YASKAWA

YASKAWA AC Drive

GPD515/G5 to A1000

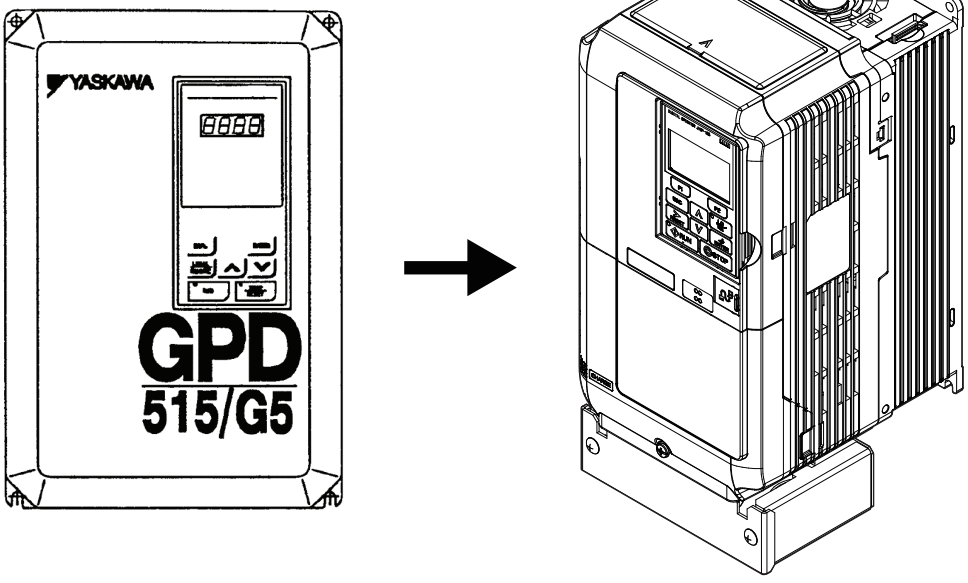
Product Transition Guide

Type: CIMR-G5U☐☐☐☐

Models: 200 V Class, Three-Phase Input: 1/2 to 150 HP HD
400 V Class, Three-Phase Input: 1/2 to 500 HP HD

Type: CIMR-AU☐☐☐☐

Models: 200 V Class, Three-Phase Input: 3/4 to 150 HP HD
400 V Class, Three-Phase Input: 3/4 to 500 HP HD



DOCUMENT NO. PL.A1000.01

Replacing GPD515/G5 with A1000

1 Feature Overview

This document details differences between the GPD515/G5 and A1000 product to assist in product transistion and new product introduction.

GPD515/G5 Drive	A1000 Drive
	
The GPD515/G5 drive is primarily used for general purpose industrial applications.	The A1000 drive is primarily used for general purpose and high performance industrial applications, including those that require precise torque and speed control as well as control of both induction and permanent magnet motors.

Table 1 Key A1000 Features and Functions

Key A1000 Features and Functions	Key A1000 Features and Functions
• Closed or open loop vector control for outstanding regulation, torque production, and position control capability	• Auxiliary Control Power Unit maximizes production time and efficiency by maintaining network communication while main power is removed
• Continuous Auto-tuning optimizes performance by compensating for changes in motor temperature	• Embedded Safe Torque Off minimizes downtime for applications requiring occasional intervention (SIL CL2, PLd, Category 3)
• High Frequency Injection enables high precision open loop control of Interior Permanent Magnet Motors	• Embedded function blocks, programmable with DriveWorksEZ, provide additional application flexibility and the opportunity to eliminate separate controllers
• Fast acting current and voltage limiters help achieve continuous drive operation during periods of excessive demand	• USB Copy Unit and Keypad configuration storage provide speed and convenience for duplicate configuration of multiple drives
• High Slip Braking reduces installation cost and the need for dynamic braking resistors	• Removable terminal board with configuration storage provides convenience of configuration backup
• Communication options for all major industrial networks provides high speed control and monitoring, reducing installation cost	• Made with RoHS compliant materials
• DriveWizard computer software and Application Sets for easy configuration	• Integrated DC Reactor (standard on 30 HP and larger) for input harmonic reduction

2 GPD515/G5 to A1000 Feature Differences

Table 2 Feature Differences

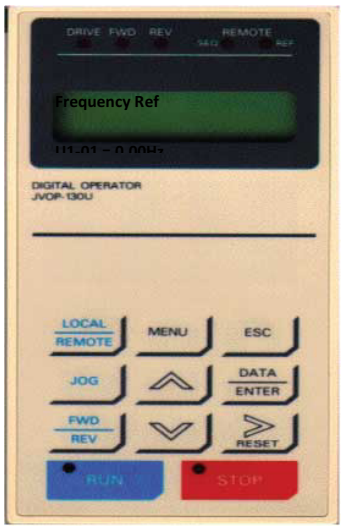
Feature	Item	Yaskawa GPD515/G5	Yaskawa A1000
HP Range	200 V	240 V 0.5 to 150 HP	240 V 0.75 to 150 HP (HD) 0.75 to 175 HP (ND) <1>
	400 V	480 V 0.5 to 500 HP	480 V 0.75 to 900 HP (HD) 0.75 to 1000 HP (ND)
	600 V	2 to 200 HP	600 V 2 to 250 HP (ND)
Input Voltage	Rated Voltage	3-phase, 200-230 Vac 3-phase, 380-460 Vac 3-Phase, 500-600 Vac	3-phase, 200-240 Vac 3-phase, 380-480 Vac 3-phase, 500-600 Vac
Motor types	—	Induction	Induction, Permanent Magnet
PWM Carrier Frequency	Range	See Appendix 1	See Appendix 1
Maximum Output Frequency	Hz	400 Hz	400 Hz (1000 Hz optional)
Keypad Design	Display	2 Line X 16 Character LCD	5 Line X 16 Character LCD keypad
	Copy Function	No	Yes
Digital Input Terminal	NPN/PNP	NPN	Switchable NPN/PNP
Digital output Terminal	Open Collector	2	0
	Relay Output	1 x Form A, 1 x Form C	3 x Form A, 1 x Form C
Analog Output	Output Level	2 channels 0-10 V or –10-+10 V or (9 bit plus sign)	2 channels with independent level selections 0-10 V (10 bit plus sign) or –10-+10 V or 10 bit plus sign or 4-20 ma 10 bit
Pulse Input	Quantity:	0	1
	Input Frequency	N/A	1-32 kHz
Pulse Output	Quantity:	0	1
	Output Frequency	N/A	1-32 kHz
Quick Disconnect Terminals	Type	No	Yes
Auto Tuning	Methods	Rotational	Rotating, Stationary, Continuous, Inertia /ASR
Preset Speeds	Qty.	8	17
Speed Search	Bi/Uni-Directional	Uni-Directional	Bi-Directional
	Method	Current Detection	Current/Speed Estimation
Auto Restart	Time Between Attemps	0.1 sec, fixed (Maximum 10 attempts)	0.0 – 5.0 sec (selectable)
Energy Savings Mode	Man/Auto	Manual/Auto	Man/Auto
DC Injection Function	At Start/At Stop	At Start/At Stop	At Start/At Stop +HSB during stop
Braking Function	DB Transistor	Built-in to 10 HP (240 V) Built-in to 25 HP (480 V) Built-in to 25 HP (575 V)	Built-in to 40 HP (HD)
	Special	No	High Slip/Over-excitation Braking
Cooling Fan On/Off Control	Power/Run	No	Selectable Always Active/During Run
Timer Function	On/Off Delay	On/Off Delay (0-300.0 sec)	On/Off Delay (0-3000 sec)
Fault Code Additions	—	—	10 with elapsed time stamp
Torque Limit/Current Limit/ Stall Prevention	—	Stall Prevention During Accel/Run/Decel (V/F) Torque Limit in 4 Quadrants (Vector)	Stall Prevention During Accel/Run/Decel (V/F) Torque Limit in 4 Quadrants (Vector) Software Current Limit (HD=150 %, ND=120 %)
Harmonic Counter Measures	—	Filters/Reactors (Options)	Filters/Reactors (Options)
	Built-In DC Bus Reactor	240 Vac: 25-100 HP (HD) 480 Vac: 30-500 HP (HD) 600 Vac: N/A	240 Vac: 30-175 HP (ND) 480 Vac: 30-1000 HP (ND) 600 Vac: 30-250 HP (ND)
Ambient Temperature	ºC	-10ºC ~ +40ºC (IP21) -10ºC ~ +45ºC (IP00)	-10 to +50°C (Chassis Installation) -10 to +40°C (Chassis with zero side clearance, or Type 1)
Storage Temperature	ºC	-20ºC ~ +60ºC	-20ºC ~ +60ºC
Network Communications	Standard	Modbus RTU via RS232	Modbus RTU via terminal I/O RS485/422
	Optional	RS232 to RS485, DeviceNet, ProfibusDP, Interbus-S, Lonworks, ModbusPlus, CanOpen, CC-link	DeviceNet, Profibus-DP, ProfiNet, Ethernet, Modbus TCP/IP, Mechatrolink
Unique Feature/Function	—	—	Over-excitation Braking

<1> HD = Heavy Duty, ND = Normal Duty

3 Digital Operator Comparison

- Enhanced LCD operator with built-in copy function and parameter verify for A1000
- Soft Keys simplify operation and programming
- Optional LED operator available for A1000
- LCD contrast adjustment
- Simplified parameter grouping for easier navigation and set-up
- The A1000 has a new layout for faster parameter selection

Table 3 Digital Operator

GDP515/G5 Operator	New A1000 Operator
LCD Backlit Display 2 Line x 16 Characters	LCD Backlit Display 5 Line x 16 Characters New Button Layout Soft Keys (F1/F2) Smaller
	

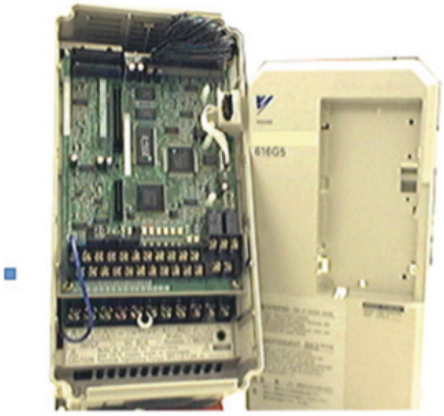
- A1000 copy keypad is capable of uploading all of the parameter settings from the A1000 drive memory.
  - Upload of GPD515/G5 parameters to the A1000 is not available.
  - A1000 drives must have the same software version, model, and control mode to copy parameters between A1000 drives.
- A Quick Start menu is added to aid in simple start up.
- The Quick Start menu consists of 26 parameters. The advanced menu offers full parameter access.
- There is a new button layout for quicker drive navigation.

Table 4 Menu Structure Comparison

GPD515/G5	A1000
Operation	Operation
—	Auto-Tuning
Programming (Quick Start, Basic, Advanced)	Programming
Modified Constants	Quick Settings
Auto-Tuning	Modified Constants
Initialize	Monitor Menu

4 Front Cover & Cooling Fan Comparison

GPD515/G5 - Front Cover (not split)



A1000 - Split Front Cover

The A1000 comes with a split cover to allow terminal only access. Limits exposure to control PCB and power structure during wiring.

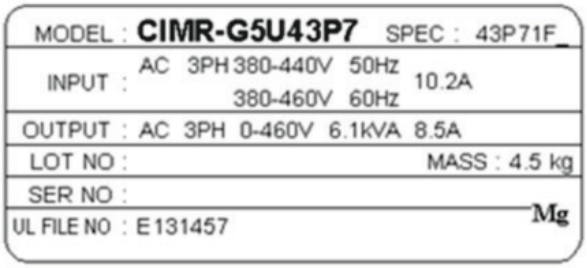
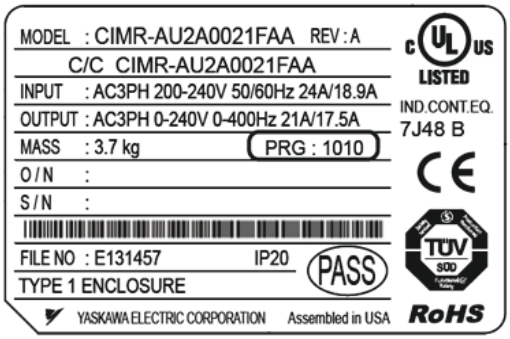
G5 Modular Cooling

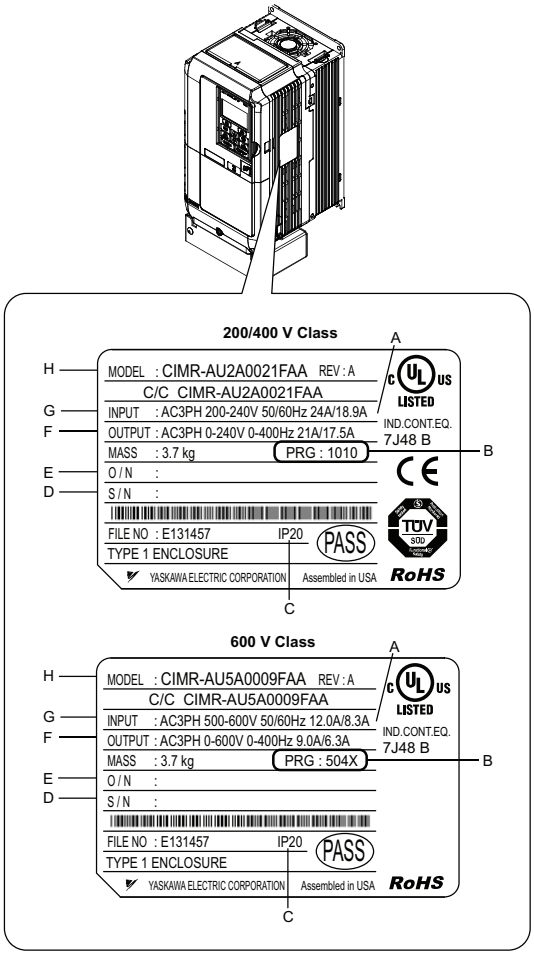
- The A1000 features an easy to remove top mounted heat sink fan.
- Fan operation is parameter controlled.
- Fan operation time can be monitored for preventative maintenance.

A1000 - New Modular Top-Mounted Cooling Fan

5 Nameplate/Labeling Differences

Table 5 Nameplates and Front Labels

GPD515/G5 Side Nameplate	A1000 Side Nameplate
	
GPD515/G5 Front Label	**A1000 Front Label**
	



A – Normal Duty Amps / Heavy Duty Amps
B – Software version <1>
C – Enclosure type
D – Serial number
E – Lot number
F – Output specifications
G – Input specifications
H – AC drive model

CIMR – A U 2 A 0021 F A A

- CIMR: Drive
- A: A1000 Series
- U: Region Code
- 2: Voltage Class
- A: Customized Specifications
- 0021: Refer to Appendix 1, Amperage and Carrier Tables.
- F: Enclosure Type
- A: Environmental Specification <1>
- A: Design Revision Order

No.	Region Code
U	USA

No.	Voltage Class
2	3-phase, 200-240 Vac
4	3-phase, 380-480 Vac
5	3-phase, 500-600 Vac

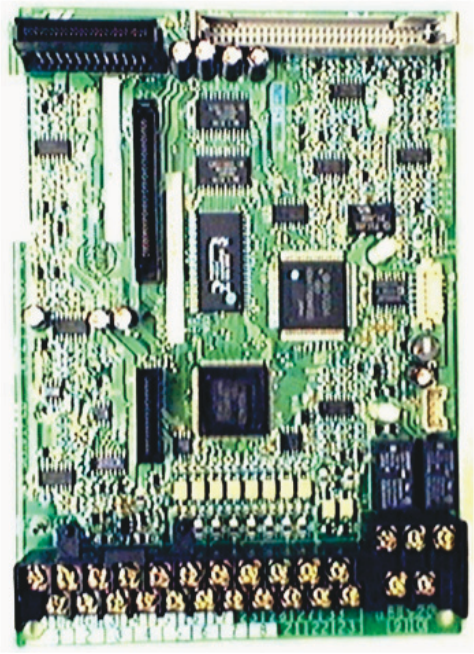
No.	Customized Specifications
A	Standard model

No.	Enclosure Type
A	IP00/Open Type
F	IP20/NEMA Type 1

No.	Environmental Specification <1>
A	Standard

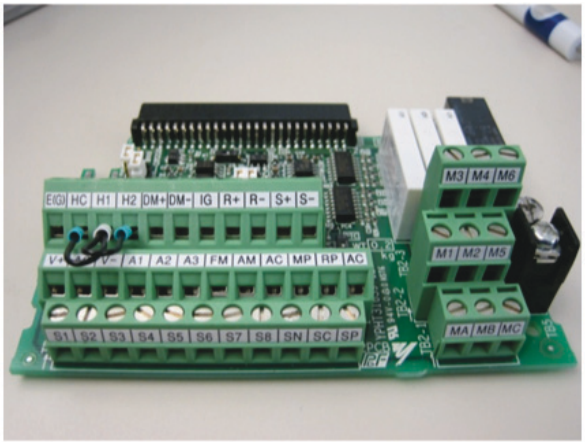
6 Main Control PCB Comparison

GPD515/G5 Control PCB



New A1000 Control PCB

A1000 Removable Terminal Board



◆ Terminal Board Set-Up Comparison

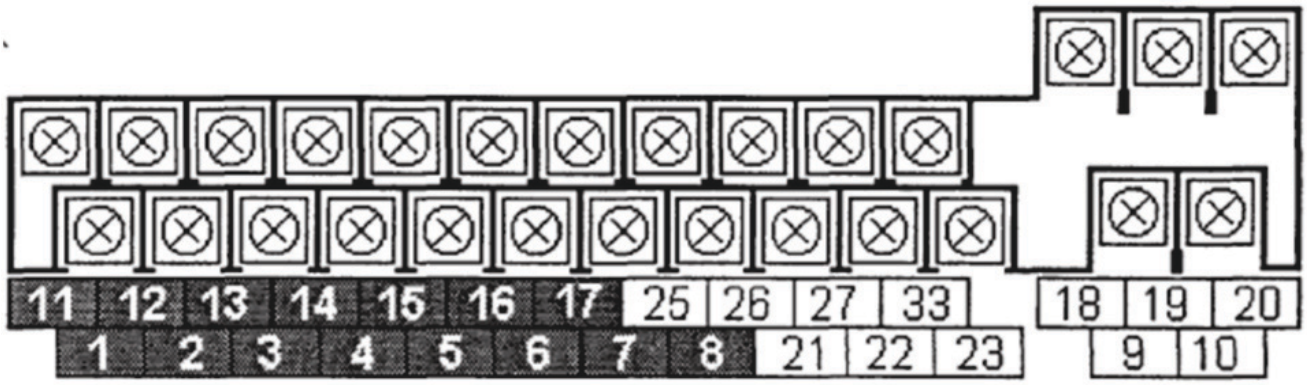


Figure 1 GPD515/G5 Terminal Board Configuration

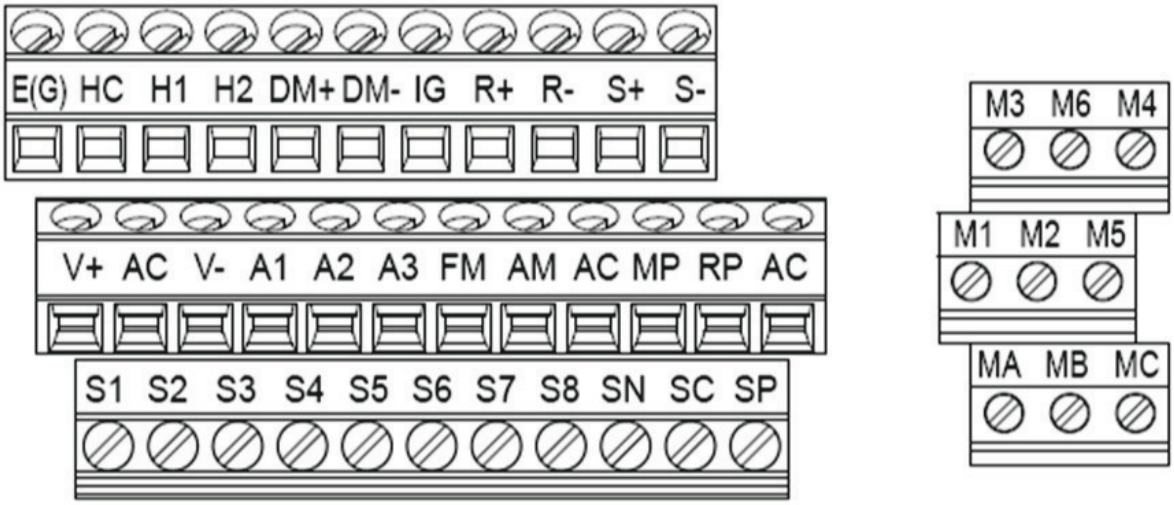


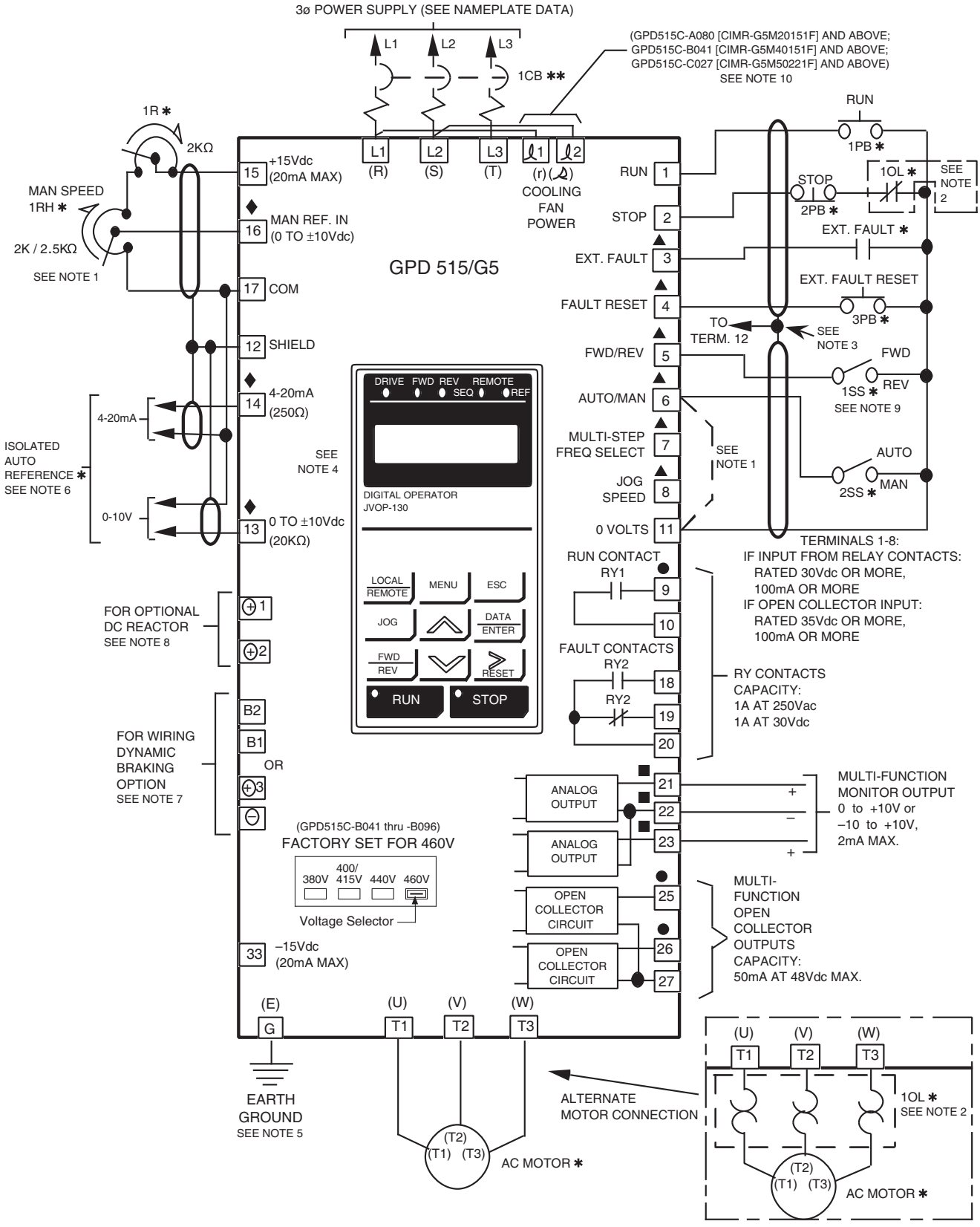
Figure 2 A1000 Terminal Board Configuration

Table 6 Factory Default Functions 2-Wire Control

GPD515/G5 Terminal			A1000 Terminal (Designations similar to GPD515/G5)		
Type	**GPD515/G5 Terminal**	**Default Functions**	**A1000 Terminal**	**Default Function**	**A1000 Description**
Digital Input Signals	1	Forward run/stop Signal level: (Photo-coupler insulated Input: +24 Vdc, 8 mA)	S1	Forward run/stop command	Multi-function inputs 1-8 Photocoupler 24 Vdc, 8 mA Set the S3 jumper to select between sinking, sourcing mode, and the power supply.
	2	Reverse run/stop	S2	Reverse run/stop command	
	3	External fault input	S3	External fault input	
	4	Fault reset input	S4	Fault reset	
	5	Master/Auxilary change Multi-step speed reference 1	S5	Multi-step speed reference 1 (Master/auxiliary switch)	
	6	Multi-step speed reference 2	S6	Multi-step speed reference 2	
	7	Jog reference	S7	Jog frequency reference	
	8	External baseblock	S8	External baseblock N.O.	
	11	Sequence control input common	SN	Digital input common	Multi-function input common
	—	—	SC	Factory connected to SP	24 Vdc Power Supply for Digital inputs, 150 mA max (only when not using digital input option DI-A3)
	—	—	SP	Factory connected to SC	

GPD515/G5 Terminal			A1000 Terminal (Designations similar to GPD515/G5)		
Type	**GPD515/G5 Terminal**	**Default Functions**	**A1000 Terminal**	**Default Function**	**A1000 Description**
Analog Input Signal	15	+15 V Power supply output for analog command (Allowable current 20 mA maximum)	+V	+10.5 Vdc power output	+10.5 Vdc (Maximum Current: 20mA)
	33	-15V Power supply output for analog command (Allowable current 20mA maximum)	-V	-10.5Vdc power output	-10.5Vdc (Maximum Current: 20 mA)
	13	Master frequency ref. (voltage) -10 to +10 V (20 kΩ) 0 to +10V (20 kΩ)	A1	Multi-function analog input 1 (Frequency reference bias)	-10 to 10 Vdc, 0 to 10 Vdc (Input impedance: 20 kΩ)
	14	Master frequency ref. (current) 4 to 20 mA (250 Ω)	A2	Multi-function analog input 2 (Frequency reference bias)	-10 to 10 Vdc, 0 to 10 Vdc (Input impedance: 20 kΩ) 4 to 20 mA, 0 to 20 mA (Input impedance: 250 kΩ) (Voltage or current input must be selected by DIP switch S1 and H3-09)
	16	Multi-function analog input -10 to +10 V (20 kΩ), 0 to +10 V (20 kΩ)	A3	Multi-function analog input 3 (Auxiliary frequency reference), PTC input	-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kΩ) Use DIP switch S4 on the terminal board to select between analog and PTC input.
	17	Common for control circuit 0 V	AC	Analog frequency reference common	0 V
	12	Connection to shield sheath of signal lead	E(G)	Shield wire, optional ground line connection point	–
Digital Output Signals	9	During running (NO contact) Dry contact capacity: 250 Vac, 1 A or less 30 Vdc, 1 A or less	M1	During run (N.O. contact)	Form A dry contact capacity: 1 A maximum at 250 Vac 1 A maximum at 30 Vdc Multi-function digital output. Function set by H2-01.
	10		M2		
	25	Zero speed detection Open collector output 48 V, 50 mA or less	M3	Zero speed (N.O. contact)	Form A dry contact capacity: 1 A maximum at 250 Vac 1 A maximum at 30 Vdc Multi-function digital output. Function set by H2-02.
	27	Open collector output common	M4		
	26	Speed agree detection Open collector output 48 V, 50 mA or less	M5	Frequency agree (N.O. contact)	Form A Dry contacts capacity: 1 A maximum at 250 Vac 1 A maximum at 30 Vdc Multi-function digital output. Function set by H2-03.
	27	Open collector output common	M6		
	18	Fault contact output (NO/NC contact) When faulted : Closed between terminals 18 and 20, Open between terminals 19 and 20. Dry contact capacity: 250 Vac 1 A or less, 30 V 1 A or less	MA	Fault output signal (SPDT)	Form C dry contact capacity: 1 A maximum at 250 Vac 1 A maximum at 30 Vdc
	19		MB		
	20		MC		
Analog Output Signals	21	Frequency meter output 0 to 10 V, 2 mA or less	FM	Output frequency (Multi-function)	0 to +10 Vdc or +/-10 Vdc 500 ohm input 10 V=100 % Output frequency (Maximum current 2 mA). 4 to 20 mA 20 mA = 100 % Output frequency, Function set by H4-01.
	23	Current monitor 5 V = inverter rated current, 2 mA or less	AM	Output current (Multi-function)	
	22	Common (Current Monitor)	AC	Analog common	–
Pulse I/O	—	—	RP	Pulse input	0 to 32 kHz (3 kΩ) ±5 % High level voltages 3.5 to 13.2 Low level voltages 0.0 to 0.8 Duty Cycle (on/off) 30 % to 70 %, function set by H6-01.
	—	—	MP	Pulse monitor	0 to 32 kHz +5 V output (Load: 1.5 kΩ) Function set by H6-06.

GPD515/G5 Terminal			A1000 Terminal (Designations similar to GPD515/G5)		
Type	**GPD515/G5 Terminal**	**Default Functions**	**A1000 Terminal**	**Default Function**	**A1000 Description**
RS-485/422	—	—	R+	MEMOBUS/Modbus Communication (RS485/422) Max 115.2 kBps	–
	—	—	R-		
	—	—	S+	MEMOBUS/Modbus Communication (RS485/422) Max 115.2 kBps	
	—	—	S-		
	—	—	IG	Signal common	–
Safe Diable Inputs	—	—	H1	Safe Disable Input 1	24 Vdc, 8 mA One or both open: Output disabled Both closed: Normal operation Internal impedance: 3.3 kΩ Off time of at least 1 ms Disconnect the wire jumpers shorting terminals H1, H2, and HC to use the Safe Disable inputs. Set the S5 jumper to select between sinking, sourcing mode, and the power supply.
	—	—			
	—	—	H2	Safe Disable Input 2	
	—	—			
	—	—	HC	Safe Disable Function Common	



BASIC INTERCONNECT DIAGRAM FOR 3-WIRE CONTROL

Figure 3 GPD515/G5 Connection Diagram

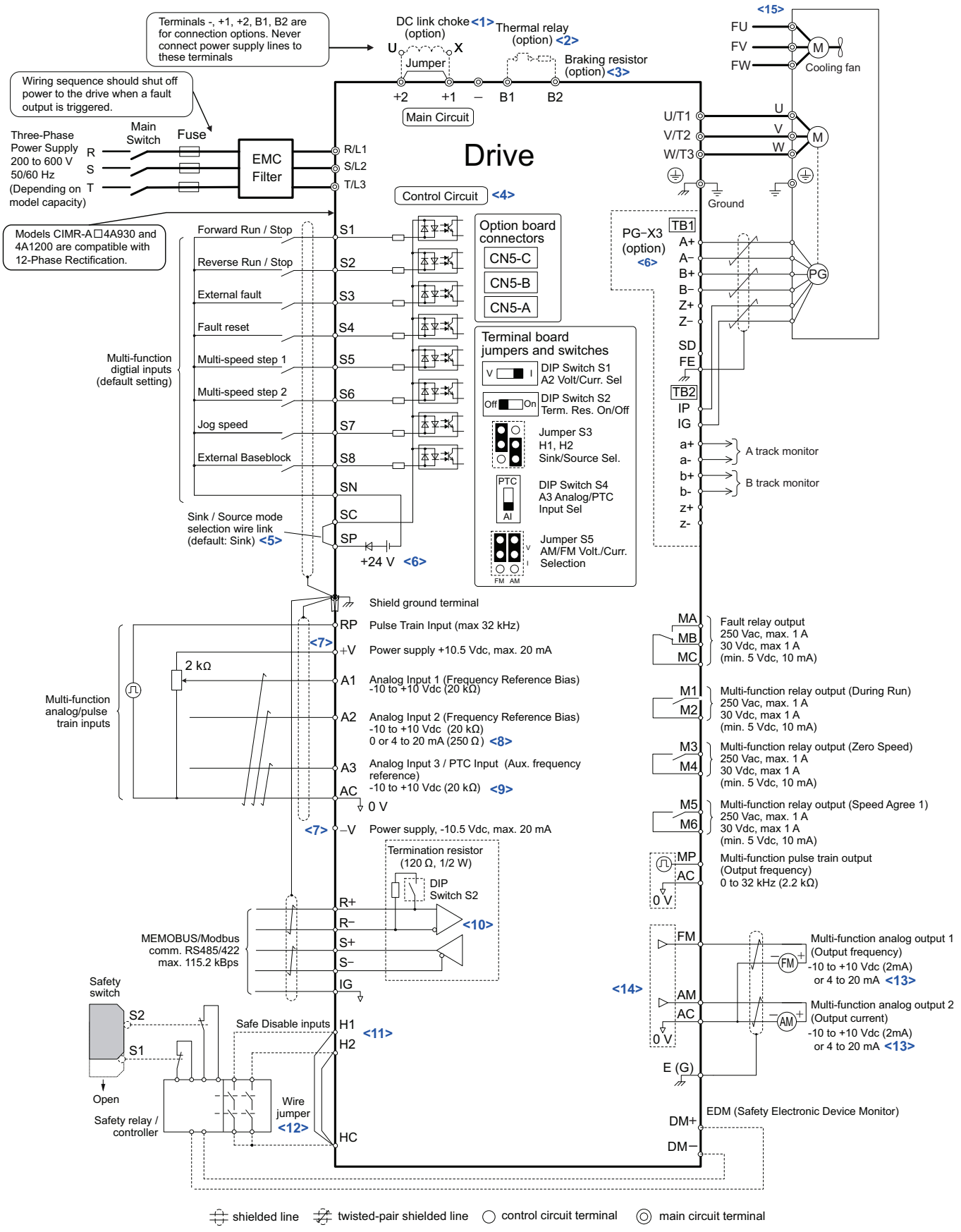


Figure 4 A1000 Connection Diagram

7 A1000 Drive Options

Category	Option Name	Model Number
Network Communication	Profibus-DP	SI-P3
	DeviceNet	SI-N3
	Mechatrolink	SI-T3
	EtherNet/IP	SI-EN3
	Modbus TCP/IP	SI-EM3
	ProfiNET	SI-EP3
Motor Feedback	Line Driver PG	PG-X3
	Open Collector PG	PG-B3
	Serial Absolute FB	FG-F3
	Resolver Feedback	PG-RT3
Input/Output	Analog Input	AI-A3
	Analog Output	AO-A3
	Digital Input	DI-A3
	Digital Output	DO-A3
	120 Vac Interface Board	(Contact factory)
Keypad	LCD Keypad	JVOP-180
	LED Keypad	JVOP-182
	Remote Mount Keypad Kit - Blank	UUX000526
	Remote Mount Keypad Kit - YEA	UUX000527
	LCD Operator Extension Cable, 1 m	UWR0051
	LCD Operator Extension Cable, 3 m	UWR0052
Control Power Unit	24 V Control Power Unit	PS-A10H for 480 V and 600 V class
		PS-A10L for 240 V class
Parameter Management	Y-Stick USB Copy Unit	JVOP-181
	Drive Wizard Pro PC Support Tool	DriveWizard Industrial
	PC Support Tool Cable	UWR0638 USB Cable, 10 ft, male A-type to male B-type
DriveWorksEZ	DriveWorksEZ Std	(Contact factory)
	DriveWorksEZ Pro	(Contact factory)

8 Details on New A1000 Features and Functions

Note: This section details significant A1000 features.

◆ Over-Excitation Braking

This braking method allows for faster stops without the addition of a dynamic braking resistor. While still not as fast or powerful as DB, it offers a very necessary middle ground for those applications that may not require the full power of dynamic braking, saving money in hardware.

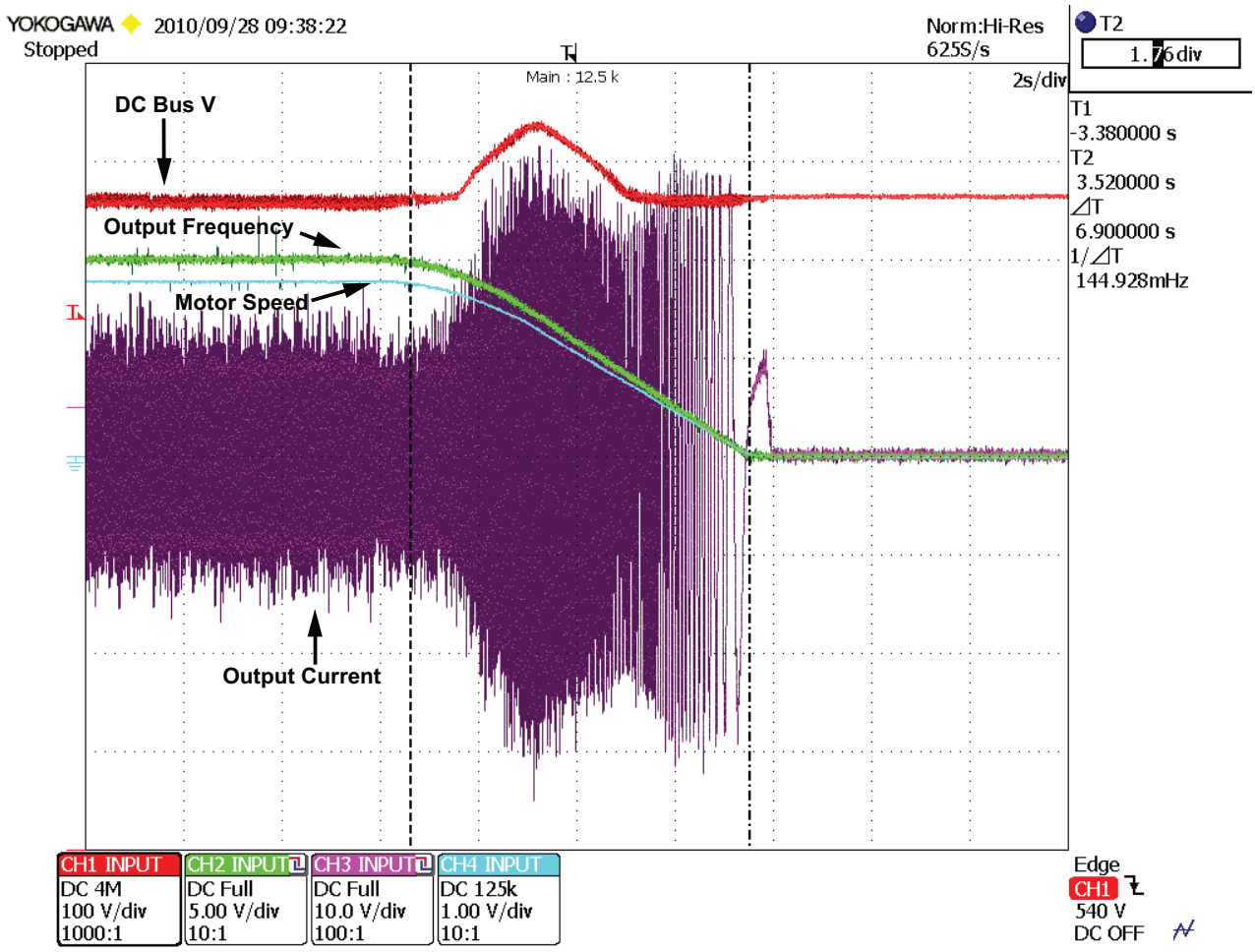


Figure 5 Over-Excitation Braking

◆ Self-Activated KEB

Internally activated Kinetic Energy Braking eliminates the need for external voltage sensing relays. Load inertia is used to decelerate the system in a controlled manner in the event of power loss. Extremely fast scan rates accommodate loads near 100 %.

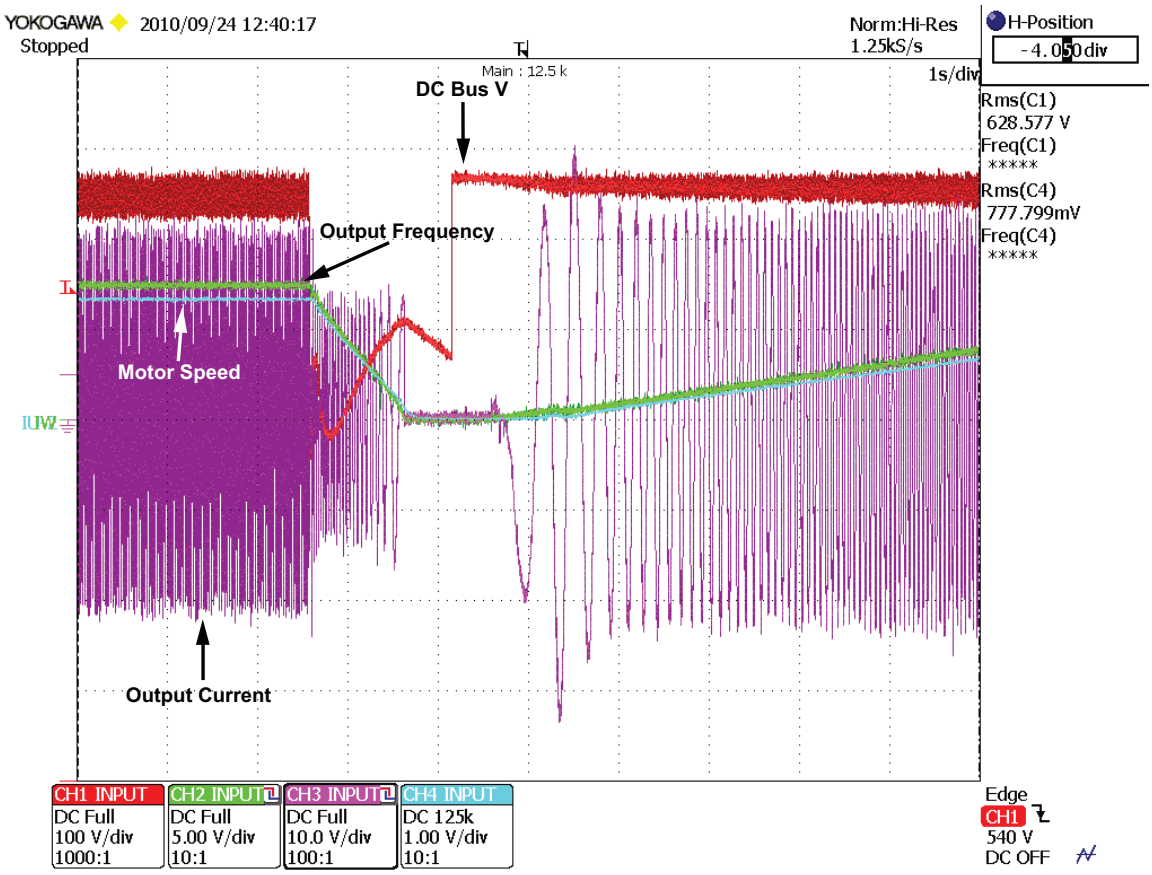


Figure 6 Self-Activated KEB

◆ Bidirectional Speed Search

Multiple speed search methods to accommodate nearly any application. Bumpless synchronization with reverse motor rotation is easily accomplished with Speed Estimation Speed Search.

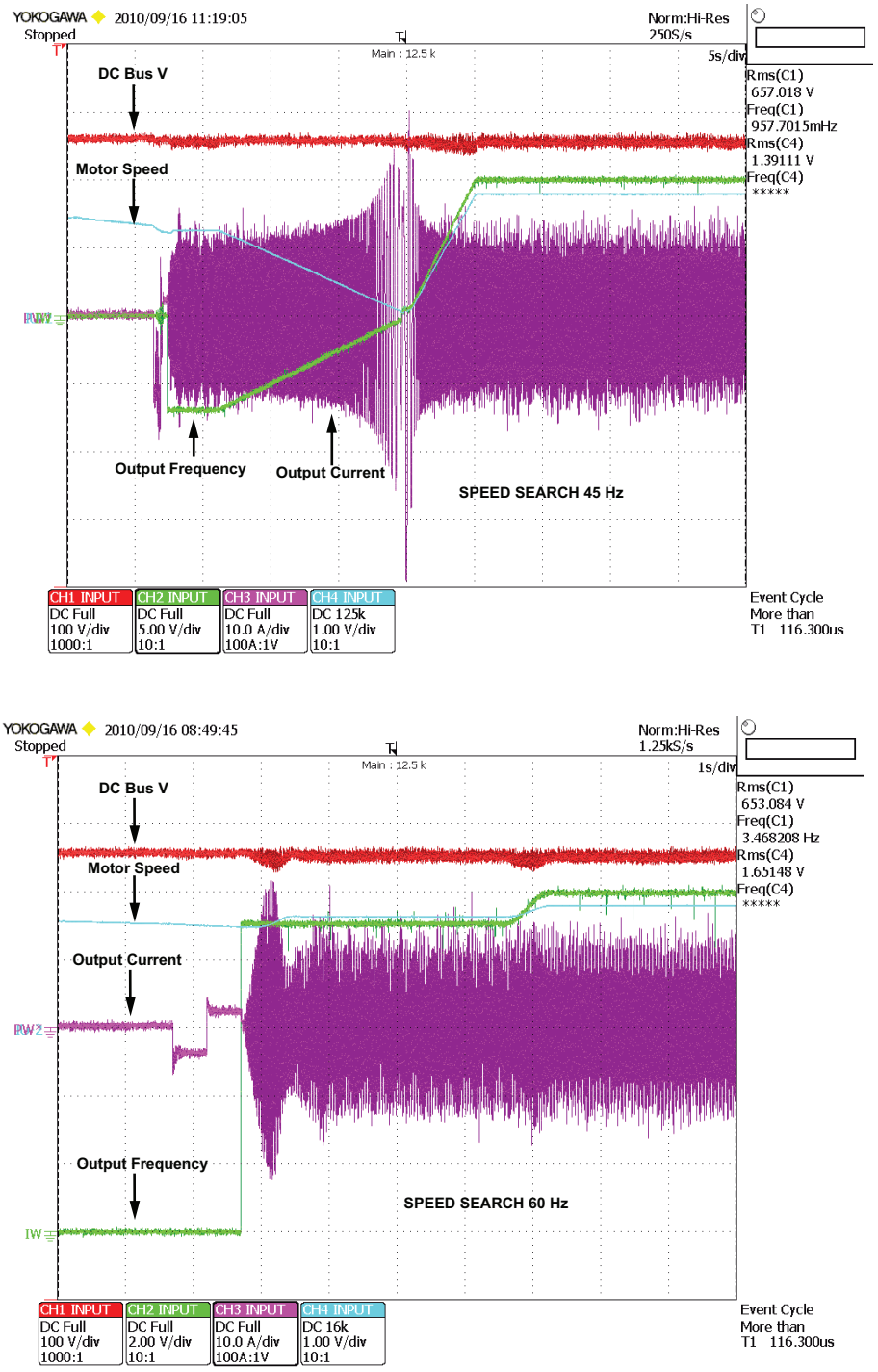


Figure 7 Bi-Directional Speed Search

◆ Top Mounted Easily Removable Cooling Fan

The heatsink fan is located on the top of the drive which improves the ease of replacement. With a tooless removal process, faulty fans are easily replaced.

◆ New “Heavy Duty” and “Normal Duty” Ratings for the A1000

The drive’s capacity is rated for two types of load characteristics, Heavy Duty (HD) and Normal Duty (ND). The table below explains the drive characteristics for HD and ND ratings. Parameter C6-01 affects the drives carrier frequency setting, and in certain models, the value of 100 % output current rating is also affected.

Table 7 Drive Selections

C6-01 Setting	Carrier Frequency	Output Current Ratings	Overload Capacity	Maximum Output Frequency
0: Heavy Duty	2 kHz (default) Can be increased w/o derate (Refer to Appendix 1)	HD nameplate rating	150 %	400 Hz
1: Normal Duty (A1000 default)	2 kHz (default) Can be increased with derate (Refer to Appendix 1)	ND nameplate rating ND rating is > HD rating (On certain models, see ratings table)	120 %	400 Hz

Table 8 C6-01 Heavy/Normal Duty Setting

Product	C6-01 Heavy/Normal Duty Setting

New A1000	**C6-01 Drive Duty Selection Setting**
	0: Heavy Duty
	• Rated output current is the HD (Heavy Duty) rating on drive nameplate.
	• Overload capacity is 150 % for 1 minute.
	• Carrier frequency is defaulted to 2 kHz but can be increased to 8 kHz or 5 kHz w/o derating on certain models (Refer to Appendix 1)
	• Carrier frequency is automatically reduced when:
	  • output frequency is < 6.0 Hz and current is >100 %
	  • output frequency is > 6.0 Hz and current is > 112 %
	• Maximum output frequency is 400 Hz (except on larger models)
	• L8-15: OL2 Characteristic selection@low speed (=1 Enabled) expedites OL2 at low output frequencies below 6 Hz.
	1: Normal Duty (default)
	• Output current is ND (Normal Duty) rating on drive nameplate.
	• Overload capacity is 120 % for 1 minute.
	• Carrier frequency is defaulted to Swing PWM (2kHz) but can be increased with derating on most models (Refer to Appendix 1)
	• Carrier is automatically reduced when:
	  • output frequency is < 6.0 Hz and current is >100 %
	  • output frequency is > 6.0 Hz and current is > 112 %
	• Maximum output frequency is 400 Hz (except on certain larger models)
	• L8-15: OL2 Characteristic selection@low speed (=1 Enabled) expedites OL2 at low output frequencies below 6 Hz.

GPD515/G5	**Similar to Normal Duty, but with 150 % OL** • Singular output current value on nameplate. • Overload capacity is 150 % for 1 minute. • Full range carrier adjustment C6-02. • Drive must be derated when carrier is set above default, software protected by OL2. • Maximum output frequency is 400 Hz. • L8-15: Characteristic selection @ low speed (=1 Enabled) expedites OL2.

9 Appendix 1 Ratings

◆ Output Amps, Carrier and Overload Comparison

Table 9 240 V Heavy Duty Ratings

240 V Heavy Duty									
		A1000 (C6-01 = 0)				GPD515/G5 Model			
NEC HP 230 V	NEC Amps	A1000 Model CIMR-AU2A	Output Amps Heavy Duty	Fc kHz Heavy Duty <1>	Overload % Heavy Duty	G5 Model CIMR-G5U	Output Amps Heavy Duty	Fc kHz Heavy Duty	OL % Heavy Duty
0.5	2.2	0004	3.2	2 (8)	150	20P41	3.2	15	150
0.75	3.2								
1	4.2	0006	5	2 (8)	150	20P71	6	15	150
1.5	6	0008	6.9	2 (8)	150				
2	6.8	0010	8			21P51	8	15	150
3	9.6	0012	11	2 (8)	150	22P21	11	15	150
		0018	14	2 (8)	150				
5	15.2	0021	17.5	2 (8)	150	23P71	17.5	15	150
7.5	22	0030	25	2 (8)	150	25P51	25	15	150
10	28	0040	33	2 (8)	150	27P51	33	15	150
15	42	0056	47	2 (8)	150	20111	49	15	150
20	54	0069	60	2 (8)	150	20151	64	15	150
25	68	0081	75	2 (8)	150	20181	80	15	150
30	80	0110	85	2 (8)	150				
						20221	96	10	150
40	104	0138	115	2 (5)	150	20300	130	10	150
50	130	0169	145	2 (5)	150				
60	154	0211	180	2 (5)	150	20370	160	10	150
75	192	0250	215	2 (5)	150	20550	224	10	150
100	248	0312	283	2 (5)	150	20750	300	10	150
125	312	0360	346	2 (5)	150	N/A	N/A	N/A	N/A
150	360	0415	415	2 (5)	150	N/A	N/A	N/A	N/A

<1> Carrier setting in parenthesis indicates maximum value without derating (applies to HD rating only).

Table 10 240 V Normal Duty Ratings

240 V Normal Duty									
		A1000 (C6-01 = 1)				GPD515/G5			
NEC HP 230 V	NEC Amps	A1000 Model CIMR-AU2A	Output Amps Normal Duty	Fc kHz Normal Duty	Overload % Normal Duty	GPD515/G5 Model CIMR-G5U	Output Amps Normal Duty	Fc kHz Normal Duty	Overload % Normal Duty
0.5	2.2	0004	3.5	2 (SPWM)	120	20P41	3.2	15	150
0.75	3.2								
1	4.2	0006	6	2 (SPWM)	120	20P71	6	15	150
1.5	6								
2	6.8	0008	8	2 (SPWM)	120	21P51	8	15	150

240 V Normal Duty									
		A1000 (C6-01 = 1)				GPD515/G5			
NEC HP 230 V	NEC Amps	A1000 Model CIMR-AU2A	Output Amps Normal Duty	Fc kHz Normal Duty	Overload % Normal Duty	GPD515/G5 Model CIMR-G5U	Output Amps Normal Duty	Fc kHz Normal Duty	Overload % Normal Duty
3	9.6	0010 0012	9.6 12	2 (SPWM)	120	22P21	11	15	150
5	15.2	0018	17.5	2 (SPWM)	120	23P71	17.5	15	150
7.5	22	0021	21	2 (SPWM)	120	25P51	25	15	150
10	28	0030	30	2 (SPWM)	120	27P51	33	15	150
15	42	0040	40	2 (SPWM)	120	20111	49	15	150
20	54	0056	56	2 (SPWM)	120	20151	64	15	150
25	68	0069	69	2 (SPWM)	120	20181	80	15	150
30	80	0081	81	2 (SPWM)	120	20221	96	10	150
40	104	0110	110	2 (SPWM)	120	20300	130	10	150
50	130	0138	138	2 (SPWM)	120				
60	154	0169	169	2 (SPWM)	120	20370	160	10	150
75	192	0211	211	2 (SPWM)	120	20550	224	10	150
100	248	0250	250	2 (SPWM)	120	20750	300	10	150
125	312	0312	312	2 (SPWM)	120	N/A	N/A	N/A	N/A
150	360	0360	360	2 (SPWM)	120	N/A	N/A	N/A	N/A
175	360	0415	415	2 (SPWM)	120	N/A	N/A	N/A	N/A

Table 11 480 V Heavy Duty Ratings

480 V Heavy Duty									
		A1000 (C6-01 = 0)				GPD515/G5			
NEC HP 460 V	NEC Amps	A1000 Model CIMR-AU4A	Output Amps Heavy Duty	Fc kHz Heavy Duty <1>	Overload % Heavy Duty	GPD515/G5 Model CIMR-G5U	Output Amps Heavy Duty	Fc kHz Heavy Duty	Overload % Heavy Duty
0.5	1.1	0002	1.8	2 (8)	150	40P41	1.8	10	150
0.75	1.6								
1	2.1	0004	3.4	2 (8)	150	40P71	3.4	10	150
1.5	3								
2	3.4								
3	4.8	0005 0007	4.8 5.5	2 (8)	150	41P51	4.8	10	150
5	7.6	0009	7.2	2 (8)	150	43P71	8	10	150
		0011	9.2	2 (8)	150				
7.5	11	0018	14.8	2 (8)	150	44P01	11	10	150
10	14	0023	18	2 (8)	150	45P51	14	10	150
15	21	0031	24	2 (8)	150	47P51	21	10	150
20	27	0038	31	2 (8)	150	40111	27	10	150
25	34	0044	39	2 (8)	150	40151	34	10	150
30	40	0058	45	2 (8)	150	40181	41	10	150
40	52	0072	60	2 (8)	150	40221	52	8	150
50	65	0088	75	2 (8)	150	40301	65	8	150

480 V Heavy Duty									
NEC HP 460 V	NEC Amps	A1000 (C6-01 = 0)				GPD515/G5			
		A1000 Model CIMR-AU4A	Output Amps Heavy Duty	Fc kHz Heavy Duty <1>	Overload % Heavy Duty	GPD515/G5 Model CIMR-G5U	Output Amps Heavy Duty	Fc kHz Heavy Duty	Overload % Heavy Duty
60	77	0103	91	2 (8)	150	40371	80	6	150
75	96	0139	112	2 (5)	150	40451	96	6	150
100	124	0165	150	2 (5)	150	40551	128	6	150
125	156	0208	180	2 (5)	150	40750	165	6	150
150	180	0250	216			41100	224	5	150
200	240	0296	260	2 (5)	150				
250	302	0362	304	2 (5)	150	41600	302	5	150
300	361	0414	370	2 (5)	150	41850	380	2	150
350	414	0515	450	2 (2)	150	42200	450	2	150
400	477	0675	605	2 (2)	150	43000	605	2	150
500	590								
650	780	0930	810	2 (2)	150	N/A	N/A	N/A	N/A
900	1080	1200	1090	2 (2)	150	N/A	N/A	N/A	N/A

<1> Carrier setting in parenthesis indicates maximum without derating (applies to HD rating only).

Table 12 480 V Normal Duty Ratings

480 V Normal Duty									
NEC HP 460 V	NEC Amps	A1000 (C6-01=1)				GPD515/G5			
		A1000 Model CIMR-AU4A	Output Amps Normal Duty	Fc kHz Normal Duty	Overload % Normal Duty	GPD515/G5 Model CIMR-G5U	Output Amps Normal Duty	Fc kHz	Overload % Normal Duty
0.5	1.1	0002	2.1	2 (SPWM)	120	40P41	1.8	10	150
0.75	1.6								
1	2.1	0004	4.1	2 (SPWM)	120	40P71	3.4	10	150
1.5	3								
2	3.4								
3	4.8	0005	5.4	2 (SPWM)	120	41P51	4.8	10	150
		0007	6.9						
5	7.6	0009	8.8	2 (SPWM)	120	43P71	8	10	150
7.5	11	0011	11.1	2 (SPWM)	120	44P01	11	10	150
10	14	0018	17.5	2 (SPWM)	120	45P51	14	10	150
15	21	0023	23	2 (SPWM)	120	47P51	21	10	150
20	27	0031	31	2 (SPWM)	120	40111	27	10	150
25	34	0038	38	2 (SPWM)	120	40151	34	10	150
30	40	0044	44	2 (SPWM)	120	40181	41	10	150
40	52	0058	58	2 (SPWM)	120	40221	52	8	150
50	65	0072	72	2 (SPWM)	120	40301	65	8	150
60	77	0088	88	2 (SPWM)	120	40371	80	6	150
75	96	0103	103	2 (SPWM)	120	40451	96	6	150
100	124	0139	139	2 (SPWM)	120	40551	128	6	150

480 V Normal Duty									
NEC HP 460 V	NEC Amps	A1000 (C6-01=1)				GPD515/G5			
		A1000 Model CIMR-AU4A	Output Amps Normal Duty	Fc kHz Normal Duty	Overload % Normal Duty	GPD515/G5 Model CIMR-G5U	Output Amps Normal Duty	Fc kHz	Overload % Normal Duty
125	156	0165	165	2 (SPWM)	120	40750	165	6	150
150	180	0208	208	2 (SPWM)	120	41100	224	5	150
200	240	0250	250	2 (SPWM)	120	41600	302	5	150
250	302	0296	296	2 (SPWM)	120				
300	361	0362	362	2 (SPWM)	120	41850	380	2	150
						42200	450	2	150
350	414	0414	414	2 (SPWM)	120				
400	477	0515	515	2 (SPWM)	120	43000	605	2	150
450	515								
500	590	0675	675	2 (SPWM)	120				
600	—					N/A	N/A	N/A	N/A
800	—	0930	930	2 (SPWM)	120	N/A	N/A	N/A	N/A
1000	—	1200	1200	2 (SPWM)	120	N/A	N/A	N/A	N/A

Table 13 600 V Heavy Duty Ratings

600 V Heavy Duty Setting									
NEC HP 575 V	NEC Amps	A1000 (C6-01 = 0)				GPD515/G5			
		A1000 Model CIMR-AU5A	Output Amps	Fc kHz	Overload % Normal Duty	GPD515/G5 Model CIMR-G5U	Output Amps	Fc kHz	Overload %
1	1.7	0003	1.7	2	150	51P51	3.5	10	150
2	2.7	0004	3.5	2	150				
3	3.9	0006	4.1	2	150	52P21	4.1	10	150
5	6.1	0009	6.3	2	150	53P71	6.3	10	150
7.5	9	0011	9.8	2	150	55P51	9.8	10	150
10	11	0017	12.5	2	150	57P51	12.5	10	150
15	17	0022	17	2	150	50111	17	10	150
20	22	0027	22	2	150	50151	22	10	150
25	27	0032	27	2	150	50181	27	10	150
30	32	0041	32	2	150	50221	32	10	150
40	41	0052	41	2	150	50301	41	10	150
50	52	0062	52	2	150	50371	52	10	150
60	62	0077	62	2	150	50451	62	10	150
75	77	0099	77	2	150	50551	77	10	150
100	99	0125	99	2	150	50751	99	2	150
125	125	0145	130	2	150	50900	130	2	150
150	144	0192	172	2	150	51100	172	2	150
200	192	0242	200	2	150	51600	200	2	150

Table 14 600 V Normal Duty Ratings

600 V Norman Duty									
NEC HP 600V	NEC Amps	A1000 (C6-01 = 0)				GPD515/G5			
		A1000 Model CIMR-AU5A	Output Amps	Fc kHz	Overload % Normal Duty	GPD515/G5 Model CIMR-G5U	Output Amps	Fc kHz	Overload %
2	2.7	0003	2.7	<1>	120	51P51	3.5	10	150
3	3.9	0004	3.9	<1>	120	52P21	4.1	10	150
5	6.1	0006	6.1	<1>	120	53P71	6.3	10	150
7.5	9	0009	9	<1>	120	55P51	9.8	10	150
10	11	0011	11	<1>	120	57P51	12.5	10	150
15	17	0017	17	<1>	120	50111	17	10	150
20	22	0022	22	<1>	120	50151	22	10	150
25	27	0027	27	<1>	120	50181	27	10	150
30	32	0032	32	<1>	120	50221	32	10	150
40	41	0041	41	<1>	120	50301	41	10	150
50	52	0052	52	<1>	120	50371	52	10	150
60	62	0062	62	<1>	120	50451	62	10	150
75	77	0077	77	<1>	120	50551	77	10	150
100	99	0099	99	<1>	120	50751	99	2	150
125	125	0125	0125	<1>	120	50900	130	2	150
150	144	0145	0145	<1>	120	51100	172	2	150
200	192	0242	0242	<1>	120	51600	200	2	150
250	242	242	242	<1>	120	—	—	—	—

<1> The A1000's default ND (normal duty) carrier frequency is a 2 kHz Swing PWM.

◆ Drive Derate Charts

■ Carrier Frequency Derate

240 Volt Class Drives

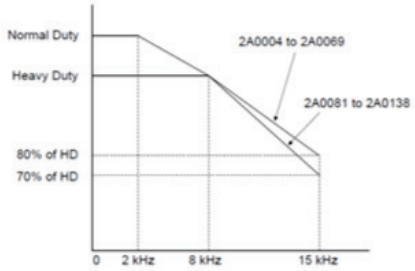


Figure 8 Carrier Frequency Derating (CIMR-A□2A0004 to 2A0138)

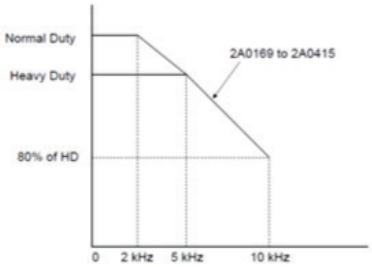


Figure 9 Carrier Frequency Derating (CIMR-A□2A0169 to 2A0415)

480 Volt Class Drives

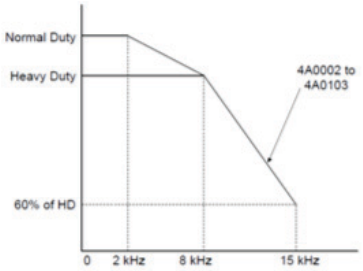


Figure 10 Carrier Frequency Derating (CIMR-A□4A0002 to 4A0103)

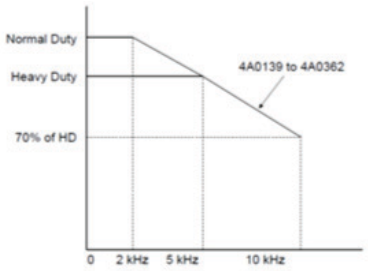


Figure 11 Carrier Frequency Derating (CIMR-A□4A0139 to 4A0362)

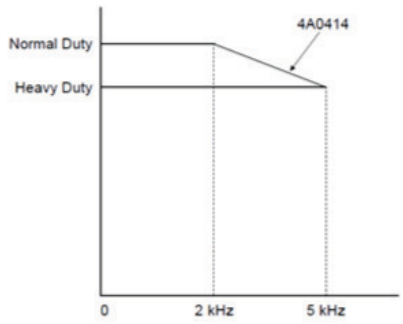


Figure 12 Carrier Frequency Derating (CIMR-A□4A0414)

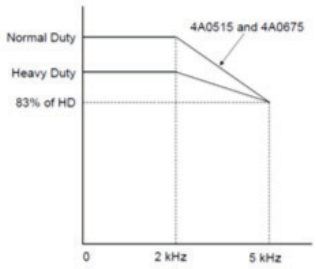


Figure 13 Carrier Frequency Derating (CIMR-A□4A0515 to 4A0675)

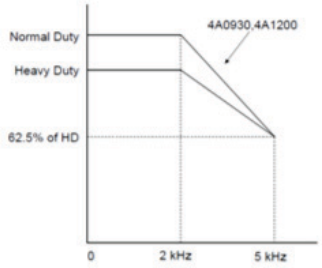


Figure 14 Carrier Frequency Derating (CIMR-A□4A0930 to 4A1200)

600 Volt Class Drives

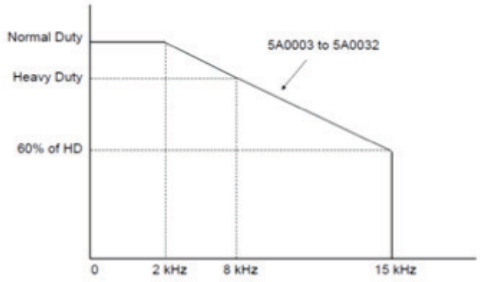


Figure 15 Carrier Frequency Derating (CIMR-A□5A0003 to 5A0032)

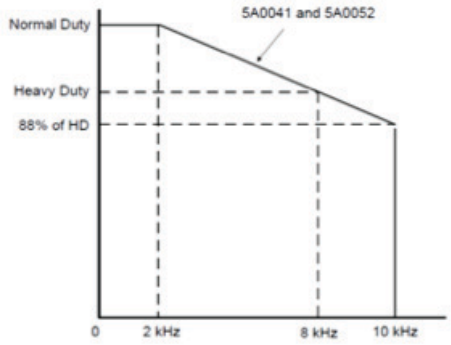


Figure 16 Carrier Frequency Derating (CIMR-A☐5A0041 to 5A0052)

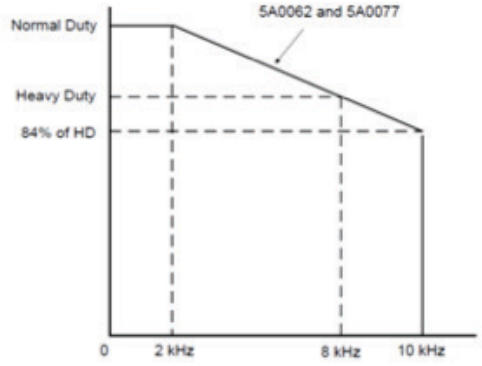


Figure 17 Carrier Frequency Derating (CIMR-A☐5A0062 to 5A0077)

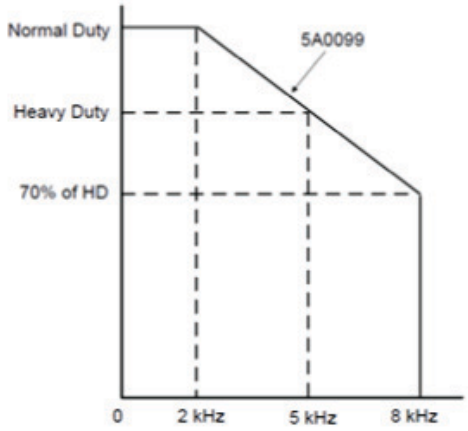


Figure 18 Carrier Frequency Derating (CIMR-A☐5A0099)

■ Temperature Derating

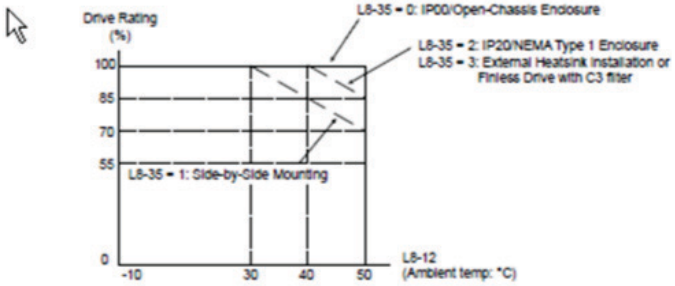


Figure 19 Temperature Derating

■ Altitude Derating

The drive standard ratings are valid for installation altitudes up to 1000 m. For installations from 1000 m to 3000 m, the drive rated output current must be derated for 1 % per 100 m above 1000 m.

■ Dimensions

Table 15 240 V Open-Chassis Models (IP00)

NOTE:
Unshaded A1000 cells show drives that are provided with standard NEMA Type 1/IP20 enclosures. Remove the conduit box and top cover plate to convert these drives to Open-Chassis/IP00 enclosure type, then use the Open-Chassis dimensions provided in this table.

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-	Outer Dimensions (in)					
			GPD515/G5			A1000		
			W	H	D	W	H	D
3-Phase 240 V Class	20P41	2A0004	5.51	11.02	6.3	5.51	10.24	5.79
	20P71	2A0006						
		2A0008						
	21P51							
		2A0010						
	22P21	2A0012			7.09			6.46
		2A0018						
	23P71	2A0021						
	25P51	2A0030	7.87	11.81	8.07			6.57
	27P51	2A0040						
	20111	2A0056	9.84	14.96	8.86	7.09	11.81	7.36
	20151	2A0069		15.75		8.66	13.78	7.76
	20181	2A0081	12.99	24.02	11.22			
		2A0110				10	15.75	10.16
	20221			26.57				
	20300	2A0138	16.73	26.57	13.78	10.98	17.72	10.16
		2A0169				12.95	21.65	11.14
	20370	2A0211						
	20550	2A0250	18.7	31.5		17.95	27.76	12.99
	20750	2A0312	22.64	36.42	15.75			
	—	2A0360	—	—	—	19.84	31.5	13.78
	—	2A0415	—	—	—			

Table 16 480 V Open-Chassis Models IP00

NOTE:
Unshaded A1000 cells show drives that are provided with standard NEMA Type 1/IP20 enclosures. Remove the conduit box and top cover plate to convert these drives to Open-Chassis/IP00 enclosure type, then use the Open-Chassis dimensions provided in this table.

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-AU	Outer Dimensions (in)					
			GPD515/G5			A1000		
			W	H	D	W	H	D
3-Phase 480 V Class	40P41	4A0002	5.51	11.02	6.3	5.51	10.24	5.79
	40P71	4A0004						
	41P51	4A0005			7.09			
		4A0007						6.46
	43P71	4A0009						
		4A0011						
	44P01	4A0018						6.57
	45P51	4A0023	7.87	11.81	8.07			
	47P51	4A0031				7.09	11.81	
	40111	4A0038	9.84	14.96	8.86			7.36
	40151	4A0044				8.66	13.78	7.76
	40181	4A0058	12.99	24.02	11.22	10	15.75	10.16
	40221	4A0072				10.98	17.72	
	40301	4A0088		30.91		12.95	20.08	
	40371	4A0103						
	40451	4A0139		33.46			21.65	11.14
	40551	4A0165	17.91	32.28	13.78			
	40750	4A0208				17.72	27.76	12.99
	41100		22.64	36.42	14.76	19.69	31.5	13.78
		4A0250						
	41600	4A0296			15.75			
		4A0362						
	41850	4A0414	37.4	57.09	17.13		37.4	14.57 This dimension applies to all larger models.
	42200	4A0515				26.38	44.88	
	43000	0675	37.8	62.99	17.91			
	—	0930	—	—	—	49.21	54.33	
	—	1200	—	—	—			

Table 17 600 V Open Chassis/IP00

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-AU	Outer Dimensions (in)					
			GPD515/G5			A1000		
			W	H	D	W	H	D
3-Phase 600 V Class	51P51	5A0003	5.51	11.02	7.08	5.51	10.24	5.79
		5A0004						
	52P21	5A0006						6.46
	53P71	5A0009	7.87	11.81	8.07			
	55P51	5A0011						6.57
	57P51	5A0017				7.09	11.81	7.36
	50111	5A0022	9.84	14.96	8.85			
	50151	5A0027				8.66	13.78	7.76
	50181	5A0032	15.75	29.53	11.22			
	50221	5A0041				10.98	17.72	10.16
	50301	5A0052	22.64	33.47	11.81			
	50371	5A0062				12.95	21.65	11.14
	50451	5A0077						
	50551	5A0099		41.34	12.8			
	50751	—		41.97		—	—	—
	50900	—		49.21	12.99	—	—	—
	51100	—		62.99	13.98	—	—	—
	51600	—				—	—	—

Table 18 240 V NEMA Type 1/IP20

NOTE:
A1000 models noted with cell shading are provided as standard with Open/IP00 Protected Chassis. Order the appropriate NEMA Type 1/IP20 end cap kit when NEMA Type 1/IP20 is required for these models.

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-AU	Outer Dimensions (in)					
			GPD515/G5			A1000		
			W	H	D	W	H	D
3-Phase 240 V Class	20P41	2A0004	5.51	11.02	6.30	5.51	11.81	5.79
	20P71	2A0006						
		2A0008						
	21P51	2A0010						
	22P21	2A0012			7.09			
		2A0018						6.46
	23P71	2A0021						
	25P51	2A0030	7.87	11.81	8.07			6.57
	27P51	2A0040						

NOTE:
A1000 models noted with cell shading are provided as standard with Open/IP00 Protected Chassis. Order the appropriate NEMA Type 1/IP20 end cap kit when NEMA Type 1/IP20 is required for these models.

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-AU	Outer Dimensions (in)					
			GPD515/G5			A1000		
			W	H	D	W	H	D
3-Phase 240 V Class	20111	2A0056	9.84	14.96	8.86	7.09	13.39	7.36
	20151	2A0069		15.75		8.66	15.75	7.76
	20181	2A0081	12.99	24.02	11.22			
		2A0110				10.00	21.02	10.16
	20221			26.57				
	20300	2A0138	16.83	38.78	13.78	10.98	24.17	
		2A0169				12.95	28.74	11.14
	20370	2A0211						
	20550	2A0250	18.90	43.70		17.95	37.80	12.99
	20750	2A0312	22.83	50.79	15.75			
	N/A	2A0360	N/A	N/A	N/A	19.84	45.98	13.78

Table 19 480V NEMA Type1/IP20

NOTE:
A1000 models noted with cell shading are provided as standard with Open/IP00 Protected Chassis. Order the appropriate NEMA Type 1/IP20 end cap kit when NEMA Type 1/IP20 is required for these models.

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-AU	Outer Dimensions (in)					
			GPD15/G5			A1000		
			W	H	D	W	H	D
3-Phase 480 V Class	40P41	4A0002	5.51	11.02	6.30	5.51	11.81	5.79
	40P71	4A0004						
	41P51	4A0005						
		4A0007						6.46
	43P71	4A0009						
		4A0011						
	44P01	4A0018						6.57
	45P51	4A0023	7.87	11.81	8.07			
	47P51	4A0031				7.09	13.39	
	40111	4A0038	9.84	14.96	8.86			7.36
	40151	4A0044				8.66	15.75	7.76
	40181	4A0058	12.99	24.02	11.22	10	18.31	10.16
	40221	4A0072				10.98	20.28	
	40301	4A0088		30.91		12.95	24.80	
	40371	4A0103						
	40451	4A0139		33.46			28.74	11.14
	40551	4A0165		32.28	13.78			

NOTE:
A1000 models noted with cell shading are provided as standard with Open/IP00 Protected Chassis. Order the appropriate NEMA Type 1/IP20 end cap kit when NEMA Type 1/IP20 is required for these models.

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-AU	Outer Dimensions (in)					
			GPD15/G5			A1000		
			W	H	D	W	H	D
(continued) 3-Phase 480 V Class	40750	4A0208	17.91	32.28	13.78	17.95	37.80	12.99
	41100			36.42	14.76			
		4A0250				19.84	45.98	13.78
	41600	4A0296	22.64	36.42	15.75			
		4A0362						
	41850	4A0414	37.40	57.09	17.13	—	—	—
	42200	4A0515						
	43000	4A0675	37.80	62.99	17.91	—	—	—
	—	4A0930	—	—	—	—	—	—
	—	4A1200	—	—	—	—	—	—

Table 20 600V NEMA Type1/IP20

NOTE:
Models noted with cell shading are provided as standard with Open/IP00 Protected Chassis. Order the appropriate NEMA Type 1/IP20 end cap kit when NEMA 1/IP20 is required for these models.

Voltage Class	GPD515/G5 Model CIMR-G5U	A1000 Model CIMR-AU	Outer Dimensions (in)					
			GPD515/G5			A1000		
			W	H	D	W	H	D
3-Phase 240 V Class	51P51	5A0003	5.51	11.02	7.08	5.51	11.81	5.79
		5A0004						
	52P21	5A0006						6.46
	53P71	5A0009	7.87	11.81	8.07			
	55P51	5A0011		11.81				6.57
	57P51	5A0017		11.81		7.09	13.39	7.36
	50111	5A0022	9.84	14.96	8.85			
	50151	5A0027				8.66	15.75	7.76
	50181	5A0032	15.75	29.53	11.22			
	50221	5A0041				10.98	20.28	10.16
	50301	5A0052	22.64	33.47	11.81			
	50371	5A0062				12.95	28.74	11.14
	50451	5A0077						
	50551	5A0099		41.34	12.8			
	50751	5A0125		41.97		17.95	37.80	12.99
	50900	5A0145		49.21	12.99			
	51100	5A0192		62.99	13.98	19.84	45.98	13.78
	51600	5A0242						

■ Braking Resistor Installation Attachment

The G5 allows a braking resistor to be installed directly to the unit on the backside (heatsink). The A1000 requires a special attachment for installation. The table below lists the attachment sizes according to the drive capacity.

The attachment will increase the overall size of the drive when installing a braking resistor to certain A1000 models.

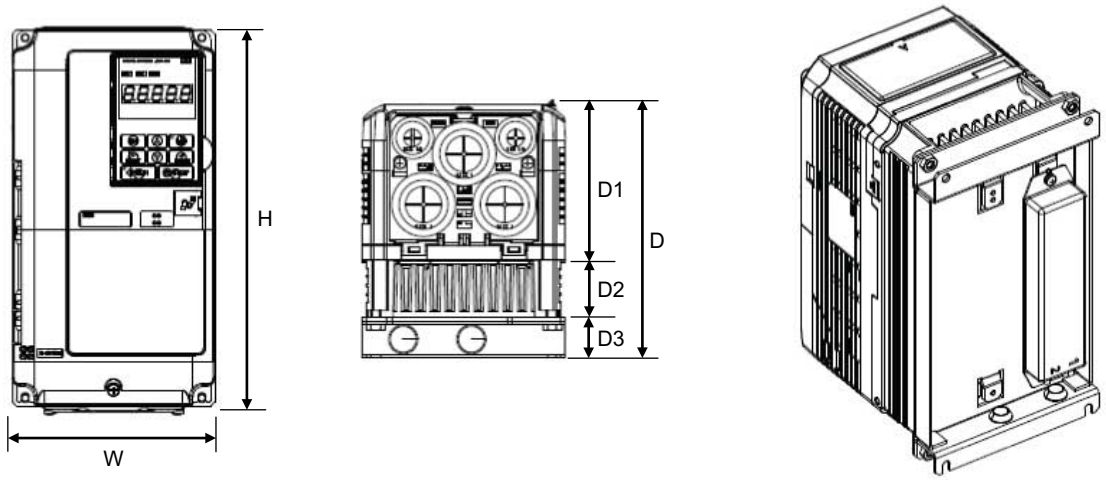


Figure 20 Installing a Braking Resistor on A1000 (240 V class 0.4 kW, or 0.5 HP)

Table 21 A1000 Dimensions after Installing Resistor Attachment

Voltage Class	Capacity (HP)	Dimensions (in)											D1, D2, D3 Differences (in)	Attachment for Braking Resistor Model (Parts Code)
		G5					A1000							
		W	H	D1	D2	D	W	H	D1	D2	D3	D		
3-Phase 200 V Class	0.75	5.51	11.02	4.76	1.54	6.30	5.51	10.23	4.29	1.5	1.10	6.89	+0.59	EZZ020805A (100-048-123)
	1												+0.59	
	2												+0.59	
	3				2.32	7.08							+0.19	
	5									2.17		7.56	+0.48	
3-Phase 400 V Class	0.75	5.51	11.02	4.76	1.54	6.30	5.51	10.23	4.29	1.5	1.10	6.89	+0.59	
	1												+0.59	
	2												+0.59	
	3				2.32	7.08				2.17		7.56	+0.19	
	5												+0.48	
3-Phase 600 V Class	0.75	5.51	11.02	4.76	1.54	6.30	5.51	10.23	4.29	1.5	1.10	6.89	+0.59	Contact Factory
	1												+0.59	
	2				2.32	7.08							+0.59	
	3									2.17		7.56	+0.19	
	5												+0.48	

Note: Use of the braking resistor attachment may void certain vibration and shock requirements, particularly when installed in combination with other attachments for retrofitting A1000 to the GPD515/G5 installation. For areas where vibration is a major concern, install the braking resistor directly to a seperate panel board instead of using the resistor attachment.

Table 22 Heat Loss Data

Heat Loss Data (A1000 and GPD515/G5)										
G5 Model CIMR-G5U	A1000 Model CIMR-AU	GPD515/G5 Watts			A1000 Watts			A1000 heat loss Comparison (% of GPD515/G5)		Total
		Internal	External	Total	Internal	External	Total	Internal	External	
20P4	2A0004	50	15	65	44	14.8	58.8	88.00%	98.67%	90.46%
20P7	2A0006	65	25	90	48	24	72	73.85%	96.00%	80.00%
21P5	2A0008 2A0010	80	40	120	49 52	35 43	84 95	61.25% 65.00%	87.50% 107.50%	70.00% 79.17%
22P2	2A0012 2A0018	60	80	140	58 60	64 77	122 137	96.67% 100.00%	80.00% 96.25%	87.14% 97.86%
23P7	2A0021	80	135	215	67	101	168	83.75%	74.81%	78.14%
25P5	2A0030	90	210	300	92	194	286	102.22%	92.38%	95.33%
27P5	2A0040	110	235	345	105	214	319	95.45%	91.06%	92.46%
2011	2A0056	160	425	585	130	280	410	81.25%	65.88%	70.09%
2015	2A0069	200	525	725	163	395	558	81.50%	75.24%	76.97%
2018	2A0081	230	655	885	221	460	681	96.09%	70.23%	76.95%
2022	2A0110	280	830	1110	211	510	721	75.36%	61.45%	64.95%
2030	2A0138 2A0169	440	930	1370	250 306	662 816	912 1122	56.82% 69.55%	71.18% 87.74%	66.57% 87.90%
2037	2A0211	620	1110	1730	378	976	1354	60.97%	87.93%	78.27%
2055	2A0250	890	1740	2630	466	1514	1980	52.36%	87.01%	75.29%
2075	2A0312	1160	2050	3210	588	1936	2524	50.69%	94.44%	78.63%
—	2A0360	—	—	—	783	2564	3347	—	—	—
—	2A0415	—	—	—	954	2564	3518	—	—	—
40P4	4A0002	50	10	60	45	15.9	60.9	90.00%	159.00%	101.50%
40P7	4A0004	65	20	85	46	25	71	70.77%	125.00%	83.53%
41P5	4A0005 4A0007	80	30	110	49 53	37 48	86 101	61.25% 66.25%	123.33% 160.00%	78.18% 91.82%
43P7	4A0009 4A0011	65	80	145	55 61	53 69	108 130	84.62% 93.85%	66.25% 86.25%	74.48% 89.66%
44P0	4A0018	80	120	200	86	135	221	107.50%	112.50%	110.50%
45P5	4A0023	85	135	220	97	150	247	114.12%	111.11%	112.27%
47P5	4A0031	120	240	360	115	208	323	95.83%	86.67%	89.72%
4011	4A0038	150	305	455	141	263	404	94.00%	86.23%	88.79%
4015	4A0044	180	390	570	179	330	509	99.44%	84.62%	89.30%
4018	4A0058	195	465	660	170	349	519	87.18%	75.05%	78.64%
4022	4A0072	260	620	880	217	484	701	83.46%	78.06%	79.66%
4030	4A0088	315	705	1020	254	563	817	80.63%	79.86%	80.10%
4037	4A0103	370	875	1245	299	723	1022	80.81%	82.63%	82.09%
4045	4A0139	415	970	1385	416	908	1324	100.24%	93.61%	95.60%
4055	4A0165	710	1110	1820	580	1340	1920	81.69%	120.72%	105.49%
4075	4A0208	890	1430	2320	541	1771	2312	60.79%	123.85%	99.66%
4110	4A0250	1160	1870	3030	715	2360	3075	—	—	—
4160	4A0296 4A0362	1520	2670	4190	787 985	2391 3075	3178 4060	51.78% 64.80%	89.55% 115.17%	75.85% 96.89%
4185	4A0414	1510	3400	4910	1164	3578	4742	77.09%	105.24%	96.58%
4220	4A0515	2110	4740	6850	1386	3972	5358	65.59%	83.80%	78.22%
4300	4A0675	2910	6820	9730	1685	4191	5876	57.90%	61.45%	60.39%
—	4A0930	—	—	—	2455	6912	9367	—	—	—
—	4A1200	—	—	—	3155	7626	10781	—	—	—
51P5	5A0003 5A0004	55	35	90	23.3 33.6	21.5 27.5	44.8 61.1	42.36% 61.09%	61.43% 78.57%	49.78% 67.89%
52P2	5A0006	60	45	105	43.7	28.1	71.8	72.83%	62.44%	68.38%
53P7	5A0009	75	65	140	68.9	43.4	112.3	91.87%	66.77%	80.21%
55P5	5A0011	105	100	205	88	56.1	144.1	83.81%	56.10%	70.29%
57P5	5A0017	90	130	220	146.7	96.6	243.3	163.00%	74.31%	110.59%
5011	5A0022	150	180	330	178.3	99.4	277.7	118.87%	55.22%	84.15%
5015	5A0027	210	250	460	227.2	132.1	359.3	108.19%	52.84%	78.11%
5018	5A0032	230	310	540	279.9	141.6	421.5	121.70%	45.68%	78.06%
5022	5A0041	340	380	720	—	—	0	0.00%	0.00%	0.00%
5030	5A0052	390	430	820	—	—	0	0.00%	0.00%	0.00%

Heat Loss Data (A1000 and GPD515/G5)										
G5 Model CIMR-G5U	A1000 Model CIMR-AU	GPD515/G5 Watts			A1000 Watts			A1000 heat loss Comparison (% of GPD515/G5)		Total
		Internal	External	Total	Internal	External	Total	Internal	External	
5037	5A0062	540	680	1220	—	—	0	0.00%	0.00%	0.00%
5045	5A0077	750	900	1650	—	—	0	0.00%	0.00%	0.00%
5055	5A0099	750	1000	1750	—	—	0	0.00%	0.00%	0.00%
5075	5A0125	1150	1100	2250	—	—	0	0.00%	0.00%	0.00%
5090	5A0145	1200	1150	2350	—	—	0	0.00%	0.00%	0.00%
5110	5A0192	1800	1400	3200	—	—	0	0.00%	0.00%	0.00%
5160	5A0242	1830	1870	3700	—	—	0	0.00%	0.00%	0.00%

◆ Minimum Connectable Resistance

GPD515/G5 Drive Model CIMR-G5U	Minimum Connectable Resistance (Ω)
20P1	—
20P2	—
20P4	48
20P7	48
21P5	16
22P2	16
23P7	16
25P5	9.6
27P5	9.6
2011	N/A
2015	N/A
2018	N/A
40P2	–
40P4	96
40P7	96
41P5	64
42P2	64
43P7	32
44P0	32
45P5	32
47P5	32
4011	20
4015	20
4018	N/A
51P5	150
52P5	150
53P7	130
55P5	90
57P5	65
5011	44
5015	32
5018	26
5022	26
—	—
—	—
—	—

A1000 Drive Model CIMR-AU	Minimum Connectable Resistance (Ω)
2A0004	48
2A0006	48
2A0008	48
2A0010	48
2A0012	16
2A0018	16
2A0021	16
2A0030	16
2A0040	9.6
2A0056	9.6
2A0069	9.6
2A0081	9.6
2A0110	6.4
2A0138	6.4
4A0002	96
4A0004	96
4A0005	64
4A0007	64
4A0009	32
4A0011	32
4A0018	32
4A0023	32
4A0031	20
4A0038	20
4A0044	19.2
4A0058	19.2
4A0072	19.2
5A0003	150
5A0004	150
5A0006	150
5A0009	130
5A0011	90
5A0017	65
5A0022	44
5A0027	32
5A0032	26

10 Appendix 2 Parameter Cross Reference

◆ Parameter Compatibility Table

1. This document lists the information needed to upgrade from G5 to a new A1000 drive. The A1000 drive must be set for Heavy Duty. First, set A1000 parameter C6-01 to 0.
2. Check all G5 parameters that have been changed from their default settings by using the Modified Constants Menu.
3. Set the same control mode used for G5 to A1000.
4. Set parameters as described in this section.

Note: Default Values in the table below are listed for A1000 240 V Class 0.4 kW Drive Using Open Loop Vector Control.

Table 23 Parameter Cross Reference

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Environment Settings	Language Selection for digital operator display	A1-00	0	A1-00	0	A1-00	A1-00
						0: English	0: English
						1: Japanese	1: Japanese
						2: German	2: German
						3: French	3: French
						4: Italian	4: Italian
						5: Spanish	5: Spanish
						6: Portuguese	6: Portuguese
						—	7: Chinese
	Constant Access Level	A1-01	2	A1-01	2	A1-01	A1-01
						0: Monitor Custom	0: Operation only (monitors only)
						1: User Selection Parameter	1: User Parameters *
						2: QUICK-START (Q)	2: All parameters
						3: BASIC (B)	
						4: ADVANCED (A)	
						* A2-01 through A2-32 Setting	
	User setting constant	A1-02	2	A1-02	2	A1-02	A1-02
						0: V/f	0: V/f Control
						1: V/f w/PG Control	1: V/f w/PG Control
						2: Open Loop Vector	2: Open Loop Vector
						3: Flux Loop Vector	3: Closed Loop Vector
						—	5: Open Loop Vector for PM
						—	6: Advanced Open Loop Vector Control for PM
						—	7: Closed Loop Vector Control for PM
	Initialize	A1-03	0	A1-03	0	A1-03	A1-03
						0: No initialization	0: No initialization
						1110: User Setting	1110: User initialize
						2220: 2-wire sequence	2220: 2-wire sequence
						3330: 3-wire sequence	3330: 3-wire sequence
						—	5550: Reset OPE04
	Enter Password	A1-04	0	A1-04	0000	—	
	Password 2	A1-05	0	A1-05	0000	—	
	User setting constant	A2-01 to A2-32	—	A2-01 to A2-32	—	If setting A1-01 to 1, refer to the manual and set parameters A2-01 to A2-32.	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Operation Mode Selection	Reference Selection	b1-01	1	b1-01	1	b1-01 0: Operator 1: Control circuit terminal (analog input) 2: Serial Communication 3: Option PCB 4: EWS	b1-01 0: Operator 1: Control circuit terminal (analog input) 2: MEMOBUS comm. 3: Option PCB 4: Pulse train input
	Operation Method Selection	b1-02	1	b1-02	1	b1-02 0: Operator 1: Control circuit terminal 2: Serial Communication 3: Option PCB 4: EWS	b1-02 0: Operator 1: Control circuit terminal 2: MEMOBUS comm. 3: Option PCB Not available
	Stopping Method Selection	b1-03	0	b1-03	0	b1-03 0: Ramp to stop 1: Coast to stop 2: DC Injection Braking 3: Coast to stop with timer	b1-03 0: Ramp to stop 1: Coast to stop 2: DC Injection Braking 3: Coast to stop with timer
	Prohibition of Reverse Operation	b1-04	0	b1-04	0	b1-04 0: Reverse possible 1: Reverse prohibited	b1-04 0: Reverse possible 1: Reverse prohibited
	Operation Selection for setting of E1-09 or Less	b1-05	0	b1-05	0	b1-05 0: Run at frequency reference 1: Shut off drive output 2: Operate by E1-09 3: Zero speed	b1-05 0: Run at frequency reference 1: Shut off drive output 2: Operate by E1-09 3: Zero speed
	Read sequence input twice	b1-06	1	b1-06	1	b1-06 0: 2 ms - 2 scans 1: 5 ms - 2 scans	b1-06 0: 1 ms - 1 scan 1: 1 ms - 2 scans
	Operation Selection After Switching to Remote Mode	b1-07	0	b1-07	0	b1-07 0: Cycle Run command 1: Accept external Run cmd	b1-07 0: Cycle Run command 1: Accept external Run cmd
	Run Command Selection in PRG Mode	b1-08	0	b1-08	0	b1-08 0: Disabled. 1: Run cmd always accepted —	b1-08 0: Disabled. 1: Run cmd always accepted 2: Cannot enter Program Mode
	Run Command at Power Up	—	—	b1-17	0	0: Prohibited 1: Allowed Change b1-17 to 1.	
DC Injection Braking	Zero speed level (DC injection braking starting frequency)	b2-01	0.5 Hz	b2-01	0.5 Hz	—	
	DC Injection Braking current	b2-02	50 %	b2-02	50 %	—	
	DC Injection Braking Time at Start	b2-03	0.00 s	b2-03	0.00 s	—	
	DC Injection Braking Time at Stop	b2-04	0.00 s	b2-04	0.50 s*	*Determined by the control mode selected.	
	Magnetic Flux Compensation volume	b2-08	0 %	b2-08	0 %	—	
Speed Search	Speed Search Selection at start	b3-01	0*	b3-01	0*	b3-01 0: Disabled 1: Enabled *Default value changes according to the control mode.	b3-01 0: Disabled 1: Enabled
	Speed Search Operating Current	b3-02	100 %*	b3-02	120 %*	*Default value changes according to the control mode.	
Speed Search	Speed Search Deceleration Time	b3-03	2.0 s	b3-03	2.0 s	—	
Timers	Timer Function On-Delay Time	b4-01	0.0 s	b4-01	0.0 s	—	
	Timer Function Off-Delay Time	b4-02	0.0 s	b4-02	0.0 s	—	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
PDI Control	PID Control Method Selection	b5-01	0	b5-01	0	b5-01 0: Disabled 1: D = control for bias 2: D control of feedback 3: D control of Freq. Ref. + PID output bias 4: D control of Freq. Ref. + PID output	b5-01 0: Disabled 1: D control for bias 2: D control of feedback 3: D control of Freq. Ref. + PID output bias 4: D control of Freq. Ref. + PID output
	Proportional Gain Setting (P)	b5-02	1.00	b5-02	1.00	–	
	Integral Time Setting (I)	b5-03	1.0 s	b5-03	1.0 s	–	
	Integral Limit Setting	b5-04	100.0 %	b5-04	100.0 %	–	
	Derivative Time (D)	b5-05	0.00 s	b5-05	0.00 s	–	
	PID Output Limit	b5-06	100.0 %	b5-06	100.0 %	–	
	PID Offset adjustment	b5-07	0.0 %	b5-07	0.0 %	–	
	PID Primary Delay Time	b5-08	0.00 s	b5-08	0.00 s	–	
	PID Output Characteristics Selection	b5-09	0	b5-09	0	b5-09 0: FWD 1: REV	b5-09 0: FWD 1: REV
	PID Output Gain Setting	b5-10	1.0	b5-10	1.00	Minimum setting units vary.	
	PID Output Reverse Selection	b5-11	0	b5-11	0	b5-11 0: Negative PID output triggers zero limit 1: Rotation direction reverses with negative PID output.	b5-11 0: Negative PID output triggers zero limit 1: Rotation direction reverses with negative PID output.
	Selection PID Feedback Command Loss Detection	b5-12	0	b5-12	0	b5-12 0: No Detection 1: Continue operation 2: Fault – – –	b5-12 0: No Detection 1: Continue operation 2: Fault 3: Multi-function output only detected during PID control cancel input only. 4: An alarm is triggered and the drive continues running. Detected only when PID control is canceled. 5: Fault is triggered and output is shut off. Detected only when PID control is canceled.
	PID Feedback Command Loss Detection Level	b5-13	0 %	b5-13	0 %	–	
	PID Feedback Command Loss Detection Time	b5-14	1.0 s	b5-14	1.0 s	–	
Dwell Function	Dwell Reference at Start	b6-01	0.0 Hz	b6-01	0.0 Hz	–	
	Dwell Time at Start	b6-02	0.0 s	b6-02	0.0 s	–	
	Dwell Frequency at Stop	b6-03	0.0 Hz	b6-03	0.0 Hz	–	
	Dwell Time at Stop	b6-04	0.0 s	b6-04	0.0 s	–	
Droop Control	Droop Control Gain	b7-01	0.0 %	b7-01	0.0 %	–	
	Droop Control Delay Time	b7-02	0.05 s	b7-02	0.05 s	–	
Energy Saving Control	Energy Saving Gain	b8-01	80 %	b8-01	0	b8-01 Enabled via multi-function input (H1-XX=63)	b8-01 0: Disabled – Not available in A1000 1: Enabled – Divide the setting of b8-01 in G5 by 100
				b8-02	0.7		
	Energy Saving Frequency	b8-02	0.0 Hz	—	—	This parameter is not available in A1000, and therefore does not need to be set.	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Zero Servo	Zero Servo Gain	b9-01	5	b9-01	5	–	
	Zero Servo Completion Width	b9-02	10	b9-02	10	–	
Accel/Decel Time	Acceleration Time 1	C1-01	10.0 s	C1-01	10.0 s	–	
	Deceleration Time 1	C1-02	10.0 s	C1-02	10.0 s	–	
	Acceleration Time 2	C1-03	10.0 s	C1-03	10.0 s	–	
	Deceleration Time 2	C1-04	10.0 s	C1-04	10.0 s	–	
	Acceleration Time 3	C1-05	10.0 s	C1-05	10.0 s	–	
	Deceleration Time 3	C1-06	10.0 s	C1-06	10.0 s	–	
	Acceleration Time 4	C1-07	10.0 s	C1-07	10.0 s	–	
	Deceleration Time 4	C1-08	10.0 s	C1-08	10.0 s	–	
	Emergency Stop Time	C1-09	10.0 s	C1-09	10.0 s	–	
	Accel/Decel Time Setting Unit	C1-10	1	C1-10	1	C1-10 0: 0.01 sec units 1: 0.1 sec units	C1-10 0: 0.01 sec units 1: 0.1 sec units
	Accel/Decel Time Switch Frequency	C1-11	0.0 Hz	C1-11	0.0 Hz	–	
S-Curve Characteristics	S-Curve Characteristic at Accel Start	C2-01	0.20 s	C2-01	0.20 s	–	
	S-Curve Characteristic at Accel End	C2-02	0.20 s	C2-02	0.20 s	–	
	S-Curve Characteristic at Decel Start	C2-03	0.20 s	C2-03	0.20 s	–	
	S-Curve Characteristic at Decel End	C2-04	0.00 s	C2-04	0.00 s	–	
Slip Compensation	Slip Compensation Gain	C3-01	1.0*	C3-01	1.0*	*Determined by the control mode selected.	
	Slip Compensation Primary Delay Time	C3-02	200 ms*	C3-02	200 ms*	*Determined by the control mode selected.	
	Slip Compensation Limit	C3-03	200 %	C3-03	200 %	–	
	Slip Compensation Selection during Regeneration	C3-04	0	C3-04	0	C3-04 0: Disabled 1: Enabled	C3-04 0: Disabled 1: Enabled
	Flux calculation method	C3-05	0	-	0	This parameter is not available in A1000, and therefore does not need to be set.	
	Output Voltage Limited Operation Selection	C3-06	0	C3-05	0	C3-06 0: Disabled 1: Enabled	C3-05 0: Disabled 1: Enabled
Torque Compensation	Torque Compensation Gain	C4-01	1.00	C4-01	1.00	–	
	Torque Compensation Primary Delay Time	C4-02	20 ms*	C4-02	20 ms*	*Determined by the control mode selected.	
	Torque Compensation at Forward Start	C4-03	0.0 %	C4-03	0.0 %	–	
	Torque Compensation at Reverse Start	C4-04	0.0 %	C4-04	0.0 %	–	
	Torque Compensation Time Constant	C4-05	10 ms	C4-05	10 ms	–	
Speed Control (ASR)	ASR Proportional Gain 1	C5-01	20.00*	C5-01	20.00*	*Determined by the control mode selected. Default shown here is for when using Closed Loop Vector Control.	
	ASR Integral Time 1	C5-02	0.500 sec*	C5-02	0.500 sec*		
	ASR Proportional Gain 2	C5-03	20.00*	C5-03	20.00*		
	ASR Integral Time 2	C5-04	0.500 sec*	C5-04	0.500 s*		
	ASR Limit	C5-05	5.0 %	C5-05	5.0 %	–	
	ASR Primary Delay Time Constant	C5-06	0.004 sec	C5-06	0.004 sec	* Default shown here is for when using Closed Loop Vector.	
	ASR Gain Switching Frequency	C5-07	0.0 Hz	C5-07	0.0 Hz		
	ASR Integral Limit	C5-08	400 %	C5-08	400 %		

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)		
		No.	Default	No.	Default	G5	A1000	
Carrier Frequency	Carrier Frequency Upper Limit	C6-01	10.0 kHz	C6-02	*	* Default setting is determined by the control mode and by drive capacity. Change the setting for C6-02 to F.		
				C6-03	2.0 kHz	–		
	Carrier Frequency Lower Limit	C6-02	10.0 kHz	C6-02	*	* Default setting is determined by the control mode and by drive capacity. Change the setting for C6-02 = F.		
				C6-04	2.0 kHz	–		
	Carrier Frequency Proportional Gain	C6-03	00	C6-05	0	–		
Hunting Prevention Function	Hunting prevention function selection*	C7-01	1	N1-01	1	* These parameters are only displayed when using V/f Control of with PG.		
						C7-01	n1-01	
						0: Disabled	0: Disabled	
						1: Enabled	1: Enabled	
	Hunting Prevention Gain *	C7-02	1.00	n1-02	1.00	* These parameter are only displayed when using V/f Control of V/f Control with PG.		
Factory Tuning Parameters	Carrier frequency selection during autotuning	C8-30	2	C6-09	0	C8-30	C6-09	
						0: 2 kHz	1: Setting value of C6-03*	
						1: Setting value of C6-01	1: Setting value of C6-03*	
						2: 5 kHz	0: 5 kHz	
						*Auto-Tuning set C6-09 tp va;ie pf C6-03.		
Frequency Reference	Frequency Reference 1	d1-01	0.00 Hz	d1-01	0.00 Hz	–		
	Frequency Reference 2	d1-02	0.00 Hz	d1-02	0.00 Hz	–		
	Frequency Reference 3	d1-03	0.00 Hz	d1-03	0.00 Hz	–		
	Frequency Reference 4	d1-04	0.00 Hz	d1-04	0.00 Hz	–		
	Frequency Reference 5	d1-05	0.00 Hz	d1-05	0.00 Hz	–		
	Frequency Reference 6	d1-06	0.00 Hz	d1-06	0.00 Hz	–		
	Frequency Reference 7	d1-07	0.00 Hz	d1-07	0.00 Hz	–		
	Frequency Reference 8	d1-08	0.00 Hz	d1-08	0.00 Hz	–		
	Jog Frequency Reference 9	d1-09	6.00 Hz	d1-09	0.00 Hz	–		
Frequency Limits	Frequency Reference Upper Limit Value	d2-01	100.0 %	d2-01	100.0 %	–		
	Frequency Reference Lower Limit Value	d2-02	0.0 %	d2-02	0.0 %	–		
Setting Prohibited Frequency	Jump Frequency 1	d3-01	0.0 Hz	d3-01	0.0 Hz	–		
	Jump Frequency 2	d3-02	0.0 Hz	d3-02	0.0 Hz	–		
	Jump Frequency 3	d3-03	0.0 Hz	d3-03	0.0 Hz	–		
	Jump Frequency Width	d3-04	1.0 Hz	d3-04	1.0 Hz	–		
Frequency Reference Hold	Frequency Reference Hold Function Selection	d4-01	0	d4-01	0	d4-01	d4-01	
						0: Disabled	0: Disabled	
						1: Enabled	1: Enabled	
	+/- Speed limit	d4-02	10 %	d7-01	0.0 %	d4-02	d7-01	d7-02
				d7-02	0.0 %	Set value	Set value	No need to set
							No need to set	Negative
Torque Control	Torque Control Selection	d5-01	0	d5-01	0	d5-01	d5-01	
						0: Speed Control	0: Speed Control	
						1: Torque Control	1: Torque Control	
	Frequency reference hold function selection	d5-02	0 ms	d5-02	0 ms	–		
	Speed Limit Selection	d5-03	1	d5-03	1	d5-03	d5-03	
						1: Limited by b1-01	1: Limited by b1-01	
						2: Limited by d5-04	2: Limited by d5-04	
	Speed Limit	d5-04	0 %	d5-04	0 %	–		
	Speed Limit Bias	d5-05	10 %	d5-05	10 %	–		
	Speed/Torque Control Switch Timer	d5-06	0 ms	d5-06	0 ms	–		

<table>
<tr><th colspan="2" rowspan="2">Parameter Name</th><th colspan="2">G5</th><th colspan="2">A1000</th><th colspan="3">Comments (Gray shading indicates default settings)</th></tr>
<tr><th>No.</th><th>Default</th><th>No.</th><th>Default</th><th colspan="2">G5</th><th>A1000</th></tr>
<tr><td rowspan="9">V/f Characteristics</td><td>Input Voltage Setting</td><td>E1-01</td><td>230 V*</td><td>E1-01</td><td>230 V*</td><td colspan="3">*Double this value for 400 V class drives.Multiply by three for 600 V class drives.</td></tr>
<tr><td rowspan="4">Motor selection</td><td rowspan="4">E1-02</td><td rowspan="4">0</td><td rowspan="8">L1-01</td><td rowspan="8">1*</td><td>E1-02</td><td>L1-01</td><td>L1-01</td></tr>
<tr><td>–</td><td>0: Disabled</td><td>0: Disabled</td></tr>
<tr><td>0: General-purpose motor protection</td><td rowspan="3">1: Enabled</td><td>1: General-purpose motor protection</td></tr>
<tr><td>1: Drive-dedicated motor protection</td><td>2: Drive-dedicated motor protection</td></tr>
<tr><td rowspan="4">Motor Protection function selection</td><td rowspan="4">L1-01</td><td rowspan="4">1</td><td>2: Vector motor protection</td><td>3: Vector motor protection</td></tr>
<tr><td>–</td><td>–</td><td>4: PM motor protection (derated torque)</td></tr>
<tr><td>–</td><td>–</td><td>5: PM motor protection (constant torque)</td></tr>
<tr><td>–</td><td>–</td><td>6: General Purpose motor (50 Hz)</td></tr>
<tr><td colspan="6">* Determined by the control mode selected</td></tr>
</table>

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
V/f Characteristic	V/f Pattern Selection	E1-03	F	E1-03	F	E1-03 0: 50 Hz spec. (constant torque characteristics 1) 1: 60 Hz spec. (constant torque characteristics 2) 2: 60 Hz spec. (constant torque characteristics 3), voltage saturation at 50 Hz 3: 72 Hz spec. (constant torque characteristics 4), voltage saturation at 60 Hz 4: 50 Hz spec. (derated torque 1) 5: 50 Hz spec. (derated torque 2) 6: 60 Hz spec. (derated torque 3) 7: 60 Hz spec. (derated torque 4) 8: 50 Hz spec. (high starting torque 1) 9: 50 Hz spec. (high starting torque 2) A: 60 Hz spec. (high starting torque 3) B: 60 Hz spec. (high starting torque 4) C: 90 Hz spec. , Voltage Saturation at 60 Hz D: 120 Hz spec. , Voltage saturation at 60 Hz E: 180 Hz spec. , Voltage saturation at 60 Hz F: User-Set V/f pattern	E1-03 0: 50 Hz spec. (constant torque characteristics 1) 1: 60 Hz spec. (constant torque characteristics 2) 2: 60 Hz spec. (constant torque characteristics 3), voltage saturation at 50 Hz 3: 72 Hz spec. (constant torque characteristics 4), voltage saturation at 60 Hz 4: 50 Hz spec. (derated torque 1) 5: 50 Hz spec. (derated torque 2) 6: 60 Hz spec. (derated torque 3) 7: 60 Hz spec. (derated torque 4) 8: 50 Hz spec. (high starting torque 1) 9: 50 Hz spec. (high starting torque 2) A: 60 Hz spec. (high starting torque 3) B: 60 Hz spec. (high starting torque 4) C: 90 Hz spec. , Voltage Saturation at 60 Hz D: 120 Hz spec. , Voltage saturation at 60 Hz E: 180 Hz spec. , Voltage saturation at 60 Hz F: User-Set V/f pattern
	Max Output Frequency	E1-04	60.0 Hz*	E1-04	60.0 Hz*	*Depends on the control mode and the V/F pattern selected.	
	Max Voltage	E1-05	230.0 V*	E1-05	*	* Depends on the control mode and the V/F pattern selected . Double values for 400 V class drives. Multiply by 3 for 600 V class.	
	Base Frequency	E1-06	60.0 Hz*	E1-06	*	*Depends on the control mode and the V/f pattern selected.	
	Mid. Output Frequency	E1-07	3.0 Hz*	E1-07	3.0 Hz*	*Depends on the control mode and the V/f pattern selected.	
	Mid. Output Frequency Voltage	E1-08	12.6 V*	E1-08	*	*Depends on the control mode and the V/f pattern selected. Double values for 400 V class drives. Multiply by 3 for 600 V class.	
	Minimum Output Frequency	E1-09	0.5 Hz*	E1-09	*	*Depends on the control mode and the V/f pattern selected.	
	Minimum Output Frequency Voltage	E1-10	2.3 V*	E1-10	2.3 V*	*Depends on the control mode and the V/f pattern selected. Double values for 400 V class drives. Multiply by 3 for 600 V class.	
	Mid. Output Frequency 2	E1-11	0.0 Hz	E1-11	0.0 Hz	–	
	Mid. Output Frequency Voltage 2	E1-12	0.0 V	E1-12	0.0 V	–	
	Base Voltage	E1-13	0.0 V	E1-13	0.0 V	–	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Motor Parameters	Motor Rated Current	E2-01	1.90A*	E2-01	*	* Depends on drive capacity.	
	Motor Rated Slip	E2-02	2.90 Hz*	E2-02	*	* Depends on drive capacity.	
	Motor de-coupled load current	E2-03	1.20A*	E2-03	*	* Depends on drive capacity.	
	Number of Motor Poles	E2-04	4-pole	E2-04	4-pole	—	
	Motor Line-to-Line Resistance	E2-05	9.842*	E2-05	*	* Depends on drive capacity.	
	Motor Leakage Inductance	E2-06	18.2	E2-06	*	* Depends on drive capacity.	
	Motor iron core saturation Co-efficient 1	E2-07	0.50	E2-07	0.50	—	
	Motor iron core saturation Co-efficient 2	E2-08	0.75	E2-08	0.75	—	
	Motor Mechanical Loss	E2-09	0.0 %	E2-09	0.0 %	—	
	Motor Iron Loss for Torque Compensation	E2-10	14 W*	E2-10	*	* Depends on drive capacity.	
Motor 2 Control Mode	Motor 2 Control Method Selection	E3-01	2	E3-01	0	E3-01	E3-01
						0: V/f	0: V/f
						1: V/f w/PG	1: V/f w/PG
						2: Open Loop Vector	2: Open Loop Vector
						3: Flux Vector Control	3: Closed Loop Vector
Motor 2 V/f Characteristics	Motor 2 Max Output Frequency	E4-01	60.0 Hz	E3-04	*	*Determined by control mode selected for motor 2.	
	Motor 2 Max Voltage	E4-02	230 V*	E3-05	*	*Determined by control mode selected for motor 2. Double values for 400 V class drives. Multiply by 3 for 600 v class.	
	Motor 2 Base Frequency	E4-03	60.0 Hz	E3-06	*	*Determined by control mode selected for motor 2.	
	Motor 2 Mid. Output Frequency	E4-04	3.0 Hz*	E3-07	*	*Determined by control mode selected for motor 2.	
	Motor 2 Mid. Output Frequency Voltage	E4-05	12.6 V*	E3-08	*	*Determined by control mode selected for motor 2. Double values for 400 V class drives. Multiply by 3 for 600 V class.	
	Motor 2 Minimum Output Frequency	E4-06	0.5 Hz*	E3-09	*	*Determined by control mode selected for motor 2.	
	Motor 2 Minimum Output Voltage	E4-07	2.3 V*	E3-10	*	*Determined by control mode selected for motor 2. Double values for 400 V class drives. Multiply by 3 for 600 V class.	
Motor 2 Parameter	Motor 2 Rated Current	E5-01	1.90 A*	E4-01	*	*Depends on drive capacity.	
	Motor 2 Rated Slip	E5-02	2.90 Hz*	E4-02	*	*Depends on drive capacity.	
	Motor 2 De-coupled Load Current	E5-03	1.20 A*	E4-03	*	*Depends on drive capacity.	
	Motor 2 Poles	E5-04	4-pole	E4-04	4-pole	—	
	Motor 2 Line-to-Line Resistance	E5-05	9.84 Ω*	E4-05	*	*Depends on drive capacity.	
	Motor 2 Leakage Inductance	E5-06	18.2 %*	E4-06	*	*Depends on drive capacity	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
PG speed Control Card	PG constant	F1-01	1024	F1-01	1024	—	
	Operation Selection at PG Open Circuit (PGO)	F1-02	1	F1-02	1	F1-02	F1-02
						0: Ramp to stop	0: Ramp to stop
						1: Coast to stop	1: Coast to stop
						2: Fast Stop	2: Fast Stop
						3: Continue operation	3: Continue operation
						—	4: No Alarm Display
	Operation Selection at Overspeed (OS)	F1-03	1	F1-03	1	F1-03	F1-03
						0: Ramp to stop	0: Ramp to stop
						1: Coast to stop	1: Coast to stop
						2: Fast Stop	2: Fast Stop
						3: Continue operation	3: Continue operation
	Operation Selection at Deviation	F1-04	3	F1-04	3	F1-04	F1-04
						0: Ramp to stop	0: Ramp to stop
						1: Coast to stop	1: Coast to stop
						2: Fast Stop	2: Fast Stop
						3: Continue operation	3: Continue operation
	PG Rotation Selection	F1-05	0	F1-05	0	F1-05	F1-05
						0: FWD = A pulse leads	0: FWD = A pulse leads
						1: FWD = B pulse leads	1: FWD = B pulse leads
	PG Division Rate (PG Pulse Monitor)	F1-06	1	F1-06	1	Enabled when using the PG-B2 option card.	
	Integral Value During Accel/Decel Enable/ Disable	F1-07	0	C5-12	0	F1-07	C5-12
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
	Overspeed Detection Level	F1-08	115 %	F1-08	115 %	—	
	Overspeed Detection Delay Time	F1-09	0.0 s	F1-09	1.0 s	–	
	Excessive Speed Deviation Detection Level	F1-10	10 %	F1-10	10 %	–	
	Excessive Speed Deviation Detection Delay Time	F1-11	0.5 s	F1-11	0.5 s	–	
	Number of PG Gear Teeth 1	F1-12	0	F1-12	0	–	
	Number of PG Gear Teeth 2	F1-13	0	F1-13	0	–	
	PG Open-Circuit Detection Time	F1-14	2.0 s	F1-14	2.0 s	–	
Analog Command Card	Bi-polar or uni-polar input selection	F2-01	0	F2-01	0	F2-01	F2-01
						0: 3CH seperate input functions	0: Separate input functions
						1: 3CH inputs added together	1: Sum of inputs for freq ref

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)		
		No.	Default	No.	Default	G5	A1000	
Digital Command Card	Digital Input Option	F3-01	0	F3-01	0	*The digital option card determines the setting DI-08: 0 (8 bit) DI-16H: Set switch S1 to determine input signal: S1 switch 1: 2 (16 bit) S1 switch S1: 1 (12 bit)		
						F3-01	F3-01	F3-03
						0: BCD 1 % units	0: BCD 1 % units	0: 8 bit
						1: BCD 0.1 % units	1: BCD 0.1 % units	1: 12 bit
						2: BCD 0.01 % units	2: BCD 0.01 % units	2: 16 bit
	Bit Selection for Digital Card Input Data	—	—	F3-03	2*	3: BCD 1 Hz units	3: BCD 1 Hz units	—
						4: BCD 0.1 Hz units	4: BCD 0.1 Hz units	—
						5: BCD 0.01 Hz units	5: BCD 0.01 Hz units	—
						6: BCD, custom	6: BCD, custom	—
						7: Binary input	7: Binary input	—
Analog Monitor Card	Channel 1 Monitor Selection	F4-01	2	F4-01	102	F4-01, F4-03, H4-01, H4-04, o1-01	F4-01, F4-03, H4-01, H4-04, o1-01	
						01: Frequency reference	101: Frequency reference	
						02: Output frequency	102: Output frequency	
						03: Output current	103: Output current	
						05: Motor speed	105: Motor speed	
						06: Output voltage reference	106: Output voltage reference	
						07: Main circuit DC voltage	107: Main circuit DC voltage	
						08: Output power	108: Output power	
						09: Torque ref (Internal)	109: Torque ref (Internal)	
						15: Freq ref, 13 voltage	113: Freq ref, A1 voltage	
						16: Freq ref, 14 voltage	114: Freq ref, A2 voltage	
						17: Freq ref, 16 voltage	115: Freq ref, A3 voltage	
						18: Secondary current (Iq)	601: Secondary current (Iq)	
						19: Motor excitation current (Id)	602: Motor excitation current (Id)	
						20: Output after soft start	116: Output after soft start	
						21: ASR input	603: ASR input	
						22: ASR output	604: ASR output	
						23: Speed bias	Setting not available in A1000	
						24: PID feedback amount	501: PID feedback amount	
						26: Output voltage ref (Vq)	605: Output voltage ref (Vq)	
						27: Output voltage ref (Vd)	606: Output voltage ref (Vd))	
						32: ACR output (q-axis)	607: ACR output (q-axis)	
						33: ACR output (d-axis)	608: ACR output (d-axis)	
						36: PID input amount	502: PID input amount	
						37: PID output amount	503: PID output amount	
						38: PID setpoint	504: PID setpoint	
	Channel 1 Gain	F4-02	1.00	F4-02	100.0 %	Setting units differ between G5 and A1000. Set A1000 by multiplying F4-02 in G5 by 100.		
	Channel 2 Monitor Selection	F4-03	3*	F4-03	103*	*See the comments column for F4-01.		
	Channel 2 Gain	F4-04	50.0	F4-04	50.0 %	Set A1000 by multiplying F4-04 in G5 by 100.		
	Channel 1 output Monitor Bias	F4-05	0.0 %	F4-05	0.0 %	—		
	Channel 2 Output Monitor Bias	F4-06	0.0 %	F4-06	0.0 %	—		

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Digital Output Card (DO-02, DO-08)	Channel 1 Output Selection	F5-01	0*	F5-01	2*	*See the Comments column for H2-01 through H2-03.	
	Channel 2 Output Selection	F5-02	1*	F5-02	4*		
	Output mode selection	F6-01	0	F5-09	0	F6-01	F5-09
						0: Separate output for 8 channels	0: Separate output for 8 terminals
						1: Binary Code Output	1: Binary Code Output
						–	2: Output according to F5-01 to 08
Pulse Monitor Card	Frequency Multiple Selection	F7-01	1	H6-07	1440 Hz	F7-01	H6-07
						0: 1F	Setting Range: 0 to 32000 Hz. To have the pulse train output and the output frequency be the same, set H6-06 = 102 and H6-07 = 0
						1: 6F	
						2: 10F	
						3: 12F	
						4: 36F	
SI-F/G	Communication Option Operation Selection	F8-01	1	–	–	A1000 does not support the SI-F/G Option Card.	
SI-K2, SI-F/G Communication Card	External fault input level from Optical option	F9-01	0	–	–	This parameter is not available in A1000, and therefore does not need to be set.	
	External fault from optical option	F9-02	0	F6-02	0	F9-03	F6-02
						0: Always detected	0: Always detected
						1: Detected during run	1: Detected during run
	Action for external fault from optical option	F9-03	1	F6-03	1	F9-03	F6-03
						0: Ramp to stop	0: Ramp to stop
						1: Coast to stop	1: Coast to stop
						2: Fast Stop	2: Fast Stop
						3: Alarm Only	3: Alarm Only
	Optical option trace sampling time	F9-04	0	–	–	This parameter is not available in A1000, and therefore does not need to be set.	
	Torque reference/ torque limit selection from transmission cards other than SI-K2	F9-05	1	F6-06	0	F9-05	F6-06
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
	Operation selection when transmission error detected for transmission cards other than SI-K2	F9-06	1	F6-01	1	F9-06	F6-01
						0: Ramp to stop	0: Ramp to stop
						1: Coast to stop	1: Coast to stop
						2: Fast Stop	2: Fast Stop
						3: Continue operation	3: Continue operation
Multi-Function Input	Multi-Function Digital Input Terminal S1 Function Selection	–	–	H1-01*	40 Use this setting	H1-01 to H1-06	H1-01 to H1-08
						0: 3-wire sequence	0: 3-wire sequence
						1: LOCAL/REMOTE selection	1: LOCAL/REMOTE selection
						2: Option/Drive selection	2: Run command source
							b1-15 / b1-16
							3: Option card / 3: Option card
						3: Multi-Step Speed Reference 1	3: Multi-Step Speed Reference 1
						4: Multi-Step Speed Reference 2	4: Multi-Step Speed Reference 2
	Multi-Function Digital Input Terminal S2 Function Selection	–	–	H1-02*	41 Use this setting	5: Multi-Step Speed Reference 3	5: Multi-Step Speed Reference 3
						6: Jog freq ref selection	6: Jog freq ref selection
						7: Accel/Decel Time Selection 1	7: Accel/decel time selection 1
						8: Baseblock command (N.O.)	8: Baseblock command (N.O.)
						9: Baseblock command (N.C.)	9: Baseblock command (N.C.)
						A: Hold Accel/decel stop	A: Hold Accel/decel stop
						B: Drive overheat alarm	B: Drive overheat alarm

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Multi-Function Input	Multi-function input 1 (terminal 3) (S3 in A1000)	H1-01	24	H1-03	24	C: Multi-func analog input selection	C: Multi-func analog input selection
						D: Speed control disabled (V/f with PG)	D: Speed control disabled (V/f with PG)
						E: Speed control integral reset	E: Speed control integral reset
						F: Not used	F: Through-mode
						10: Up comamnd	10: Up command
						11: Down command	11: Down command
						12: FWD jog	12: FWD jog
						13: REV jog	13: REV jog
	Multi-function input 2 (terminal 4) (S4 in A1000)	H1-02	14	H1-04	14	14: Fault Reset	14: Fault Reset
						15: Emergency Stop (N.O.)	15: Fast Stop (N.O.)
						16: Motor switch command	16: Motor switch command
						17: Fast Stop (N.O.)	17: Fast Stop (N.O.)
						18: Timer function input	18: Timer function input
						19: PID control cancel	19: PID control cancel
						1A: Accel/decel time selection 2	1A: Accel/decel time selection 2
						1B: Write allowed	1B: Write allowed
						1C: +Speed Command	44: Off-set frequency 1 (added)
						1D: -Speed Command	45: Off-set frequency 2 (added)
						1E: Analog freq ref sample hold	1E: Analog freq ref sample/hold
						1F: Freq ref terminal 13/14 selection	Set H1-oo=3, H3-02=0, H3-06=3, H3-10=2, then switch the terminal assigned by the H1 parameter.*
						* If just using the terminal 13/14 switch, then set the following:	
	Multi-function input 3 (terminal 5) (S5 in A1000)	H1-03	3 (0)	H1-05	3 (0)	Terminal: 13 — Terminal 13/14 Switch H1-XX=1F: OFF	Terminal: A1 — Multi-Speed Reference 1 H1-00=3: OFF
						Terminal: 14 — Terminal 13/14 Switch H1-XX=1F: ON	Terminal: A2 — Multi-Speed Reference 1 H1-00=3: ON
						20: External fault (N.O., Always detected, Ramp to stop)	20: External fault (N.O., Always detected, Ramp to stop)
						21: External fault (N.C., Always detected, Ramp to stop)	21: External fault (N.C., Always detected, Ramp to stop)
						22: External fault (N.O., Detected during run, Ramp to stop)	22: External fault (N.O., Detected during run, Ramp to stop)
						23: External fault (N.C., Detected during run, Ramp to stop)	23: External fault (N.C., Detected during run, Ramp to stop)
						24: External fault (N.O., Always detected, Coast to stop)	24: External fault (N.O., Always detected, Coast to stop)
						25: External fault (N.C., Always detected, Coast to stop)	25: External fault (N.C., Always detected, Coast to stop)
						26: External fault (N.O., Detected during run, Coast to stop)	26: External fault (N.O., Detected during run, Coast to stop)
						27: External fault (N.C., Detected during run, Coast to stop)	27: External fault (N.C., Detected during run, Coast to stop)
						28: External Fault (N.O., always detected, Fast Stop)	28: External Fault (N.O., always detected, Fast Stop)
						29: External fault (N.C., always detected, Fast Stop)	29: External fault (N.C., always detected, Fast Stop)

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Multi-Function Input	Multi-function input 4 (terminal 6) (S6 in A1000)	H1-04	4 (3)	H1-06	4 (3)	2A: External Fault (N.O., detected during run, Fast Stop)	2A: External Fault (N.O., detected during run, Fast Stop)
						2B: External fault (N.C., detected during run, Fast Stop)	2B: External fault (N.C., detected during run, Fast Stop)
						2C: External fault (N.O., always detected, alarm only)	2C: External fault (N.O., always detected, alarm only)
						2D: External fault (N.C., always detected, alarm only)	2D: External fault (N.C., always detected, alarm only)
						2E: External Fault (N.O., detected during run, alarm only)	2E: External Fault (N.O., detected during run, alarm only)
						2F: External Fault (N.C., detected during run, alarm only)	2F: External Fault (N.C., detected during run, alarm only)
						30: PID control integral reset	30: PID control integral reset
						31: PID control integral hold	31: PID control integral hold
						–	32: Multi-step speed reference 4
						–	34: PID Soft Starter cancel
						–	35: PID input Characteristics switch
						–	40: Forward run command
						–	41: Reverse run command
	Multi-function input 5 (terminal 7) (S7 in A1000)	H1-05	6 (4)	H1-07	6 (4)	–	42: Run command
						–	43: Forward/Reverse command 2
						–	46: Off-set frequency bias
						60: DC Braking command	60: DC Braking command
						61: External search command 1	61: External search command 1
						62: External search command 2	62: External search command 2
						63: Magnetic field weakening	63: Magnetic field weakening
						64: External search comamnd 3	64: External search comamnd 3
						65: KEB command (N.C.)	65: KEB command (N.C.)
						66: KEB command (N.O.)	66: KEB command (N.O.)
						–	67: Comm. test mode
						–	68: High Slip Braking
Multi-Function Input	Multi-function input 6 (terminal 8) (S8 in A1000)	H1-06	8 (6)	H1-08	8	–	6A: Drive enable
						71: Speed/Torque Control selection	71: Speed/Torque Control switch
						72: Zero Servo	72: Zero Servo
						–	75: UP 2
						–	76: DOWN 2
						77: ASR proportional gain switch	77: ASR proportional gain switch
						–	78: External torque ref, switch polarity
						–	7A: KEB command 2 (N.C.)
						–	7B: KEB command 2 (N.O.)
						–	7C: Short Braking command (N.O.)
						–	7D: Short Braking command (N.C.)
						–	7E: Detection rotational direction
						–	90 to 97: DriveWorksEZ 1 to 8
						–	9F: DriveWorksEZ disable

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Multi-Function Output	Multi-function input (terminal 9-10) (terminals M1-M2 for A1000)	H2-01	0	H2-01	0	H2-01 to H2-03	H2-01 to H2-03
						0: During Run	0: During run
						1: Zero Speed	1: Zero speed
						2: Frequency Agree 1	2: Frequency agree 1
						3: User-set Frequency agree 1	3: User-set Frequency agree 1
						4: Frequency detection 1	4: Frequency detection 1
						5: Frequency detection 2	5: Frequency detection 2 (used when L4-07=1)
						6: Drive ready	6: Drive ready
						7: DC bus undervoltage	7: DC bus undervoltage
						8: During Baseblock	8: During Baseblock (N.O.)
						9: Freq ref selection situation	9: Freq ref selection situation
						A: Run cmd situation	A: Run cmd situation
						B: Torque detection 1 (N.O.)	B: Torque detection 1 (N.O.)
						C: Frequency reference loss	C: Frequency reference loss
						D: Braking resistor overheat	D: Braking resistor overheat
						E: Fault	E: Fault
						F: Not used	F: Through-mode
						10: Alarm	10: Alarm
						11: Fault reset	11: Fault reset

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Multi-Function Relay Output	Multi Function Input (terminal 25-27) (terminal M3-M4 for A1000)	H2-02	1	H2-02	1	12: Timer function output	12: Timer function output
						13: Frequency agree 2	13: Frequency agree 2
						14: User-Set frequency agree 2	14: User-Set frequency agree 2
						15: Frequency detection 3	15: Frequency detection 3
						16: Frequency detection 4	16: Frequency detection 4
						17: Torque detection 1 (N.C.)	17: Torque detection 1 (N.C.)
						18: Torque detection 2 (N.O.)	18: Torque detection 2 (N.O.)
						19: Torque detection 2 (N.C.)	19: Torque detection 2 (N.C.)
						1A: Reverse run	1A: Reverse run
						1B: During baseblock 2 (N.C.)	1B: During baseblock 2 (N.C.)
						1C: Motor selection	1C: Motor selection
						1D: Regenerating during run	1D: Regeneration during run
						1E: Fault restart	1E: Fault restart
						1F: Motor overload alarm	1F: Motor overload alarm
						20: Drive overheat alarm	20: Drive overheat alarm
						—	22: Mechanical weakening (N.O.)
						—	2F: Maintenance timer
						30: During torque limit	30: During torque limit
						31: During speed limit	31: During speed limit
	Multi-function input (terminal 26-27) (terminal M5-M6 for A1000)	H2-03	2	H2-03	2	—	32: Speed Limit Circuit During Run
						33: Zero servo complete	33: Zero servo complete
						37: During run 2	37: During frequency output
						—	38: Drive enabled
						—	39: Kilowatt hour output
						—	3C: Operation mode
						—	3D: Speed Search
						—	3E: PID feedback fault (during loss)
						—	3F: PID feedback too high (fault)
						—	4A: During KEB
						—	4B: During Short Braking
						—	4C: During Fast Stop
						—	4D: oH pre-alarm time limit
						—	4E: During Rr
						—	4F: During Rh
						—	60: Internal Cooling fan fault
						—	61: Pole detection complete
						—	90 to 92: DriveWorksEZ, outputs 1-3
						—	100 to 192: Reverse Output of 0-92
Analog Input	Signal level selection (terminal 13) (terminal A1 for A1000)	H3-01	0	H3-01	0	In A1000, terminal A1 is multi-functional input terminal.	
						H3-01	H3-01
						0: 0 to +10 V	0: 0 to +10 V (uses lower limit)
						1: -10 to 10 V	1: 0 to ±10 V (no lower limit)
	Terminal A1 Function Selection	—	—	H3-02	0	Parameter H3-02 should be set to 0 in A1000.	
	Gain (terminal 13) (terminal A1 for A1000)	H3-02	100.0 %	H3-03	100.0 %	—	
				F2-02	100.0 %	Set this parameter when using an analog option card to determine the bias for the analog reference.	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Analog Input	Bias (terminal 13) (terminal A1 for A1000)	H3-03	0.0 %	H3-04	0.0 %	—	
				F2-03	0.0 %	Set this parameter when using an analog option card to determine the bias for the analog reference.	
	Signal level selection (terminal 16) (terminal A3 for A1000)	H3-04	0	H3-05	0	H3-04	H3-05
						0: 0 to +10 V	0: 0 to +10 V (uses lower limit)
						1: -10 to 10 V	1: 0 to ±10 V (no lower limit)
	Multi-functional analog input (terminal 16) (terminal A3 for A1000)	H3-05	0	H3-06	2	H3-05, H3-09	H3-06, H3-10
						0: Terminal A1 bias	0: Main Frequency reference
						1: Frequency reference gain	1: Frequency gain
						2: Auxiliary freq ref 1	2: Auxiliary freq ref 1
						—	3: Analog frequency reference
						4: Output voltage bias	4: Output voltage bias
						5: Accel/decel time gain	5: Accel/decel time gain
						6: DC Injection Braking current	6: DC Injection Braking current
						7: Torque detection level	7: Torque detection level
						8: Stall Prevention level during run	8: Stall Prevention level during run
						9: Output freq lower limit level	9: Output freq lower limit level
						A: Jump frequency	No setting necessary
						B: PID feedback	B: PID feedback
						C: PID setpoint	C: PID setpoint
						D: Frequency bias 2	D: Frequency bias 2
						—	E: Motor temperature Input
						—	F: Through Mode
						10: FWD torque limit	10: FWD torque limit
						11: REV torque limit	11: REV torque limit
						12: Torque limit during regen	12: Torque limit during regen
						13: Torque ref/speed limit during Torque Control	13: Torque ref/speed limit during Torque Control
						14: Torque compensation	14: Torque compensation
						15: P/N both side torque limit	15: P/N both side torque limit
						—	16: PID feedback difference
						1F: Not used for H3-05, H3-09 set for frequency reference	1F: Through-mode
						—	30 to 32: DriveWorkEZ, Analog input 1 to 3
	Gain (terminal 16) (terminal A3 for A1000)	H3-06	100.0 %	H3-07	100.0%	—	
	Bias (terminal 16) (terminal A3 for A1000)	H3-07	0.0 %	H3-08	0.0%	—	
	Signal Level Selection (terminal 14) (terminal A2 for A1000)	H3-08	2	H3-09	2	H3-08	H3-09
						0: 0 to +10 V	0: 0 to +10 V (uses lower limit)
						1: -10 to 10 V	1: 0 to ±10 V (no lower limit)
						2: 4 to 20 mA	2: 4 to 20 mA
						—	3: 0 to 20 mA
	Multi-function analog input (terminal 14) (terminal A2 for A1000)	H3-09	1F*	H3-10	0*	*See the “Comments” column for H3-06.	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)		
		No.	Default	No.	Default	G5	A1000	
Analog Input	Gain (terminal 14) (terminal A2 for A1000)	H3-10	100.0 %	H3-11	100.0 %	—		
	Bias (terminal 14) (terminal A2 for A1000)	H3-11	0.0 %	H3-12	0.0%	—		
	Analog Input Filter Time Constant	H3-12	0.03 s	H3-13	0.03 s	—		
	Analog Input Terminal Enable Selection	—	—	H3-14	7	—	H3-14	
						—	1: Terminal A1 enabled	
						—	2: Terminal A2 enabled	
						—	3: Terminals A1, A2 enabled	
						—	4: Terminal A3 enabled	
						—	5: Terminals A1, A3 enabled	
						—	6: Terminals A2, A3 enabled	
						—	7: Terminals A1, A2, and A3 enabled	
Multi-Function Analog Output	Monitor Selection (terminal 21) (terminal FM for A1000)	H4-01	2*	H4-01	102*	*Refer to the “Comments” column for F4-01		
	Gain (terminal 21) (terminal FM for A1000)	H4-02	1.00	H4-02	100.0 %	Setting units differ between G5 and A1000. Set A1000 by multiplying H4-05 in G5 by 100.		
	Bias (terminal 21) (terminal FM for A1000)	H4-03	0.0 %	H4-03	0.0 %	—		
	Monitor Selection (terminal 23) (terminal FM for A1000)	H4-04	3*	H4-04	103*	*Refer to the “Comments” column for F4-01		
	Gain (terminal 23) (terminal FM for A1000)	H4-05	0.50	H4-05	50.0 %	Setting units differ between G5 and A1000. Set A1000 by multiplying H4-05 in G5 by 100.		
	Bias (terminal 23) (terminal FM for A1000)	H4-06	0.0 %	H4-06	0.0 %	—		
	Multi-Function Analog Output Signal Level Selection	H4-07	0	H4-07 (FM monitor)	0	H4-07	H4-07 Terminal FM Signal Level Selection	H4-08 Terminal AM Signal Level Selection
						0: 0 to +10 V output	0: 0 to 10 V	
				H4-08 (AM monitor)	0	1: 0 to ±10 V output	1: -10 to 10 V	
						—	2: 4 to 20 mA	
MEMOBUS Communication	Station Address	H5-01	1F	H5-01	1F	—		
	Communication Speed Selection	H5-02	3	H5-02	3	H5-02	H5-02	
						0: 1200 bps	0: 1200 bps	
						1: 2400 bps	1: 2400 bps	
						2: 4800 bps	2: 4800 bps	
						3: 9600 bps	3: 9600 bps	
						4: 19200 bps	4: 19200 bps	
						—	5: 38400 bps	
						—	6: 57600 bps	
						—	7: 76800 bps	
						—	8: 115200 bps	
	Communication Parity Selection	H5-03	0	H5-03	0	H5-03	H5-03	
						0: No parity	0: No parity	
						1: Even parity	1: Even parity	
						2: Odd parity	2: Odd parity	
MEMOBUS Communication	Stopping Method After Communication Error	H5-04	3	H5-04	0	H5-04	H5-04	
						0: Ramp to stop	0: Ramp to stop	
						1: Coast to stop	1: Coast to stop	
						2: Fast Stop	2: Fast Stop	
						3: Alarm Only	3: Alarm Only	
	Communication Error Detection Selection	H5-05	1	H5-05	0	H5-05	H5-05	
						0: Disabled	0: Disabled	
						1: Enabled	1: Enabled	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Motor Protection Function	Motor Protection Selection*	L1-01	1	—	—	*For setting details, see the description for E1-02 in G5	
	Motor Protection Time Constant	L1-02	8.0 min.	L1-02	1.0 min.	—	
Momentary Power Loss Process	Momentary Power Loss Operation	L2-01	0	L2-01	0	L2-01 0: Disabled 1: Enabled 2: CPU enabled run — — —	L2-01 0: Disabled 1: Enabled 2: CPU enabled run 3: KEB operation 4: KEB deceleration as long as CPU has power. 5: KEB deceleration to stop.
	Momentary Power Loss Ride-Thru Time	L2-02	0.7*	L2-02	*	*Depends on drive capacity.	
	Momentary Power Loss Minimum Baseblock Time	L2-03	0.5*	L2-03	*	*Depends on drive capacity.	
	Momentary Power Loss Voltage Recovery Ramp Time	L2-04	0.3*	L2-04	*	*Depends on drive capacity.	
	Undervoltage Detection Level	L2-05	190 V*	L2-05	190 V*	*Double this value for 400 V classs drives. Multiply by 3 for 600 V class. If E1-01 is set lower than 400, then set 350 V for A1000.	
	KEB Deceleration Rate	L2-06	0.0	L2-06	0.0 s	—	
Stall Prevention Function	Stall Prevention Selection during Acceleration	L3-01	1	L3-01	1	L3-01 0: Disabled 1: General purpose 2: Intelligent acceleration	L3-01 0: Disabled 1: General purpose 2: Intelligent acceleration
	Stall Prevention Level during Acceleration	L3-02	150 %	L3-02	150%*	*Upper limit is determined by L8-38.	
	Stall Prevention Limit during Acceleration	L3-03	50 %	L3-03	50%	—	
	Stall Prevention Selection during Deceleration	L3-04	1	L3-04	1	L3-04 0: Disabled 1: Enabled 2: Intelligent deceleration 3: Enabled (with braking resistor) — —	L3-04 0: Disabled 1: Enabled 2: Intelligent deceleration 3: Enabled (with braking resistor) 4: Overexcitation braking 5: Overexcitation deceleration 2
	Stall Prevention Selection during Running	L3-05	1	L3-05	1	L3-05 0: Disabled 1: Enabled (Decel Time 1) 2: Enabled (Decel Time 2)	L3-05 0: Disabled 1: Enabled (Decel Time 1) 2: Enabled (Decel Time 2)
	Stall Prevention Level during Running	L3-06	160 %	L3-06	150 %*	*Upper limit is determined by L8-38.	
Frequency Detection	Speed Agree Detection Level	L4-01	0.0 Hz	L4-01	0.0 Hz	—	
	Speed Agree Detection Width	L4-02	2.0 Hz	L4-02	2.0 Hz	—	
	Speed Agree Detection Level (+/-)	L4-03	0.0 Hz	L4-03	0.0 Hz	—	
	Speed Agree Detection Width (+/-)	L4-04	2.0 Hz	L4-04	2.0 Hz	—	
	Operation when Frequency Reference is Missing	L4-05	0	L4-05	0	L4-05 0: Stop 1: Continue operating at 80% speed In A1000, the setting range for the frequency reference when the reference is lost (L4-06) is 0 to 100 % (default: 80%)	L4-05 0: Stop 1: Continue operating at the level set to L4-06
Fault Restart	Number of Auto Restart Attempts	L5-01	0 times	L5-01	0 times	—	
	Auto Restart Operation Selection	L5-02	0	L5-02	0	L5-02 0: No output 1: Outputs during restart	L5-02 0: No output 1: Outputs during restart

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Overtorque Detection	Torque Detection Selection 1	L6-01	0	L6-01	0	L6-01, L6-04	L6-01, L6-04
						0: Disabled	0: Disabled
						1: oL3 detection only active during speed agree, operation continues after detection	1: oL3 detection only active during speed agree, operation continues after detection
						2: oL3 detection always active during run, operation continues after detection	2: oL3 detection always active during run, operation continues after detection
						3: oL3 detection only active during speed agree, output shuts down on an oL3 fault	3: oL3 detection only active during speed agree, output shuts down on an oL3 fault
						4: oL3 detection always active during run, output shuts down on an oL3 fault	4: oL3 detection always active during run, output shuts down on an oL3 fault
						—	5: UL3 detection only active during speed agree, operation continues after detection
						—	6: UL3 detection always active during run, operation continues after detection
						—	7: UL3 detection only active during speed agree, output shuts down on an oL3 fault
						—	8: UL3 detection always active during run, output shuts down on an oL3 fault
						Undertorque detection levels can be set in A1000.	
	Torque Detection Level 1	L6-02	150 %	L6-02	150 %	—	
	Torque Detection Time 1	L6-03	0.1 s	L6-03	0.1 s	—	
	Torque Detection Selection 2	L6-04	0*	L6-04	0*	*See the description for L6-01	
	Torque Detection Level 2	L6-05	150 %	L6-05	150%	—	
	Torque Detection Time 2	L6-06	0.1 s	L6-06	0.1 s	—	
Torque Limit	Forward Torque Limit	L7-01	200 %	L7-01	200 %	—	
	Reverse Torque Limit	L7-02	200 %	L7-02	200 %	—	
	Forward Regenerative Torque Limit	L7-03	200 %	L7-03	200 %	—	
	Reverse Regenerative Torque Limit	L7-04	200 %	L7-04	200 %	—	

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Hardware Protection	Protect Selection for Internal DB Resistor (Type ERF)	L8-01	0	L8-01	0*	L8-01	L8-01
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
						*Depends on drive capacity	
	Overheat Pre-Alarm Level	L8-02	95°C	L8-02	*	*Depends on drive capacity.	
	Operation Selection after Overheat Pre-Alarm	L8-03	3	L8-03	3	L8-03	L8-03
						0: Ramp to stop	0: Ramp to stop
						1: Coast to stop	1: Coast to stop
						2: Fast Stop	2: Fast Stop
						3: Alarm Only	3: Alarm Only
						–	4: Reduce the frequency and continue operation
	Input Open-Phase Protection Selection	L8-05	0	L8-05	1	L8-05	L8-05
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
	Output Open-Phase Protection Selection	L8-07	1	L8-07	1	L8-07	L8-07
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled (triggered by a single phase loss)
						–	2: Enabled (triggered when two phases are lost)
	Ground Protection Selection	L8-10	1	L8-09	1	L8-10	L8-09
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
	Carrier Frequency Reduction Selection	L8-17	1	L8-38	2*	L8-17	L8-38
						0: No reduction	0: No derating
						1: With carrier frequency reduction	1: Derating when overload below 6 Hz
						2: For factory adjustments	2: Frequency derating with overload
						3: For factory adjustments	
						*Depends on drive capacity.	
	oL2 Characteristics Selection at Low Speeds	L8-19	0	L8-15	1	L8-19	L8-15
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
Display Setting/ Selection	Monitor Selection	o1-01	6*	o1-01	106*	*See the “comments” column for parameter F4-01.	
	Monitor Selection After Power Up	o1-02	1	o1-02	1	o1-02	o1-02
						1: Frequency reference	1: Frequency reference
						2: Output frequency	3: Output frequency
						3: Output current	4: Output current
						4: Determined by o1-01	5: Determined by o1-01
						–	2: RWD/REV

Parameter Name		G5		A1000		Comments (Gray shading indicates default settings)	
		No.	Default	No.	Default	G5	A1000
Display Setting/ Selection	Frequecny units of reference setting and monitor	o1-03	0	o1-03	0	o1-03	o1-03
						0: 0.01 Hz units	0: 0.01 Hz units
						1: 0.01% units	1: 0.01% units
						2 to 39: r/min units	2: r/min units
						40 to 39999: User-set units	3: User-set units
							o1-10: 1 to 60000 / o1-11: 0 to 3
						o1-10: Determines how the units for the frequency reference.	
						o1-11: Sets the decimal point for the frequency reference display.	
						Ex. : For a max output frequency of 200.0, set the following:	
						Setting value : o1-03 = 12000	Setting value: o1-03=3 : o1-10=2000 : o1-11=1
						1 2 0 0 0 ┘ └ Max value, excluding decimal point → o1-10="2000" └── digits displayed to the right of the decimal → o1-11= 1	
	Frequency units of constant setting	o1-04	0	o1-04	0	o1-04	o1-04
						0: Hz units	0: Hz units
						1: r/min units	1: r/min units
	Constant No. display selection	o1-05	0	—	—	o1-05	—
						0: Normally display	No need to set
						1: Display MEMOBUS reg.	Not available in A1000
Multi-Function Selection	LOCAL/REMOTE Key Enable/Disable	o2-01	1	o2-01	1	o2-01	o2-01
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
	STOP Key During Control Circuit Terminal Operation	o2-02	1	o2-02	1	o2-02	o2-02
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
	User Constant Initial Value	o2-03	0	o2-03	0	o2-03	o2-03
						0: No change	0: No change
						1: Save values	1: Save values
						2: Clear memory	2: Clear memory
	kVA Selection	o2-04	*	o2-04	*	*Do not change this setting. Depends on drive capacity.	
	Frequency Reference Setting Method Selection	o2-05	0	o2-05	0	o2-05	o2-05
						0: ENTER required	0: ENTER required
						1: ENTER key not required	1: ENTER key not required
	Operation Selection when Digital Operator is Disconnected	o2-06	1	o2-06	1	o2-06	o2-06
						0: Disabled	0: Disabled
						1: Enabled	1: Enabled
	Cumulative Operation Time Setting	o2-07	0H	o4-01	0 H	—	
	Cumulative Operation Time Selection	o2-08	0	o4-02	0	o2-08	o4-02
						0: Whenever the power is on	0: Whenever the power is on
						1: During run only	1: During run only
	Initialize Mode Selection	o2-09	1*	o2-09	*	*Do not change this setting.	

◆ Difference in Parameter Setting Ranges

- **Initialize (G5, A1000 both use A1-03)**
  G5: 0/1110/2220/3330
  A1000: 0/1110/2220/33300/5550 (OPE04 error reset)
- **Timer Function Delay Times (G5, A1000 both use b4-01(b4-02))**
  G5: 0.0 to 300.0 s
  A1000: 0.0 to 3000.0 s
- **S-Curve Characteristics Time (G5, A1000 both use C2-01 to C2-04)**
  G5: 0.0 to 2.50 s
  A1000: 0.0 to 10.00 s
- **Torque Compensation Primary Delay Time Constant (G5, A1000 both use C4-02)**
  G5: 0 to 10000 ms
  A1000: 0 to 60000 ms
- **Carrier Frequency Upper Limit (G5: C6-01, A1000: C6-03)**
  G5: 0.4 to 15.0 kHz
  A1000: 1.0 to 15.0 kHz
- **Carrier Frequency Lower Limit (G5: C6-02, A1000: C6-04)**
  G5: 0.4 to 15.0 kHz
  A1000: 1.0 to 15.0 kHz
- **Analog Output 1(2) Monitor Selection (G5, A1000 both use F4-01(F4-03))**
  G5: 1 to 38 (enter the last two digits of the monitor to output: U1-□□)
  A1000: 000 to 999 (enter the last two digits of the monitor to output: U1-□□)
- **Analog Output 1(2) Monitor Gain (G5, A1000 both use F4-02 (F4-04))**
  G5: 0.00 to 2.50
  A1000: -999.9% to 999.9%
- **Analog Output 1(2) Monitor Bias (G5, A1000 both use F4-05(F4-06))**
  G5: -10.0% to 10.0%
  A1000: -999.9% to 999.9%
- **Digital Output 1 to 8 Output Selection (G5, A1000 both use F5-01 to F5-08)**
  G5: 0 to 37
  A1000: 0 to 192
- **Multi-Function Input Terminal S3 (S1 in A1000) to S8 Function Selection (G5: H1-01 to H1-06, A1000: H1-01 to H1-08)**
  G5: 0 to 77
  A1000: 0 to 9F
- **Multi-Function Contact Output (G5, A1000 both use H2-01 to H2-03)**
  G5: 0 to 37
  A1000: 0 to 192
- **Analog Input Terminal A1Gain (G5: H3-02, A1000: H3-03)**
  A3 Gain (G5: H3-06, A1000: H3-07)
  A2 Gain (G5: H3-10, A1000: H3-11)
- **Analog Input Terminal A1 Bias (G5: H3-03, A1000: H3-04)**
  A3 Bias (G5: H3-07, A1000: H3-08)
  A2 Bias (G5: H3-11, A1000: H3-12)
  G5: -100.0% to +100.0%
  A1000: -999.9% to 999.9%

- **Analog Input Terminal A1 Function Selection (G5: N/A , A1000: H3-02)**
  A3 Function Selection (G5: H3-05, A1000: H3-06)
  A2 Function Selection (G5: H3-09, A1000: H3-10)
  G5: 0 to 1F
  A1000: 0 to 31
- **Analog Output FM (AM) Monitor Selection (G5, A1000 both use H4-01 (H4-04))**
  G5: 1 to 38 (enter the last two digits of the monitor to output: U1-□□)
  A1000: 000 to 999 (enter the last two digits of the monitor to output: U1-□□)
- **Analog Output Terminal FM (AM) Gain (G5, A1000 both use H4-02 (H4-05))**
  G5: 0.00 to 2.50
  A1000: -999.9% to 999.9%
- **Analog Output Terminal FM (AM) Bias (G5, A1000 both use H4-03 and H4-06)**
  G5: -10.0% to +10.0%
  A1000: -999.9% to 999.9%
- **KEB Deceleration Time (G5, A1000 both use L2-06)**
  G5: 0.0 to 100.0 s
  A1000: 0.00 to 6000.0 s
- **Stall Prevention Level during Acceleration(G5, A1000 both use L3-02)**
  G5: 0 to 200%
  A1000: 0 to 150%
- **Stall Prevention Level during Run(G5, A1000 both use L3-06)**
  G5: 30 to 200%
  A1000: 30 to 150%
- **Drive Mode Display Selection (G5, A1000 both use o1-01)**
  G5: 4 to 38 (enabled when o1-02 = 4)
  A1000: 104 to 4□□, 5□□, 6□□, 8□□ (enabled when o1-02 = 5)
- **Monitor Display at Power Up(G5, A1000 both use o1-02)**
  G5: 1 to 4
  A1000: 1 to 5

Table 24 Frequency Reference Setting/Display Units (G5, A1000 both use o1-03)

G5: 0 to 39999	A1000: 0 to 3
0: 0.01 Hz units (default) 1: 0.01 % units 2 to 39: r/min units (set the number of motor poles) 40 to 39999: User-set display (displayed when using the max output frequency)	0 : 0.01 Hz units (default) 1 : 0.01% units 2 : r/min units (calculated by the max output frequency and the no. of motor poles) 3 : User-set units (set using parameters o1-10 and o1-11)

- **Cumulative Operation Time Setting(G5: o2-07, A1000: o4-01)**
  G5: 0 to 65535H (set in hour units)
  A1000: 0 to 9999H (set in 10 hour units)

11 Appendix 3 Terminal Size and Wire Gauge

◆ Terminal Size and Wire Gauge

The table below lists the wiring sizes based on national electrical codes. Gauges are recommended, and users may select different gauges at their own discretion. For wire gauges applicable in the United States refer to "Chapter 3. Electrical Installation" of the A1000 Quick Start Guide (TOEPC71061641).

Table 25 3-Phase 240 V Class Main Circuit Terminal Size and Wire Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Wire Range mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	20P4 20P7	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2, ⏚	M4	–	2 to 5.5 (14 to 10)	–
A1000	2A0004 2A0006 2A0008	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2,	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	2 (14)
		⏚				5.5 (10)
G5	21P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2	M4	–	2 to 5.5 (14 to 10)	–
		⏚			3.5 to 5.5 (12 to 10)	
A1000	2A0010	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2,	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	14, 10 (Ground)
		⏚				5.5 (10)
G5	22P2	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2, ⏚	M4	–	3 to 5.5 (12 to 10)	–
A1000	2A0012	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2 ⏚	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	4 (12) for RST 2 (14) for UVW
						5.5 (10)
G5	23P7	R/L1,S/L2,T/L3, U/T1,V/T2,W/T3, -,+1, +2, B1, B2, ⏚	M4	–	5.5 (10)	–
A1000	2A0021	R/L1,S/L2,T/L3, -,+1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	3.3 to 5.5 (12 to 10)	5.5 (10)
		U/T1,V/T2,W/T3, ⏚				
		B1, B2			2 to 5.5 (14 to 10)	
G5	25P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2,	M5	–	8 (8)	–
		⏚			5.5 to 8 (10 to 8)	

11 Appendix 3 Terminal Size and Wire Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Wire Range mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
A1000	2A0030	R/L1, S/L2, T/L3, -, +1, +2	M4	1.2 to 1.5	5.5 to 14 (10 to 6)	8 (8)
		U/T1, V/T2, W/T3	M4	1.2 to 1.5	5.5 to 14 (10 to 6)	8 (8)
		B1, B2	M4	1.2 to 1.5	2 to 5.5 (14 to 10)	–
		⏚	M5	2 to 2.5	5.5 to 8 (10 to 8)	8
G5	27P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2,	M5	–	8 (8)	–
		⏚	M5	–	5.5 to 8 (10 to 8)	–
A1000	2A0040	R/L1, S/L2, T/L3, -, +1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	14 (6)	6
		U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.6 to 13.3)	8 to 14 (8 to 6)	8
		B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	3.5 to 5.5 (12 to 10)	-
		⏚	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 8 (10 to 8)	8 (8)
G5	2011	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2,	M6	–	22 (4)	–
		⏚	M6	–	8 (8)	–
A1000	2A0056	R/L1, S/L2, T/L3, -, +1, +2	M6	4 to 6 (35.4 to 53.1)	14 to 22 (6 to 4)	22 (4)
		U/T1, V/T2, W/T3	M6	4 to 6 (35.4 to 53.1)	14 to 22 (6 to 4)	22 (4)
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	–
		⏚	M6	4 to 6 (35.4 to 53.1)	8 to 14 (8 to 6)	14 (6)
G5	2015	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2	M6	–	30 (3)	–
		⏚	M6	–	8 (8)	–
A1000	2A0069	R/L1, S/L2, T/L3, -, +1, +2	M8	9 to 11 (79.7 to 97.4)	22 to 30 (4 to 3)	30 (3)
		U/T1, V/T2, W/T3,	M8	9 to 11 (79.7 to 97.4)	22 to 30 (4 to 3)	30 (3)
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	8 to 14 (8 to 6)	–
		⏚	M6	4 to 6 (35.4 to 53.1)	14 to 22 (6 to 4)	14 (6)
G5	2018	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2	M8	–	30 (3)	–
		r,	M4	–	0.5 to 5.5 (20 to 10)	–
		⏚	M8	–	14 (6)	–

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Wire Range mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
A1000	2A0081	R/L1, S/L2, T/L3, -, +1, +2	M8	9 to 11 (79.7 to 97.4)	30 to 38 (3 to 2)	38 (2)
		U/T1, V/T2, W/T3	M8	9 to 11 (79.7 to 97.4)	30 to 38 (3 to 2)	38 (2)
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	14 (6)	—
		⏚	M6	4 to 6 (35.4 to 53.1)	14 to 22 (6 to 4)	14 (6)
G5	2022	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, +3 R1/L11, S1/L21, T1/L31	M8	—	30 (3)	—
		⏚	M6	—	14 (6)	—
		r,	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	2A0110	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M8	9 to 11 (79.7 to 97.4)	30 to 50 (3 to 1/0)	50 (1/0)
		-, +1	M8	9 to 11 (79.7 to 97.4)	38 to 50 (2 to 1)	—
		B1, B2	M8	9 to 11 (79.7 to 97.4)	14 to 50 (6 to 1)	—
		⏚	M8	9 to 11 (79.7 to 97.4)	14 to 22 (6 to 4)	14 (6)
G5	2030	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, R1/L11, S1/L21, T1/L31	M10	—	100 (4/0)	—
		—, +3	M8	—	22 (4)	—
		⏚	M8	—	22 (4)	—
		r,	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	2A0138	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	50 to 60 (1 to 2/0)	60 (2/0)
		-, +1	M10	18 to 23 (159 to 204)	50 to 80 (1/0 to 3/0)	—
		B1, B2	M10	18 to 23 (159 to 204)	22 to 60 (4 to 2/0)	—
		⏚	M8	9 to 11 (79.7 to 97.4)	22 (4)	22 (4)
G5	2037	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, R1/L11, S1/L21, T1/L31	M10	—	60 x 2P (1/0 x 2P)	—
		+3	M8	—	22 (4)	—
		⏚	M8	—	22 (4)	—
		r,	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	2A0169	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	60 to 20 (2/0 to 4/0)	120 (4/0)
		-, +1	M10	18 to 23 (159 to 204)	50 to 120 (1 to 4/0)	120 (4/0)
		+3	M10	18 to 23 (159 to 204)	50 to 120 (1/0 to 4/0)	—
		⏚	M8	18 to 23 (159 to 204)	22 to 70 (4 to 2/0)	22 (4)

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Wire Range mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	2055	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3,	M10	–	60 x 2P (1/0 x 2P)	–
		-, +3	M8	–	30 (3)	–
		⏚	M8	–	30 (3)	–
		r,	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	2A0250	R/L1, S/L2, T/L3	M12	32 to 40 (283 to 354)	95 to 150 (3/0 to 300)	300 (3/0×2P)
		U/T1, V/T2, W/T3	M12	32 to 40 (283 to 354)	95 to 150 (3/0 to 300)	300 (3/0×2P)
		-, +1	M12	32 to 40 (283 to 354)	95 to 150 (3/0 to 300)	–
		+3	M10	18 to 23 (159 to 204)	35 to 150 (2 to 300)	–
		⏚	M12	32 to 40 (283 to 354)	35 to 150 (2 to 300)	30 (3)
G5	2075	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M12	–	100 x 2p (4/0 x 2P)	–
		-, +3	M8	–	50 (1)	–
		⏚	M8	–	50 (1)	–
		r,	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	2A0312	R/L1, S/L2, T/L3	M12	32 to 40 (283 to 354)	95 to 150 (3/0 to 300)	100 x 2P (4/0×2P)
		U/T1, V/T2, W/T3	M12	32 to 40 (283 to 354)	95 to 150 (3/0 to 300)	80 x 2P (3/0×2P)
		-, +1	M12	32 to 40 (283 to 354)	95 to 150 (3/0 to 300)	–
		+3	M10	18 to 23 (159 to 204)	95 to 150 (3/0 to 300)	–
		⏚	M12	32 to 40 (283 to 354)	35 to 150 (2 to 300)	35 (2)

Table 26 3-Phase 400 V Class Main Circuit Terminal Size and Wire Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	40P4 40P7	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2,?B1, B2, ⏚	M4	–	2 to 5.5 (14 to 10)	–
A1000	4A0002 4A0004	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2, ⏚	M4	1.2 to 1.5 (10.6 to 13.2)	2 to 5.5 (14 to 10)	2 (14)
G5	41P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2, ⏚	M4	–	2 to 5.5 (14 to 10)	–
A1000	4A0005 4A0007	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2	M4	1.2 to 1.5 (10.6 to 13.2)	2 to 5.5 (14 to 10)	2 (14)
		⏚	M4	1.2 to 1.5 (10.6 to 13.2)	3.5 to 5.5 (12 to 10)	3.5 (12)

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	43P7	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2	M4	–	2 to 5.5 (14 to 10)	–
		⏚	M4	–	3.5 to 5.5 (12 to 10)	–
A1000	4A0011	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	3.5 (12)
		⏚	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	5.5 (10)
G5	45P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2 ⏚	M4	–	3.5 to 5.5 (12 to 10)	–
A1000	4A0018	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	3.5 to 14 (12 to 6)	5.5 (10)
		B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	3.5 to 14 (12 to 6)	5.5 (10)
		⏚	M5	2 to 2.5 (17.7 to 22.1)	2 to 5.5 (14 to 10)	5.5 (10)
G5	47P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2 ⏚	M4	–	8 to 14 (8 to 6)	–
A1000	4A0023	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	5.5 to 14 (10 to 6)	5.5 (10)
		B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	3.5 to 5.5 (12 to 10)	5.5 (10)
		⏚	M5	2 to 2.5 (17.7 to 22.1)	3.5 to 5.5 (12 to 10)	5.5 (10)
G5	4011	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2	M5	–	8 to 14 (8 to 6)	–
		⏚	M5	–	8 (8)	–
A1000	4A0031	R/L1, S/L2, T/L3, -, +1, +2	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	8 (8)
		U/T1, V/T2, W/T3	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	8 (8)
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	10 to 8 (5.5 to 8)	-
		⏚	M6	4 to 6 (35.4 to 53.1)	10 to 8 (5.5 to 8)	8 (8)
G5	4015	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2	M5	–	8 to 14 (8 to 6)	–
		⏚	M6	–	8 (8)	–
A1000	4A0038	R/L1, S/L2, T/L3,	M5	2 to 2.5 (17.7 to 22.1)	8 to 14 (8 to 6)	14 (6)
		U/T1, V/T2, W/T3	M5	2 to 2.5 (17.7 to 22.1)	8 to 14 (8 to 6)	8 (6)
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 8 (10 to 8)	–
		⏚	M6	4 to 6 (35.4 to 53.1)	5.5 to 14 (10 to 6)	14 (6)

11 Appendix 3 Terminal Size and Wire Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	4018	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, +3	M6	–	14 (6)	–
		⏚	M8	–	8 (8)	–
		r,	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	4A0044	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2	M6	4 to 6 (35.4 to 53.1)	14 to 22 (6 to 4)	14 (6)
		B1, B2	M5	9 to 11 (79.7 to 97.4)	5.5 to 8 (10 to 8)	–
		⏚	M6	9 to 11 (79.7 to 97.4)	8 to 14 (8 to 6)	14 (6)
G5	4022	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +3,	M6	–	22 (4)	–
		⏚	M8	–	8 (8)	–
		r,	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	4A0058	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M8	9 to 11 (79.7 to 97.4)	14 to 22 (6 to 4)	22 (4)
		-, +1	M8	9 to 11 (79.7 to 97.4)	14 to 50 (6 to 1)	22 (4)
		B1, B2	M8	9 to 11 (79.7 to 97.4)	8 to 22 (8 to 4)	14 (6)
		⏚	M8	9 to 11 (79.7 to 97.4)	8 to 14 (8 to 6)	14 (6)
G5	4030	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +3,	M8	–	22 (4)	–
		⏚	M8	–	8 (8)	–
		r,	M8	–	0.5 to 5.5 (20 to 10)	–
A1000	4A0072	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M8	9 to 11 (79.7 to 97.4)	22 to 30 (4 to 3)	22 (4)
		-, +1	M8	9 to 11 (79.7 to 97.4)	22 to 50 (4 to 1)	–
		B1, B2, ⏚	M8	9 to 11 (79.7 to 97.4)	14 (6)	14 (6)
G5	4037	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, +3	M8	–	30 (3)	–
		⏚	M8	–	14 (6)	–
		r,	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	4A0088	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M8	9 to 11 (79.7 to 97.4)	30 to 50 (3 to 1/0)	35 (2)
		-, +1	M8	9 to 11 (79.7 to 97.4)	30 to 50 (3 to 1/0)	–
		+3	M8	9 to 11 (79.7 to 97.4)	14 to 50 (6 to 1/0)	–
		⏚	M8	9 to 11 (79.7 to 97.4)	14 to 22 (6 to 4)	22 (4)
G5	4045	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, +3	M8	–	50 (1)	–
		⏚	M8	–	14 (6)	–
		r,	M4	–	0.5 to 5.5 (20 to 10)	–

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
A1000	4A0103	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M8	9 to 11 (79.7 to 97.4)	35to 50 (2 to 1/0)	50 (1/0)
		-, +1	M8	9 to 11 (79.7 to 97.4)	30 to 50 (3 to 1/0)	—
		+3	M8	9 to 11 (79.7 to 97.4)	22 to 50 (4 to 1/0)	—
		⏚	M8	9 to 11 (79.7 to 97.4)	14 to 22 (6 to 4)	22 (4)
G5	4055	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M10	—	100 (4/0)	—
		+3	M8	—	22 (4)	—
		⏚	M8	—	22 (4)	—
		r, ⚠200, ⚠400	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	4A0139	R/L1, S/L2, T/L3	M10	18 to 23 (159 to 204)	50 to 100 (1/0 to 4/0)	95 (3/0)
		U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	50 to 100 (1/0 to 4/0)	60 (2/0)
		-, +1	M10	18 to 23 (159 to 204)	50 to 100 (1/0 to 4/0) 0	—
		+3	M10	18 to 23 (159 to 204)	30 to 100 (3 to 4/0)	—
		⏚	M10	18 to 23 (159 to 204)	22 (4)	22 (4)
G5	4075	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M10	—	60 x 2P (1/0 x 2P)	—
		-, +3	M8	—	22 (4)	—
		⏚	M8	—	22 (4)	—
		r, ⚠200, ⚠400	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	4A0165	R/L1, S/L2, T/L3	M10	18 to 23 (159 to 204)	95 to 120 (3/0 to 4/0)	120 (4/0)
		U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	95 to 120 (3/0 to 4/0)	120 (4/0)
		-, +1	M10	18 to 23 (159 to 204)	50 to 120 (1/0 to 4/0)	—
		+3	M10	18 to 23 (159 to 204)	50 to 120 (1/0 to 4/0)	—
		⏚	M10	18 to 23 (159 to 204)	22 to 35 (4 to 2)	22 (4)
G5	4090	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M10	—	60 to 100 (2/0 to 4/0)	—
		—, +3	M8	—	60 (2/0)	—
		⏚	M8	—	30 (3)	—
		r, ⚠200, ⚠400	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	4A0208	R/L1, S/L2, T/L3	M10	18 to 23 (159 to 204)	30 to 150 (2 to 300)	150 (300)
		U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	30 to 150 (2 to 300)	150 (300)
		-, +1	M10	18 to 23 (159 to 204)	50 to 135 (1 to 250)	—
		+3	M10	18 to 23 (159 to 204)	30 to 95 (3 to 3/0)	—
		⏚	M10	18 to 23 (159 to 204)	22 to 150 (4 to 300)	22 (4)

11 Appendix 3 Terminal Size and Wire Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	4110	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M10	–	60 x 2P (1/0 to 2P)	–
		-, +3	M8	–	30 (3)	–
		⏚	M8	–	30 (3)	–
		r, 200, 400	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	4A0250	R/L1, S/L2, T/L3	M10	18 to 23 (159 to 204)	50 to 300 (1 to 600)	200 (400)
		U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	50 to 300 (1 to 600)	200 (400)
		-, +1	M10	18 to 23 (159 to 204)	95 to 300 (3/0 to 600)	–
		+3	M10	18 to 23 (159 to 204)	50 to 170 (1/0 to 325)	–
		⏚	M10	18 to 23 (159 to 204)	35 to 185 (2 to 350)	35 (2)
G5	4132	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M12	–	100 to 200 (4/0 to 400)	–
		–, +3	M8	–	60 (2/0)	–
		⏚	M8	–	50 (1)	–
		r, 200, 400	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	4A0296	R/L1, S/L2, T/L3	M12	32 to 40 (283 to 354)	60 to 325 (2/0 to 600)	200 (500)
		U/T1, V/T2, W/T3	M12	32 to 40 (283 to 354)	60 to 325 (2/0 to 600)	200 (500)
		-, +1	M12	32 to 40 (283 to 354)	80 to 325 (3/0 to 600)	–
		+3	M10	18 to 23 (159 to 204)	50 to 170 (1 to 325)	–
		⏚	M12	32 to 40 (283 to 354)	35 to 325 (2 to 350)	35 (2)
G5	4160	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M12	–	100 x 2P (4/0 to 2P)	–
		–, +3	M8	–	50 (1)	–
		⏚	M8	–	50 (1)	–
		r, 200, 400	M4	–	0.5 to 5.5 (20 to 10)	–
A1000	4A0362	R/L1, S/L2, T/L3	M12	32 to 40 (283 to 354)	80 to 325 (3/0 to 600)	250 (300 x 2P)
		U/T1, V/T2, W/T3	M12	32 to 40 (283 to 354)	80 to 325 (3/0 to 600)	250 (300 x 2P)
		-, +1	M12	32 to 40 (283 to 354)	100 to 325 (4/0 to 600)	–
		+3	M10	18 to 23 (159 to 204)	80 to 325 (3/0 to 600)	–
		⏚	M12	32 to 40 (283 to 354)	50 to 200 (1 to 350)	50 (1)
G5	4185	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3, -, +1, +3	M16	–	325 x 2P (MCM650 x 2P)	–
		⏚	M8	–	50 (1/0)	–
		r, 200, 400	M4	–	0.5 to 5.5 (20 to 10)	–

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
A1000	4A0414	R/L1, S/L2, T/L3	M12	32 to 40 (283 to 354)	100 to 150 (4/0 to 300)	125 x 2P (300×2P)
		U/T1, V/T2, W/T3	M12	32 to 40 (283 to 354)	100 to 150 (4/0 to 300)	125 x 2P (300×2P)
		-, +1	M12	32 to 40 (283 to 354)	80 to 150 (3/0 to 300)	—
		+3	M12	32 to 40 (283 to 354)	80 to 150 (3/0 to 300)	—
		⏚	M12	32 to 40 (283 to 354)	50 to 175 (1 to 300)	50 (1)
G5	4220	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +3	M16	—	325 x 2P (MCM650 x 2P)	—
		⏚	M16	—	50 (1/0)	—
		r, ⚠200, ⚠400	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	4A0515	R/L1, S/L2, T/L3	M12	32 to 40 (283 to 354)	80 to 150 (3/0 to 300)	150 x 2P (300×4P)
		U/T1, V/T2, W/T3	M12	32 to 40 (283 to 354)	80 to 150 (3/0 to 300)	150 x 2P (300×4P)
		-, +1	M12	32 to 40 (283 to 354)	50 to 150 (1/0 to 300)	—
		+3	M12	32 to 40 (283 to 354)	50 to 150 (1/0 to 300)	—
		⏚	M12	32 to 40 (283 to 354)	50 to 150 (1/0 to 300)	50 (1/0)
G5	4300	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3 -, +1, +3	M16	—	325 x 2P (MCM650 x 2P)	—
		⏚	M8	—	50 (1/0)	—
		r, ⚠200, ⚠400	M4	—	0.5 to 5.5 (20 to 10)	—
A1000	4A0675	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M12	32 to 40 (283 to 354)	100 to 150 (4/0 to 300)	150 x 2P (300×4P)
		-, +1	M12	32 to 40 (283 to 354)	50 to 150 (1/0 to 300)	—
		+3	M12	32 to 40 (283 to 354)	50 to 150 (1/0 to 300)	—
		⏚	M12	32 to 40 (283 to 354)	60 to 150 (2/0 to 300)	60 (2/0)

Table 27 3-Phase 600 V Class Main Circuit Terminal Size and Wire and Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	51P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M4	—	2 to 5.5 (14 to 10)	—
		-, B1, B2	M4	—	2 to 5.5 (14 to 10)	—
		⏚	M4	—	—	—
A1000	5A0003 5A0004	R/L1, S/L2, T/L3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	2 (14)
		U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	2 (14)
		-, +1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	—
		B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	—
		⏚	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	5.5 (10)

11 Appendix 3 Terminal Size and Wire Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	52P2	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M4	–	2 to 5.5 (14 to 10)	–
		-, B1, B2	M4	–	2 to 5.5 (14 to 10)	–
		⏚	M4	–	–	–
A1000	5A0006	R/L1, S/L2, T/L3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	2 (14)
		U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	2 (14)
		-, +1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	–
		B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	–
		⏚	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	5.5 (10)
G5	53P7	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M4	–	2 to 5.5 (14 to 10)	–
		-, B1, B2	M4	–	2 to 5.5 (14 to 10)	–
		⏚	M4	–	3.5 to 5.5 (12 to 10)	–
A1000	5A0009	R/L1, S/L2, T/L3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	2 (14)
		U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	2 (14)
		-, +1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	–
		B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	–
		⏚	M4	1.2 to 1.5 (10.6 to 13.3)	3.5 to 5.5 (12 to 10)	5.5 (10)
G5	55P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M4	–	3.5 to 5.5 (12 to 10)	–
		-, B1, B2	M4	–	3.5 to 5.5 (12 to 10)	–
		⏚	M4	–	–	–
A1000	5A0011	R/L1, S/L2, T/L3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 14 (14 to 6)	5.5 (10)
		U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 14 (14 to 6)	2 (14)
		-, +1, +2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 14 (14 to 6)	–
		B1, B2	M4	1.2 to 1.5 (10.6 to 13.3)	2 to 5.5 (14 to 10)	–
		⏚	M5	2 to 2.5 (17.7 to 22.1)	3.5 to 8 (12 to 8)	8 (8)
G5	57P5	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M4	–	5.5 (10)	–
		-, B1, B2	M4	–	5.5 (10)	–
		⏚	M4	–	3.5 to 5.5 (12 to 10)	–

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
A1000	5A0017	R/L1, S/L2, T/L3	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	5.5 (10)
		U/T1, V/T2, W/T3	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	5.5 (10)
		-, +1, +2	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	–
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 8 (10 to 8)	–
		⏚	M6	4 to 6 (35.4 to 53.1)	5.5 to 8 (12 to 8)	8 (8)
G5	5011	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M5	–	5.5 to 14 (10 to 6)	–
		-, B1, B2	M5	–	5.5 to 14 (10 to 6)	–
		⏚	M6	–	5.5 to 14 (10 to 6)	–
A1000	5A0022	R/L1, S/L2, T/L3	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	8 (8)
		U/T1, V/T2, W/T3	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	14 (6)
		-, +1, +2	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 14 (10 to 6)	–
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	5.5 to 8 (10 to 8)	–
		⏚	M6	4 to 6 (35.4 to 53.1)	5.5 to 14 (10 to 6)	8 (8)
G5	5015	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	M5	–	8 to 14 (8 to 6)	–
		-, +3	M5	–	8 to 14 (8 to 6)	–
		⏚	M6	–	–	–
A1000	5A0027	R/L1, S/L2, T/L3	M6	4 to 6 (35.4 to 53.1)	14 to 20 (6 to 4)	14 (6)
		U/T1, V/T2, W/T3	M6	4 to 6 (35.4 to 53.1)	14 to 20 (6 to 4)	14 (6)
		-, +1, +2	M6	4 to 6 (35.4 to 53.1)	14 to 20 (6 to 4)	–
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	10 to 8 (5.5 to 8)	–
		⏚	M6	4 to 6 (35.4 to 53.1)	5.5 to 14 (10 to 6)	14 (6)
G5	5018	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M6	–	8 to 14 (8 to 6)	–
		⏚	Pressure Lug	–	5.5 to 14 (10 to 6)	–
		r,	M4	–	2 to 5.5 (14 to 10)	–
A1000	5A0032	R/L1, S/L2, T/L3	M6	4 to 6 (35.4 to 53.1)	14 to 20 (6 to 4)	14 (6)
		U/T1, V/T2, W/T3	M6	4 to 6 (35.4 to 53.1)	14 to 20 (6 to 4)	14 (6)
		-, +1, +2	M6	4 to 6 (35.4 to 53.1)	14 to 20 (6 to 4)	–
		B1, B2	M5	2 to 2.5 (17.7 to 22.1)	10 to 8 (5.5 to 8)	–
		⏚	M6	4 to 6 (35.4 to 53.1)	5.5 to 14 (10 to 6)	14 (6)

11 Appendix 3 Terminal Size and Wire Gauge

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
G5	5022	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M6	–	8 to 14 (8 to 6)	–
		⏚	Pressure Lug	–	5.5 to 14 (10 to 6)	–
		r,	M4	–	2 to 5.5 (14 to 10)	–
A1000	5A0041	R/L1, S/L2, T/L3	M8	9 to 11 (79.7 to 97.4)	5.5 to 30 (10 to 3)	14 (6)
		U/T1, V/T2, W/T3		9 to 11 (79.7 to 97.4)	5.5 to 30 (10 to 3)	14 (6)
		-, +1, +2	M8	9 to 11 (79.7 to 97.4)	14 to 50 (6 to 1)	–
		B1, B2		9 to 11 (79.7 to 97.4)	3 to 30 (12 to 3)	–
		⏚	M8	9 to 11 (79.7 to 97.4)	14 (6)	14 (6)
G5	5030	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M8	–	14 to 50 (6 to 1/0)	–
		⏚	Pressure Lug	–	8 to 30 (8 to 2)	–
		r,	M4	–	2 to 5.5 (14 to 10)	–
A1000	5A0052	R/L1, S/L2, T/L3	M8	9 to 11 (79.7 to 97.4)	5.5 to 30 (10 to 3)	20 (4)
		U/T1, V/T2, W/T3	M8	9 to 11 (79.7 to 97.4)	5.5 to 30 (10 to 3)	14 (6)
		-, +1, +2	M8	9 to 11 (79.7 to 97.4)	14 to 50 (6 to 1)	–
		B1, B2	M8	9 to 11 (79.7 to 97.4)	8 to 30 (8 to 3)	–
		⏚	M8	9 to 11 (79.7 to 97.4)	14 (6)	14 (6)
G5	5037	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M8	–	22 to 50 (4 to 1/0)	–
		⏚	Pressure Lug	–	8 to 30 (8 to 2)	–
		r,	M4	–	2 to 5.5 (14 to 10)	–
A1000	5A0062	R/L1, S/L2, T/L3	M10	18 to 23 (159 to 204)	5.5 to 105 (10 to 4/0)	20 (4)
		U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	5.5 to 105 (10 to 4/0)	20 (4)
		-, +1, +2	M10	18 to 23 (159 to 204)	20 to 105 (4 to 4/0)	–
		B1, B2	M10	18 to 23 (159 to 204)	14 to 105 (6 to 4/0)	–
		⏚	M10	18 to 23 (159 to 204)		20 (4)
G5	5045	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M8	–	30 to 50 (3 to 1/0)	–
		⏚	Pressure Lug	–	8 to 30 (8 to 2)	–
		r,	M4	–	2 to 5.5 (14 to 10)	–

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
A1000	5A0077	R/L1, S/L2, T/L3	M10	18 to 23 (159 to 204)	5.5 to 105 (10 to 4/0)	30 (3)
		U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	5.5 to 105 (10 to 4/0)	30 (3)
		-, +1, +2	M10	18 to 23 (159 to 204)	30 to 105 (3 to 4/0)	—
		B1, B2	M10	18 to 23 (159 to 204)	14 to 105 (6 to 4/0)	—
		⏚	M10	18 to 23 (159 to 204)	20 (4)	20 (4)
G5	5055	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M8	—	30 to 50 (2 to 1/0)	—
		⏚	Pressure Lug	—	22 to 30 (6 to 2)	—
		r,	M4	—	2 to 5.5 (14 to 10)	—
A1000	5A0099	R/L1, S/L2, T/L3	M10	18 to 23 (159 to 204)	5.5 to 105 (10 to 4/0)	50 (1/0)
		U/T1, V/T2, W/T3	M10	18 to 23 (159 to 204)	5.5 to 105 (10 to 4/0)	50 (1)
		-, +1, +2	M10	18 to 23 (159 to 204)	40 to 105 (2 to 4/0)	—
		B1, B2	M10	18 to 23 (159 to 204)	20 to 105 (4 to 4/0)	—
		⏚	M10	18 to 23 (159 to 204)	20 (4)	20 (4)
G5	5075	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M8	—	50 to 60 (2/0 to 1//0)	—
		⏚	Pressure Lug	—	22 to 30 (6 to 2)	—
		r,	M4	—	2 to 5.5 (14 to 10)	—
A1000	5A0125	R/L1, S/L2, T/L3	—	—	—	—
		U/T1, V/T2, W/T3	—	—	—	—
		-, +1, +2	—	—	—	—
		B1, B2	—	—	—	—
		⏚	—	—	—	—
G5	5090	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M10	—	80 to 150 (3/0 to 300)	—
		⏚	Pressure Lug	—	22 to 60 (4 to 2/0)	—
		r,	M4	—	2 to 5.5 (14 to 10)	—
A1000	5A0145	R/L1, S/L2, T/L3	—	—	—	—
		U/T1, V/T2, W/T3	—	—	—	—
		-, +1, +2	—	—	—	—
		B1, B2	—	—	—	—
		⏚	—	—	—	—
G5	5110	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M12	—	150 to 200 (300 to 400)	—
		⏚	Pressure Lug	—	22 to 60 (4 to 2/0)	—
		r,	M4	—	2 to 5.5 (14 to 10)	—

Series	Model	Terminal Signal	Terminal Screw	Tightening Torque N · m (lb.in.)	Possible Gauges mm² (AWG/kcmil)	Recommended Gauge mm² (AWG/kcmil)
A1000	5A0192	R/L1, S/L2, T/L3	—	—	—	—
		U/T1, V/T2, W/T3	—	—	—	—
		-, +1, +2	—	—	—	—
		B1, B2	—	—	—	—
		⏚	—	—	—	—
G5	5160	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +3	M4	—	180 to 200 (350 to 400)	—
		⏚	Pressure Lug	—	30 to 60 (3 to 2/0)	—
		r,	M4	—	2 to 5.5 (14 to 10)	—
A1000	5A0242	R/L1, S/L2, T/L3	—	—	—	—
		U/T1, V/T2, W/T3	—	—	—	—
		-, +1, +2	—	—	—	—
		B1, B2	—	—	—	—
		⏚	—	—	—	—

Table 28 Control Circuit Terminal Size and Wire Gauge

Power Supply	Series	Capacity	Terminal Signal	Terminal Screw	Tightening Torque (N · m)	Wire Range AWG (mm²)	Recommended Gauge AWG (mm²)
200 V Class 400 V Class	G5	All capacities	1 to 11, 13 to 33	M3.5	—	Stranded wire: 0.5 to 1.25 Single Line 0.5 to 1.25	—
			12 (G)	M3.5	—	0.5 to 2.0	—
200 V Class 400 V Class	A1000	All capacities	FM, AC, AM, P1, P2, PC, SC, SN, SP, A1, A2, A3, +V, -V, S1, S2, S3, S4, S5, S6,S7, S8, MA, MB, MC, M1-M6	Phoenix type	4.2 to 5.3 (0.5 to 0.6)	Stranded wire: 26 to 16 (0.14 to 1.5)	18 (0.75)
			MP, RP, R+, R-, S+, S-, IG DM+, DM-, H1, H2, HC	Phoenix type	4.2 to 5.3 (0.5 to 0.6)	Stranded wire: 26 to 16 (0.14 to 1.5)	18 (0.75)
			E (G)	M3.5	7.0 to 8.8 (0.8 to 1.0)	20 to 14 (0.5 to 2.0)	12 (1.25)

YASKAWA AC Drive
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Product Transition Guide

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

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