±15%
		Field oriented control+encoder*	IMFOCPG	200% @ 0Hz	1:1000
		Torque+encoder*	IMTQCPG		±5%
	Permanent Magnet AC Motor (PM)	Sensorless vector	PMSVC	100% @ 1/20th motor frequency	1:20
		Field oriented control sensorless	PMSVC or IPM	150% @ 0Hz	1:100
		Field oriented control+encoder*	PMFOCPG	200% @ 0Hz	1:1000
		Torque+encoder*	PMTQCPG		±5%

* Encoder option card GS30A-DB-LD or GS30A-DB-OC is required.

EFFICIENCY CLASS

The EU Ecodesign regulation directive establishes a framework to set mandatory ecological requirements for energy-using and energy-related products. The IEC 61800-9-2 standard defines the efficiency classes for AC drives. The efficiency classes range (low to high) from IE0 to IE2. These classes apply to AC drives rated 100 to 1000 V and 0.12 to 1000 kW (1/6 to 1,340 HP).

Drive manufacturers must declare power losses in terms of percentage of rated apparent output power at eight different operating points, as well as standby losses. The International Efficiency (IE) level is given at the nominal point.

The power losses of GS30 drives shall not exceed the maximum power losses corresponding to the IE2 efficiency level. For specific power losses of each drive model, see the drive specification tables.

DURAPULSE GS30 AC DRIVE SPECIFICATIONS**230V CLASS – 1-PHASE MODEL-SPECIFIC SPECIFICATIONS**

GS30 230V Class Specifications; Frame Size A, B, C ¹								
Model Name: GS31-2xxx				GS31-20P5	GS31-21P0	GS31-22P0	GS31-23P0	
Frame Size				A	B	C	C	
Output Rating	Max Motor Output			hp	1/2	1	2	3
				kW	0.4	0.75	1.5	2.2
	CT	Rated Output Capacity		kVA	1.1	1.9	2.9	4.2
		Rated Output Current		A	2.8	5.0	7.5	11
		Carrier Frequency ³		kHz	2–15 (default 4)			
	VT	Rated Output Capacity		kVA	1.2	2.0	3.2	4.8
Rated Output Current		A	3.2	5.2	8.5	12.5		
Carrier Frequency ³		kHz	2–15 (default 4)					
Input Rating ²	CT	Rated Input Current		A	7.3	11.2	16.5	24.2
	VT	Rated Input Current		A	8.3	11.7	18.5	27.5
	Rated Voltage/Frequency			1-phase 200-240 VAC (-15% to +10%), 50/60 Hz				
	Operating Voltage Range (VAC)			170–265				
	Frequency Tolerance (Hz)			47–63				
IE2 Efficiency – Relative Power Loss (%)				3.5	2.8	2.7	2.5	
SCCR Rating				100kA				
Weight (kg)				0.76	0.81	1.05	1.24	
Cooling Method				Convective		Fan		
IP Rating				IP20				
1 - For use with three-phase motors only.								
2 - Please refer to “Appendix A: Accessories” for input fusing information.								
3 - The value of the carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency (if necessary)” on page 1–7								

230V CLASS – 3-PHASE MODEL-SPECIFIC SPECIFICATIONS

GS30 230V Class Specifications; Frame Size A, B, C ¹									
Model Name: GS33-2xxx				GS33-20P5	GS33-21P0	GS33-22P0	GS33-23P0	GS33-25P0	
Frame Size				A	A	B	C	C	
Output Rating	Max Motor Output			hp	1/2	1	2	3	5
				kW	0.4	0.75	1.5	2.2	3.7
	CT	Rated Output Capacity (3-phase [1-phase])	kVA	1.9	1.9	2.9	4.2	6.5	
		Rated Output Current (3-phase [1-phase])	A	5.0	5.0	7.5	11.0	17.0	
		Carrier Frequency ³	kHz	2–15 (default 4)					
	VT	Rated Output Capacity	kVA	1.2	2.0	3.0	4.8	7.4	
		Rated Output Current	A	3.2	5.2	8.0	12.5	19.5	
		Carrier Frequency ³	kHz	2–15 (default 4)					
Input Rating ²	CT	Rated Input Current	A	3.4	6.0	9.0	13.2	20.4	
	VT	Rated Input Current	A	3.8	6.2	9.6	15.0	23.4	
	Rated Voltage/Frequency			3-phase 200-240 VAC (-15% to +10%), 50/60 Hz					
	Operating Voltage Range (VAC)			170–265					
	Frequency Tolerance (Hz)			47–63					
IE2 Efficiency – Relative Power Loss (%)				3.5	3.0	2.6	2.5	2.3	
SCCR Rating				100kA					
Weight (kg)				0.76	0.81	1.05	1.24	1.24	
Cooling Method				Convective			Fan		
IP Rating				IP20					
1 - For use with three-phase motors only.									
2 - If three-phase power source is non-symmetrical, refer to “Circuit Connections – RFI Jumper” on page 2–15. Please refer to “Appendix A: Accessories” for input fusing information.									
3 - The value of the carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency (if necessary)” on page 1–7									

230V CLASS – 3-PHASE MODEL-SPECIFIC SPECIFICATIONS, CONTINUED

GS30 230V Class Specifications; Frame Size D, E, F ¹							
Model Name: GS33-2xxx			GS33-27P5	GS33-2010	GS33-2015	GS33-2020	
Frame Size			D	E	E	F	
Output Rating	Max Motor Output		hp	7.5	10	15	20
			kW	5.5	7.5	11	15
	CT	Rated Output Capacity (3-phase [1-phase])	kVA	9.5	12.6	18.7	24.8
		Rated Output Current (3-phase [1-phase])	A	25.0	33.0	49.0	65.0
		Carrier Frequency ³	kHz	2–15 (default 4)			
	VT	Rated Output Capacity	kVA	10.3	13.7	19.4	26.3
		Rated Output Current	A	27.0	36.0	51.0	69.0
		Carrier Frequency ³	kHz	2–15 (default 4)			
Input Rating ²	CT	Rated Input Current	A	30.0	39.6	58.8	78.0
	VT	Rated Input Current	A	32.4	43.2	61.2	82.8
	Rated Voltage/Frequency		3-phase or 1-phase 200-240 VAC (-15% to +10%), 50/60 Hz				
	Operating Voltage Range (VAC)		170–265				
	Frequency Tolerance (Hz)		47–63				
IE2 Efficiency – Relative Power Loss (%)			2.4	2.4	2.3	2.1	
SCCR Rating			100kA				
Weight (kg)			2.07	3.97	3.97	6.30	
Cooling Method			Fan				
IP Rating			IP20				
1 - For use with three-phase motors only.							
2 - If three-phase power source is non-symmetrical, refer to “Circuit Connections – RFI Jumper” on page 2–15. Please refer to “Appendix A - Accessories” for input fusing information.							
3 - The value of the carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency (if necessary)” on page 1–7							

230V CLASS – 3-PHASE MODEL-SPECIFIC SPECIFICATIONS, CONTINUED

GS30 230V Class Specifications; Frame Size G, I ¹								
Model Name: GS33-2xxx				GS33-2025	GS33-2030	GS33-2040	GS33-2050	
Frame Size				G	G	I	I	
Output Rating	Max Motor Output			hp	25	30	40	50
				kW	18.5	22	30	37
	CT	Rated Output Capacity (3-phase [1-phase])		kVA	28.9	34.4	46.9	57.8
		Rated Output Current (3-phase [1-phase])		A	75	90	120	146
		Carrier Frequency ³		kHz	2–15 (default 4)			
	VT	Rated Output Capacity		kVA	31.6	37.6	51.3	63.3
		Rated Output Current		A	81	102	134	160
		Carrier Frequency ³		kHz	2–15 (default 4)			
Input Rating ²	CT	Rated Input Current		A	77	92	117	143
	VT	Rated Input Current		A	85	103	126	151
	Rated Voltage/Frequency			3-phase or 1-phase 200-240 VAC (-15% to +10%), 50/60 Hz				
	Operating Voltage Range (VAC)			170–265				
	Frequency Tolerance (Hz)			47–63				
IE2 Efficiency – Relative Power Loss (%)				2.3	2.4	2.3	2.3	
SCCR Rating				5kA			10kA	
Weight (kg)				11.8	11.8	33	33.5	
Cooling Method				Fan				
IP Rating				IP20				
1 - For use with three-phase motors only.								
2 - If three-phase power source is non-symmetrical, refer to “Circuit Connections – RFI Jumper” on page 2–15. Please refer to “Appendix A - Accessories” for input fusing information.								
3 - The value of the carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency (if necessary)” on page 1–7								

460V CLASS – 3-PHASE MODEL-SPECIFIC SPECIFICATIONS

GS30 460V Class Specifications; Frame Size A, B, C ¹								
Model Name: GS33-4xxx				GS33-40P5	GS33-41P0	GS33-42P0	GS33-43P0	GS33-45P0
Frame Size				A	A	B	C	C
Output Rating	Max Motor Output		hp	1/2	1	2	3	5
			kW	0.4	0.75	1.5	2.2	3.7
	CT	Rated Output Capacity	kVA	1.1	2.3	3.2	4.3	6.9
		Rated Output Current	A	1.5	3.0	4.2	5.7	9.0
		Carrier Frequency ³	kHz	2–15 (default 4)				
	VT	Rated Output Capacity	kVA	1.4	2.5	3.5	5.0	8.0
		Rated Output Current	A	1.8	3.3	4.6	6.5	10.5
Carrier Frequency ³		kHz	2–15 (default 4)					
Input Rating ²	CT	Rated Input Current	A	2.1	4.2	5.8	6.1	9.9
	VT	Rated Input Current	A	2.5	4.6	6.4	7.2	11.6
	Rated Voltage/Frequency			Three-phase 380-480 VAC (-15% to +10%), 50/60 Hz				
	Operating Voltage Range (VAC)			323-528				
	Frequency Tolerance (Hz)			47–63				
IE2 Efficiency – Relative Power Loss (%)				4.4	2.8	2.4	2.3	3.1
SCCR Rating				100kA				
Weight (kg)				0.76	0.77	1.05	1.24	1.24
Cooling Method				Convective		Fan		
IP Rating				IP20				
1 - For use with three-phase motors only.								
2 - If three-phase power source is non-symmetrical, refer to "Circuit Connections – RFI Jumper" on page 2–15. Please refer to "Appendix A - Accessories" for input fusing information.								
3 - The value of the carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to "Derate Output Current Based on Carrier Frequency (if necessary)" on page 1–7								

460V CLASS – 3-PHASE MODEL-SPECIFIC SPECIFICATIONS, CONTINUED

GS30 460V Class Specifications; Frame Size D, E, F ¹										
Model Name: GS33-4xxx				GS33-47P5	GS33-4010	GS33-4015	GS33-4020	GS33-4025	GS33-4030	
Frame Size				D	D	E	E	F	F	
Output Rating	Max Motor Output			hp	7.5	10	15	20	25	30
				kW	5.5	7.5	11	15	18.5	22
	CT	Rated Output Capacity		kVA	9.9	13.3	19.1	24.4	29	34.3
		Rated Output Current		A	13.0	17.5	25.0	32.0	38.0	45.0
		Carrier Frequency ³		kHz	2–15 (default 4)					
	VT	Rated Output Capacity		kVA	11.1	15.1	21.3	27.4	31.6	37.3
		Rated Output Current		A	14.5	19.8	28.0	36.0	41.5	49.0
		Carrier Frequency ³		kHz	2–15 (default 4)					
Input Rating ²	CT	Rated Input Current		A	14.3	19.3	27.5	35.2	41.8	49.5
	VT	Rated Input Current		A	16.0	21.8	30.8	39.6	45.7	53.9
	Rated Voltage/Frequency			Three-phase 380-480 VAC (-15% to +10%), 50/60 Hz						
	Operating Voltage Range (VAC)			323-528						
	Frequency Tolerance (Hz)			47–63						
IE2 Efficiency – Relative Power Loss (%)				2.0	1.9	1.7	1.6	1.5	1.4	
SCCR Rating				100kA						
Weight (kg)				2.07	2.07	3.97	3.97	6.30	6.30	
Cooling Method				Fan						
IP Rating				IP20						
1 - For use with three-phase motors only.										
2 - If three-phase power source is non-symmetrical, refer to "Circuit Connections – RFI Jumper" on page 2–15. Please refer to "Appendix A - Accessories" for input fusing information.										
3 - The value of the carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to "Derate Output Current Based on Carrier Frequency (if necessary)" on page 1–7										

460V CLASS – 3-PHASE MODEL-SPECIFIC SPECIFICATIONS, CONTINUED

GS30 460V Class Specifications; Frame Size G, H, I ¹									
Model Name: GS33-4xxx				GS33-4040	GS33-4050	GS33-4060	GS33-4075	GS33-4100	
Frame Size				G	H	H	I	I	
Output Rating	Max Motor Output			hp	40	50	60	75	100
				kW	30	37	45	55	75
	CT	Rated Output Capacity	kVA	46.9	57.8	70.3	85.9	117.2	
		Rated Output Current	A	60	75	91	112	150	
		Carrier Frequency ³	kHz	2–15 (default 4)					
	VT	Rated Output Capacity	kVA	51.3	63.3	76.9	94	128.2	
		Rated Output Current	A	69	85	108	128	180	
		Carrier Frequency ³	kHz	2–15 (default 4)					
Input Rating ²	CT	Rated Input Current	A	63	66	80	110	147	
	VT	Rated Input Current	A	72.5	77	97	123	173	
	Rated Voltage/Frequency			Three-phase 380-480 VAC (-15% to +10%), 50/60 Hz					
	Operating Voltage Range (VAC)			323-528					
	Frequency Tolerance (Hz)			47–63					
IE2 Efficiency – Relative Power Loss (%)				1.4	2.0	1.8	1.7	1.7	
SCCR Rating				5kA		10kA			
Weight (kg)				11.7	25.1	28.6	36	39	
Cooling Method				Fan					
IP Rating				IP20					
1 - For use with three-phase motors only.									
2 - If three-phase power source is non-symmetrical, refer to “Circuit Connections – RFI Jumper” on page 2–15. Please refer to “Appendix A - Accessories” for input fusing information.									
3 - The value of the carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency (if necessary)” on page 1–7									

RECEIVING AND INSPECTION

DRIVE PACKAGE CONTENTS

After receiving the GS30 AC Drive, please check the following:

- 1) Make sure that the package includes the DURAPULSE GS30 AC Drive and the Quick-Start Guide that matches your product.
- 2) Please inspect the unit after unpacking to assure it was not damaged during shipment. Make sure that the part number printed on the package corresponds with the part number indicated on the nameplate.
- 3) Make sure that the part number indicated on the nameplate corresponds with the part number of your order.
- 4) Make sure that the voltage for the wiring lies within the range as indicated on the nameplate. Please install the GS30 AC Drive according to this manual.
- 5) Before applying the power, please make sure that all the devices, including power, motor, control board, and digital keypad are connected correctly.
- 6) When wiring the GS30 AC Drive, please make sure that the wiring of input terminals “R/L1, S/L2, T/L3” and output terminals “U/T1, V/T2, W/T3” are correct to prevent drive damage.
- 7) When power is applied, select the language and set parameter groups via the digital keypad. When executing a trial run, please begin with a low speed, and then gradually increase the speed until the desired speed is reached.

The GS30 AC Drive should be kept in the shipping carton before installation. In order to retain the warranty coverage, the GS30 AC Drive should be stored properly when it is not to be used for an extended period of time. Refer to the preceding “Environmental Information” section for proper storage conditions.

MODEL NUMBER EXPLANATION

GS33-4 7P5

■ Applicable Motor Capacity*

0P5: 0.5hp	1P0: 1.0hp	2P0: 2.0hp	3P0: 3.0hp
5P0: 5.0hp	7P5: 7.5hp	010: 10hp	015: 15hp
020: 20hp	025: 25hp	030: 30hp	040: 40hp
050: 50hp	060: 60hp	075: 75hp	100: 100hp

*Not all capacities are available in each voltage.

■ Input Voltage

2: 230VAC
4: 460VAC

■ Phase

1: One-phase
3: Three-phase

■ Series Name

NAMEPLATE INFORMATION

AC Drive Model → **MODEL: GS33-27P5**

Input Voltage / Current → **INPUT :**
VT : 3PH 200-240V 50/60Hz 32.4A
CT : 3PH 200-240V 50/60Hz 30.0A

Output Voltage / Current → **OUTPUT : POWER VT(CT) 7.5HP(7.5HP)**
VT : 3PH 0-230V 27A 10.3KVA 5.5KW
CT : 3PH 0-230V 25A 9.5KVA 5.5KW

Frequency Range → **FREQUENCY RANGE : 0-599Hz**

Enclosure Type (IPXX) → **SHORT CIRCUIT CURRENT : 100KA**
IP20/UL Open-Type (rated-20°C to 50°C Ambient)
NEMA 1/UL Type 1 when installed with conduit box kit (rated-20°C to 40°C Ambient).
Refer to user manual.

Certifications → **CE**, **UKCA**, **TÜV Rheinland**, **UL 19XX CERTIFIED**, **SAFETY US CA E198015**, **IND. CONT. EQ.**

Model+Serial Number → **GS3327P5+T23200001**

Firmware Version → **Ver: 0.4**

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