

Procedure for Replacing the V1000 with the GA500

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This document describes the differences to note, and precautions to take, when replacing the V1000 with the GA500. For more information on model replacement, refer to the instruction manual (or technical manual, etc.) for each product.

1. Models to Be Replaced

Old model V1000
Type: CIMR-VA□A□□□□

New model GA500
Catalog code: GA50A□□□□

Replacement Capacity	200 V Class (for three-phase power supply): 0.1 kW to 15 kW	Heavy Duty Rating (HD)
	0.2 kW to 18.5 kW	Normal Duty Rating (ND)
	(for single-phase power supply): 0.1 kW to 3.7 kW	Heavy Duty Rating (HD)
	0.2 kW to 5.5 kW	Normal Duty Rating (ND)
	400 V Class (for three-phase power supply): 0.2 kW to 15 kW	Heavy Duty Rating (HD)
	(for three-phase power supply): 0.4 kW to 18.5 kW	Normal Duty Rating (ND)

The following table shows the matching between the old model (V1000) and replacement model type (GA500) numbers. Differences in specification between the V1000 and the GA500 are highlighted in **bold**.

Table 1: 200 V Class (three-phase)

V1000 Model	Rated Output Current Normal Duty (ND) Rating	Rated Output Current Heavy Duty (HD) Rating	GA500 Catalog code	Rated Output Current Normal Duty (ND) Rating	Rated Output Current Heavy Duty (HD) Rating
CIMR-VA2A0001	1.2 A	0.8 A	GA50A2001	1.2 A	0.8 A
CIMR-VA2A0002	1.9 A	1.6 A	GA50A2002	1.9 A	1.6 A
CIMR-VA2A0004	3.5 A	3.0 A	GA50A2004	3.5 A	3.0 A
CIMR-VA2A0006	6.0 A	5.0 A	GA50A2006	6.0 A	5.0 A
CIMR-VA2A0008	8.0 A	6.9 A	GA50A2008	8.0 A	6.9 A
CIMR-VA2A0010	9.6 A	8.0 A	GA50A2010	9.6 A	8.0 A
CIMR-VA2A0012	12.0 A	11.0 A	GA50A2012	12.2 A	11.0 A
CIMR-VA2A0018	17.5 A	14.0 A	GA50A2018	17.5 A	14.0 A
CIMR-VA2A0020	21.0 A	17.6 A	GA50A2021	21.0 A	17.6 A
CIMR-VA2A0030	30.0 A	25.0 A	GA50A2030	30.0 A	25.0 A
CIMR-VA2A0040	40.0 A	33.0 A	GA50A2042	42.0 A	33.0 A
CIMR-VA2A0056	56.0 A	47.0 A	GA50A2056	56.0 A	47.0 A
CIMR-VA2A0069	69.0 A	60.0 A	GA50A2070	70.0 A	60.0 A
			GA50A2082	82.0 A	75.0 A

Table 2: 200 V Class (single-phase)



V1000 Model	Rated Output Current Normal Duty (ND) Rating	Rated Output Current Heavy Duty (HD) Rating	GA500 Catalog code	Rated Output Current Normal Duty (ND) Rating	Rated Output Current Heavy Duty (HD) Rating
CIMR-VABA0001	1.2 A	0.8 A	GA50AB001	1.2 A	0.8 A
CIMR-VABA0002	1.9 A	1.6 A	GA50AB002	1.9 A	1.6 A
CIMR-VABA0004	3.3 A	3.0 A	GA50AB004	3.5 A	3.0 A
CIMR-VABA0006	6.0 A	5.0 A	GA50AB006	6.0 A	5.0 A
CIMR-VABA0010	9.6 A	8.0 A	GA50AB010	9.6 A	8.0 A
CIMR-VABA0012	12.0 A	11.0 A	GA50AB012	12.2 A	11.0 A
CIMR-VABA0018		17.5 A	GA50AB018		17.6 A

Table 3: 400 V Class (three-phase)

V1000 Model	Rated Output Current Normal Duty (ND) Rating	Rated Output Current Heavy Duty (HD) Rating	GA500 Catalog code	Rated Output Current Normal Duty (ND) Rating	Rated Output Current Heavy Duty (HD) Rating
CIMR-VA4A0001	1.2 A	1.2 A	GA50A4001	1.2 A	1.2 A
CIMR-VA4A0002	2.1 A	1.8 A	GA50A4002	2.1 A	1.8 A
CIMR-VA4A0004	4.1 A	3.4 A	GA50A4004	4.1 A	3.4 A
CIMR-VA4A0005	5.4 A	4.8 A	GA50A4005	5.4 A	4.8 A
CIMR-VA4A0007	6.9 A	5.5 A	GA50A4007	7.1 A	5.6 A
CIMR-VA4A0009	8.8 A	7.2 A	GA50A4009	8.9 A	7.3 A
CIMR-VA4A0011	11.1 A	9.2 A	GA50A4012	11.9 A	9.2 A
CIMR-VA4A0018	17.5 A	14.8 A	GA50A4018	17.5 A	14.8 A
CIMR-VA4A0023	23.0 A	18.0 A	GA50A4023	23.4 A	18.0 A
CIMR-VA4A0031	31.0 A	24.0 A	GA50A4031	31.0 A	24.0 A
CIMR-VA4A0038	38.0 A	31.0 A	GA50A4038	38.0 A	31.0 A
			GA50A4044	44.0 A	39.0 A
			GA50A4060	60.0 A	45.0 A

Note: The GA500 has a lower overload tolerance when used at the ND rating.

V1000: 120% of the rated output current for 60 seconds

GA500: 110% of the rated output current for 60 seconds

2. Preliminary Check Sheet for Use When Considering Updating the Drive Model

Table 4: Preliminary Check Sheet for Use When Considering Updating the Drive Model

Classification	Item	Check Points	Checked
Hardware	Control unit	[Drive installation position] The GA500 is different in mounting hole size from conventional drives but can be installed with M4 screws similarly to the V1000. Only the UL Type 1 (enclosed wall-mounted type) is different in H dimension from conventional drives. You should confirm the installation space. For the dimensions of your current drive, see Section 4 of this document.	
		[Keypad (operator) installation position] * Keypad (operator) that comes with the drive Different in dimensions and installation position from conventional drives If there is a display panel cut-out on the control panel, you should change the panel cut-out dimensions and the installation position of the drive. * Remote control keypad (operator) Since the remote control keypad for the GA500 is not compatible with conventional ones (including the V1000 remote control operator), you should purchase the new one and change the panel cut-out dimensions. Since the attachment for installing the keypad on the control panel is also not compatible with conventional ones (including the V1000's attachment for installing the operator on the control), you should purchase the new one.	
		[Special specs] Check the delivery specifications to confirm that your current drive does not have any customized spec such as NP, special shaping, or special processing.	
	Main circuit	[Main circuit lines (including earth wires as well)] The GA500 is different in the main circuit terminal block position and arrangement sequence than conventional drives. If the main circuit wiring has no room to accommodate additional wires, consider replacing the entire wiring or extend the wiring.	
		[Main circuit terminal block specs] The GA500 uses European terminals as the main circuit terminals and thus does not allow the connection of wires with closed-loop crimp terminals. You should remove the crimped portions and bare wires again. The GA500 is different in terminal shape and size than conventional drives. For the details of the terminals used in your current drive, see Section 3-1 of this document.	
	Control Circuit	[Control circuit lines] The GA500 is different in the control circuit terminal block position and arrangement sequence than conventional drives. If the control circuit wiring has no room to accommodate additional wires, consider replacing the entire wiring or extend the wiring.	
		[Control circuit terminal block specs] The GA500 is different in terminal quantity, shape, and size than conventional drives. For the details of the terminals used in your current drive, see Section 3-2 of this document.	
Software	Software	[Presence of customized software] Check that the software version of your current drive is that of Yaskawa standard software. If whether or not it is standard software is unknown, contact Yaskawa to tell the software version of your current drive.	

Classification	Item	Check Points	Checked
	Parameter	<p><u>[Parameter settings]</u> The GA500 may be different in parameter sequence, etc. than conventional drives. Identify the parameters of your current drive and then configure the parameters in accordance with Section 5 of this document. For parameters not documented in this document, contact Yaskawa. The support tool for the GA500, "DriveWizard", provides the "drive replacement" function that automatically converts parameters from conventional products. (Under development) "DriveWizard" is different from the former tool, "DriveWizard Plus".</p>	
Option	Option Card	<p><u>[Presence of option cards]</u> Option cards available with the GA500 are compatible with conventional ones. However, you should purchase the option card cases only.</p>	
Others	Peripheral device	<p><u>[Presence of braking resistor]</u> Check whether or not a braking resistor is used in your current drive. Note the following points: (1) The cable of a braking resistor (ERF type) available with the V1000 may become short for termination reasons when you use the braking resistor with the GA500. Use an equivalent cable if you need a longer cable. In this case, securely insulate the extended portion.</p>	
		<p><u>[Presence of braking unit]</u> You can use the braking unit currently in use without modification.</p>	
		<p><u>[Presence of AC and DC reactors]</u> You can use the AC or DC reactor currently in use without modification.</p>	
		<p><u>[Presence of noise filter]</u> You can use the noise filter currently in use without modification.</p>	
		<p><u>[Presence of fuse]</u> You can use the fuse currently in use without modification.</p>	
		<p><u>[Remote control keypad]</u> While the remote control keypad for the V1000 was available as an option, the GA500 comes with an operator you can remove from the drive and use for remote control.</p>	

Note:

- For more information on model replacement, double-check the instruction manual (or technical manual, etc.) for each product.
- For information on how to order catalogs and instruction manuals, etc. and the detailed information on pricing, delivery time, etc., contact Yaskawa sales representative.
- If you have technical questions, consult with Yaskawa Contact Center (available via the toll-free phone number: 0120-502-495).

3. Terminal Matching Table

Carefully note that some terminals are different in size and shape between the V1000 and GA500. (See Section 3-4.)

Also, all the GA500 model types use European terminals not only in the control circuit but also in the main circuit.

Table 5: Main Circuit Terminal Matching Table

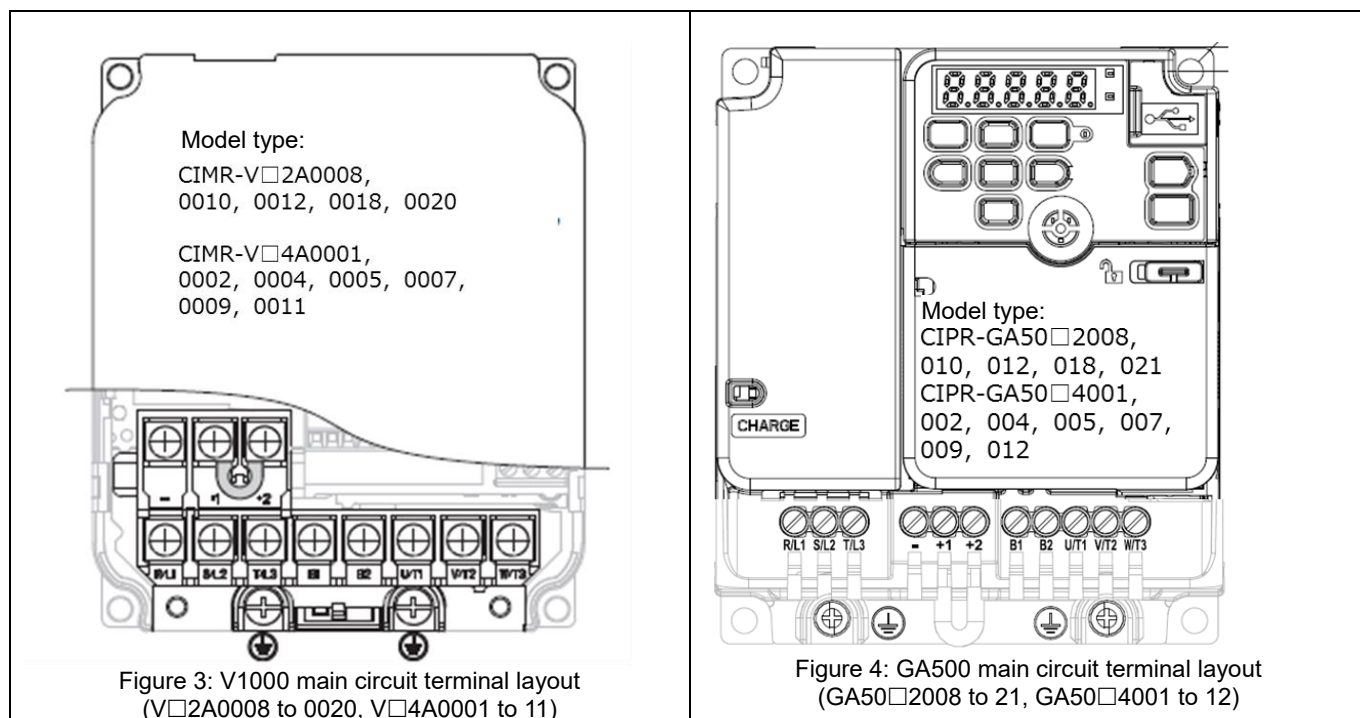
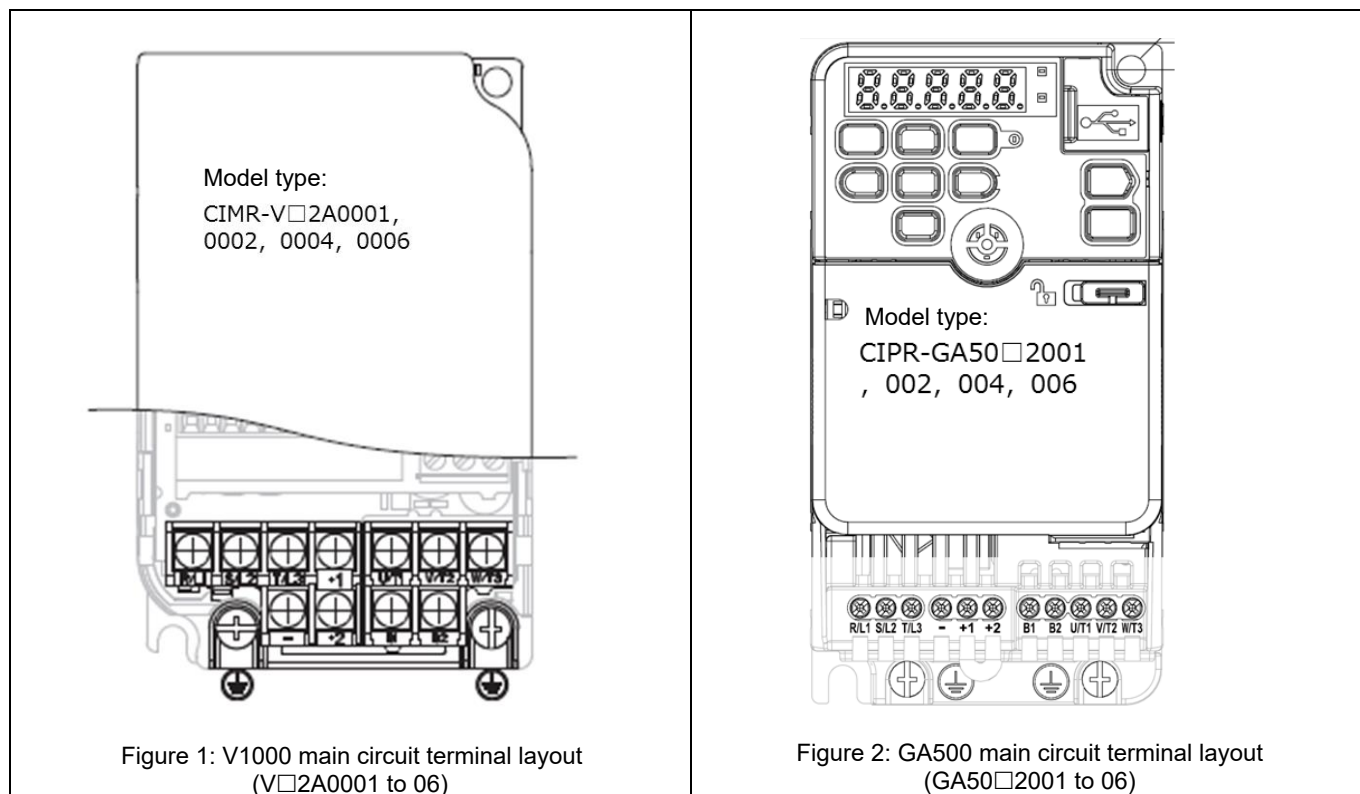
Table 6: Main Circuit Terminal Matching Table

Main Circuit Terminals			Notes
V1000	GA500		
V□2A 0001-0069	GA50□ 2001-2089	GA50□ B001-B018	
V□4A 0001-0038	GA50□ 4001-4060		
R/L1	R/L1		For main circuit power supply input
S/L2	S/L2		
T/L3	T/L3		
		L	
		N	
U/T1	U/T1	U/T1	For drive output
V/T2	V/T2	V/T2	
W/T3	W/T3	W/T3	
B1	B1	B1	For connecting braking resistor/braking resistor unit
B2	B2	B2	
+1	+1	+1	For DC reactor connection, for direct-current power supply input (positive terminal)
+2	+2		For DC reactor connection
-	-	-	For direct-current power supply input (negative terminal), for braking unit connection (negative terminal)
⏏ (2 pcs)	⏏ (2 pcs)	⏏ (2 pcs)	For grounding: 200 V class, D class grounding (ground to 100 Ω or less) 400 V class: C class grounding (ground to 10 Ω or less)

* The single-phase 200V-class GA500 model types are not equipped with the DC reactor connection terminals (+2).

3-1. Main Circuit Terminals

The GA500 terminals are different from the V1000 terminals in shape but not in function.



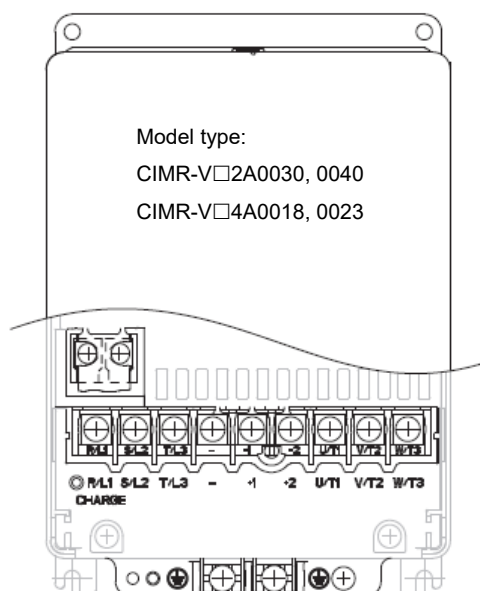


Figure 5: V1000 main circuit terminal layout
(V□2A0030 or 40, V□4A0018 or 23)

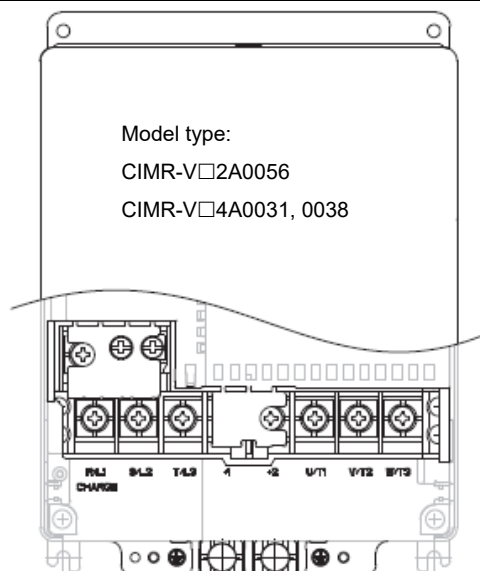


Figure 6: V1000 main circuit terminal layout
(V□2A0056, V□4A0031 or 38)

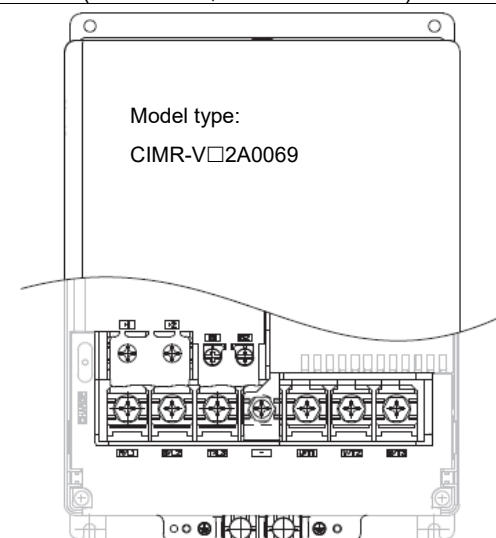


Figure 7: V1000 main circuit terminal layout (V□2A0069)

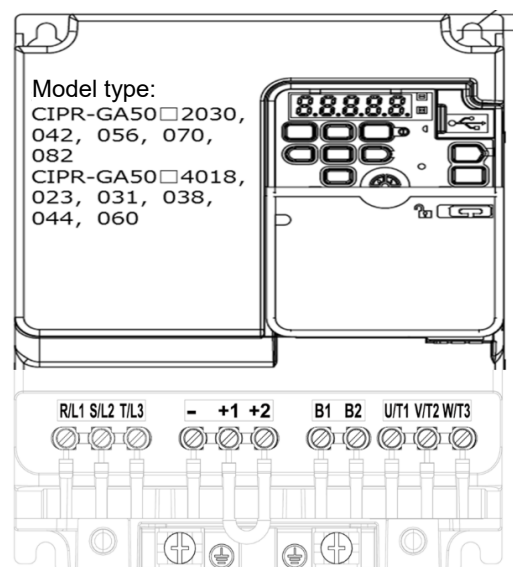


Figure 8: GA500 main circuit terminal layout
(GA50□2030 to 82, GA50□4018 to 60)

Model type:
CIMR-V□BA0001,
0002, 0003

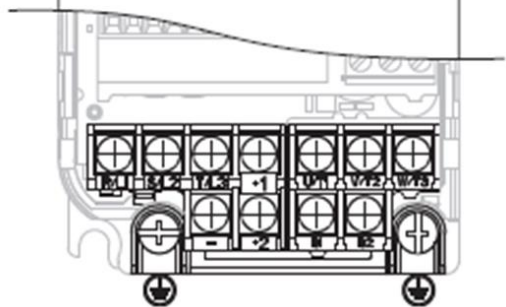


Figure 9: V1000 main circuit terminal layout (single-phase)
(V□BA0001 to 03)

Model type:
CIPR-GA50□B001,
002, 004

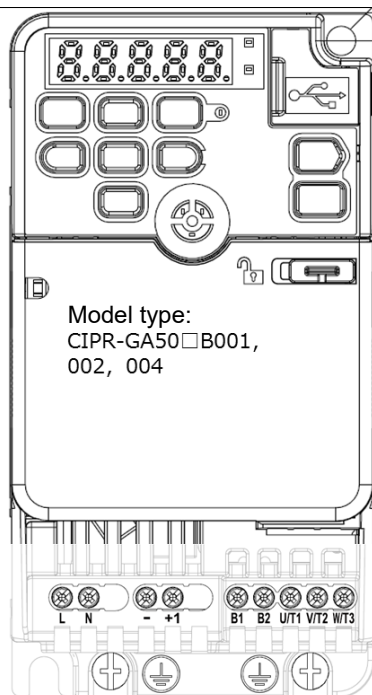


Figure 10: GA500 main circuit terminal layout (single-phase)
(GA50□B001 to 004)

Model type:
CIMR-V□BA0006, 0010, 0012

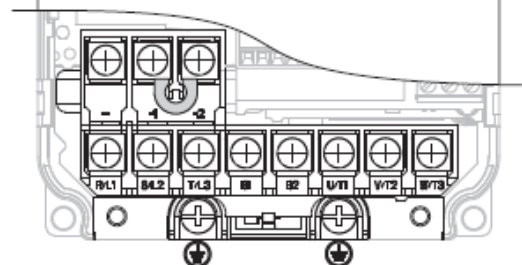


Figure 11: V1000 main circuit terminal layout (single-phase)
(V□BA0006 to 12)

Model type:
CIMR-V□BA0018



Figure 12: V1000 main circuit terminal layout (single-phase)
(V□BA0018)

Model type:
CIPR-GA50□B006,
010, 012, 018

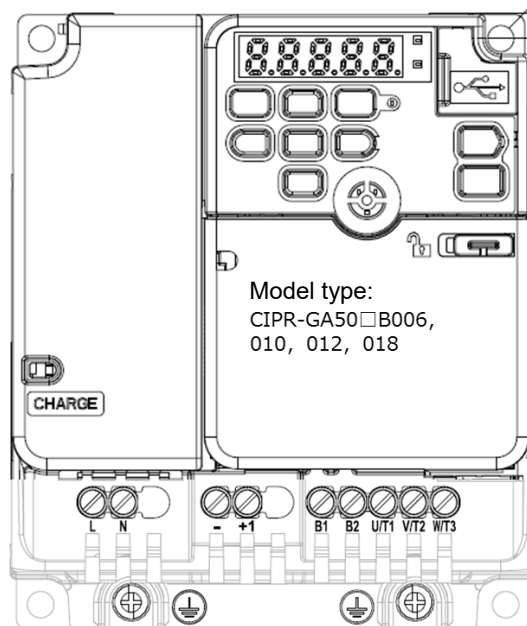


Figure 13: GA500 main circuit terminal layout (single-phase)
(GA50□B006 to 18)

3-2. Control Circuit Terminals and Signal Levels

For both the V1000 and GA500, the functions shown are factory defaults.
Differences in specification between the V1000 and the GA500 are highlighted in **bold**.

Table 6: Control Circuit Terminal Matching Table

Analog Input		Name	Signal Level	
V1000	GA500		V1000	GA500
S1	S1	MFDI selection 1 (ON: Forward run, OFF: Stop)	Photocoupler isolation 24 VDC, 8 mA	Photocoupler isolation 24 VDC, 6 mA
S2	S2	MFDI selection 2 (ON: Reverse run, OFF: Stop)		
S3	S3	MFDI selection 3 (External fault (N.O.))		
S4	S4	MFDI selection 4 (Fault reset)		
S5	S5	MFDI selection 5 (Multi-step speed reference 1)		
S6	S6	MFDI selection 6 (Multi-step speed reference 2)		
S7	S7	MFDI selection 7 (Jog command)		
	SN	MFDI power supply 0 V	Sequence common *2	MFDI power supply, 24 V (maximum 150 mA) *3
SC *1	SC	MFDI selection common		
	SP	MFDI power supply +24 Vdc		
RP	RP	Master frequency reference pulse train input	<ul style="list-style-type: none"> • Response frequency: 0.5 to 32kHz • H level duty: 30% to 70% • H level voltage: 3.5 V to 13.2 V • L level voltage: 0.0 V to 0.8 V • Input impedance: 3kΩ 	<ul style="list-style-type: none"> • Response frequency: 0 to 32kHz • H level duty: 30% to 70% • H level voltage: 3.5 V to 13.2 V • L level voltage: 0.0 V to 0.8 V • Input impedance: 3kΩ
+V	+V	Power supply for frequency setting	+10.5 V (allowable current 20 mA maximum)	
A1	A1	MFAI1	<ul style="list-style-type: none"> • Voltage input: DC0 to +10 V (20kΩ) • Resolution: 1/1000 	<ul style="list-style-type: none"> • Voltage input: DC0 to +10 V (20kΩ) • Resolution: 1/4096
A2	A2	MFAI2	<ul style="list-style-type: none"> • 0 V to 10 V/100% (input impedance: 20 kΩ), resolution: 1/1000 • 4 mA to 20 mA/100%, 0 mA to 20 mA (input impedance: 250 Ω), resolution: 1/500 	<ul style="list-style-type: none"> • 0 V to 10 V/100% (input impedance: 20 kΩ), resolution: 1/4096 • 4 mA to 20 mA/100%, 0 mA to 20 mA (input impedance: 250 Ω), resolution: 1/2048
AC	AC	Frequency reference common	0V	
E(G)	E(G)	Cable sheath For option card earth wire connection	-	

Analog Input		Name	Signal Level	
V1000	GA500		V1000	GA500
H1	H1	Safe Disable input 1	<ul style="list-style-type: none">• 24 VDC, 10 mA maximum• ON (closed): Normal operation• OFF (open): Coasting• Internal impedance 3.3 kΩ• Minimum OFF width: 1ms or less <div>*5</div> <div>*6</div>	<ul style="list-style-type: none">• 24 VDC, 6 mA maximum• ON (closed): Normal operation• OFF (open): Coasting• Internal impedance: 4.7kΩ• Minimum OFF width: 3ms or less <div>*7</div>
	H2	Safe Disable input 2		
HC	HC	<ul style="list-style-type: none">• Safe Disable function common• Safe command common	Safe Disable function common Note: Do not short-circuit the terminals HC and SN	
MA	MA	N.O. output (error)	<ul style="list-style-type: none">• Relay output• 30 VDC 10 mA to 1 A• 250 VAC 10 mA to 1 A	
MB	MB	N.C. output (error)		
MC	MC	Digital output common		
P1	P1	Multi-function PHC output 1 Note: Factory default function	<ul style="list-style-type: none">• Photocoupler output• 48 V, 50 mA maximum <div>*9</div>	<ul style="list-style-type: none">• Photocoupler output• 48 V, 2 mA to 50 mA <div>*9</div>
<div></div>	C1 <div>*8</div>	V1000: During Run GA500: During Run		
P2	P2	Multi-function PHC output 2 Note: Factory default function		
<div></div>	C2 <div>*8</div>	V1000: Frequency Agree GA500: Frequency (Speed) Agree		
PC <div>*8</div>	<div></div>	Photocoupler output common		
MP	MP	Pulse Train Output *10	32kHz max.	
AM	AM	Multi-function analog monitor 1 *11	<ul style="list-style-type: none">• 0 to +10 V• 2 mA maximum	<ul style="list-style-type: none">• 0 to +10 V/0% to 100%• 4 to 20 mA (receive-side recommended impedance: 250Ω) <div>*12</div>
AC	AC	Monitor common	0 V	
<div></div>	PS	External 24 V power supply input	Supplies backup power to the drive control circuit, keypad, and option board. 21.6 VDC to 26.4 VDC, 700 mA	

*1: When replacing the wiring to SC terminal of the V1000 with that of the GA500, see the connection diagram in Table 7.

*2: Factory default = Sinking Mode: SC

*3: Factory default = Sinking Mode: SN (short-circuit SC-SP)

*4: To select the input method, use DIP switch S1 and H3-09 [Terminal A2 Signal Level Select].

*5: Remove the jumper between H1 and HC to use the Safe Disable input.

*6: Minimum OFF width: Time from the Safe Disable input to the output shut-off.

*7: Remove the jumper between H1-HC and H2-HC to use the Safe Disable input.

*8: The wiring to the V1000 PC terminal should be connected to the GA500 C1 or C2 terminal.

*9: Connect a flywheel diode when driving a reactive load such as a relay coil. Make sure that the flywheel diode rating is not lower than the circuit voltage.

*10: Factory default = Output frequency

*11: Factory default = Output frequency

*12: Use jumper switch S5 and H4-07 [Terminal AM Signal Level Select] to set the signal type.

Connection at Replacement

Control I/O Connections

◆ Switching sinking mode/sourcing mode

With the V1000, the sink/source jumper on the control board is used to select whether to use the sinking mode or sourcing mode and whether to use the internal or external power supply.

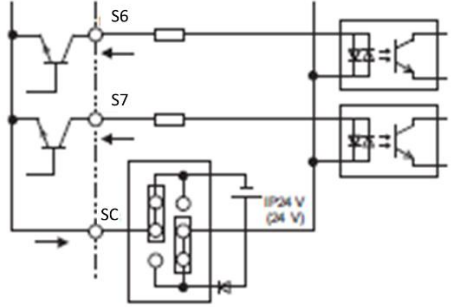
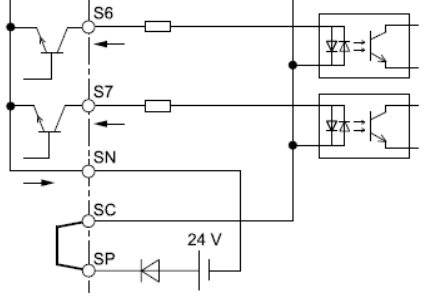
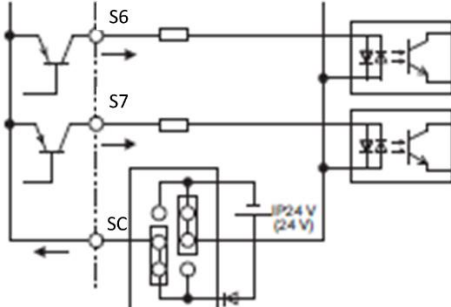
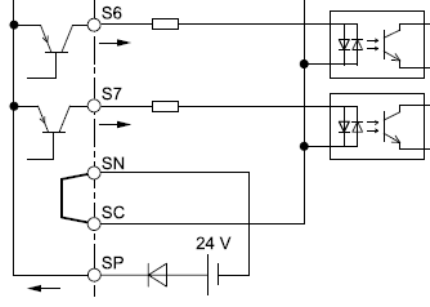
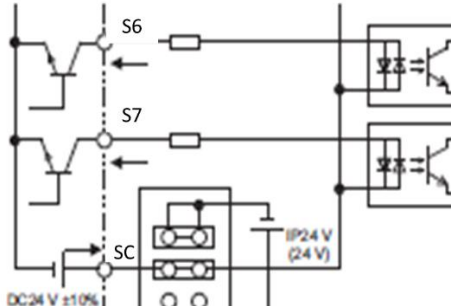
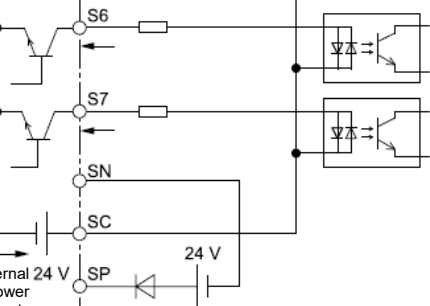
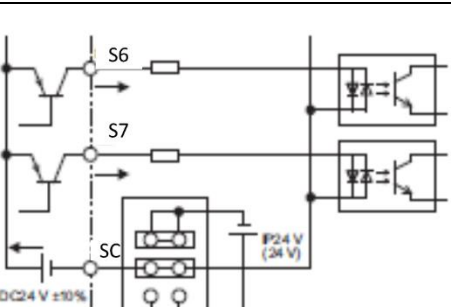
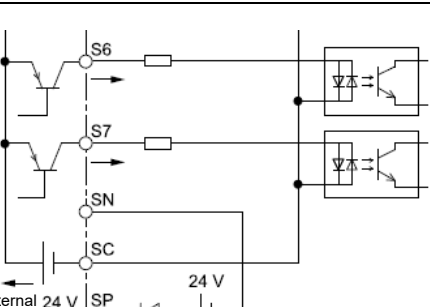
With the GA500, however, these settings depend on how you connect the SN, SC, and SP terminals.

Check the jumper setting on the V1000, and use the corresponding mode/ power supply connection method, instead.

Sinking mode and internal power supply are selected by factory default.

Note: Do not short-circuit the terminals SP and SN.

Table 7: Switching sinking mode/sourcing mode

Mode/Power Supply	V1000	GA500
Sinking mode (NPN) Internal power supply		
Sourcing mode (PNP) Internal power supply		
Sinking mode (NPN) External power supply		
Sourcing mode (PNP) External power supply		

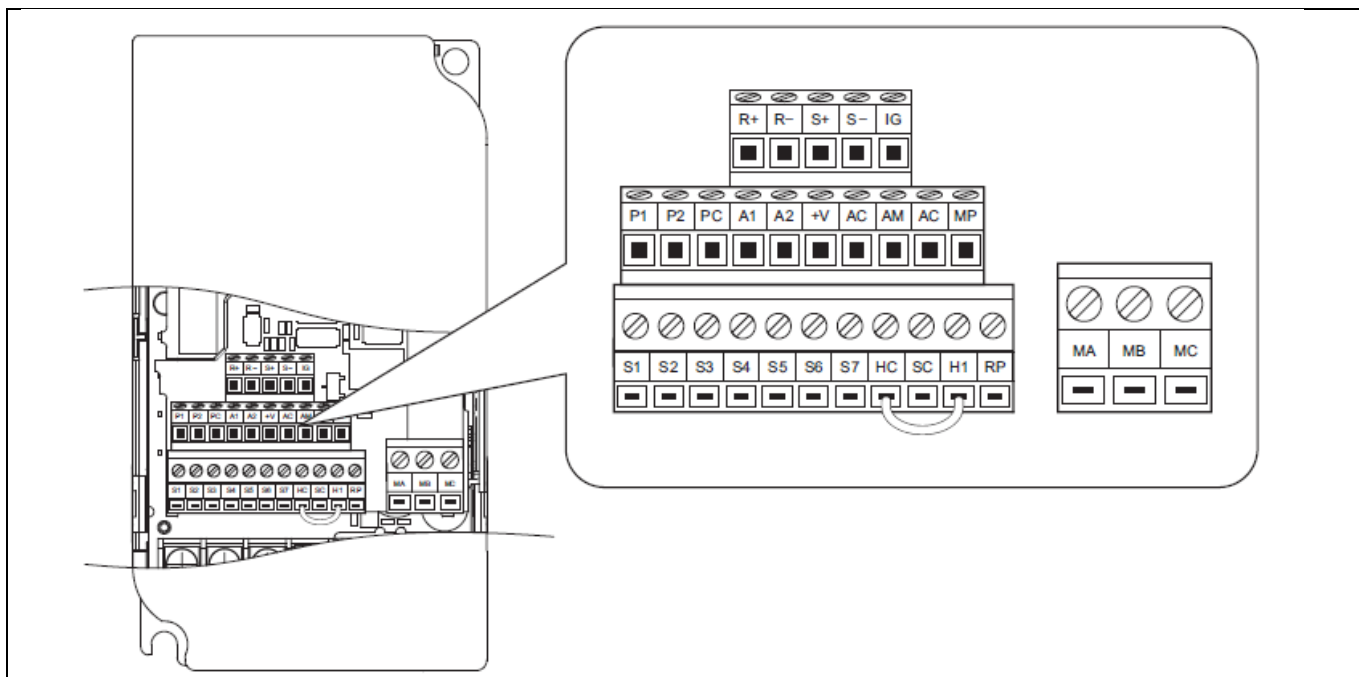


Figure 14: V1000 control circuit terminal layout

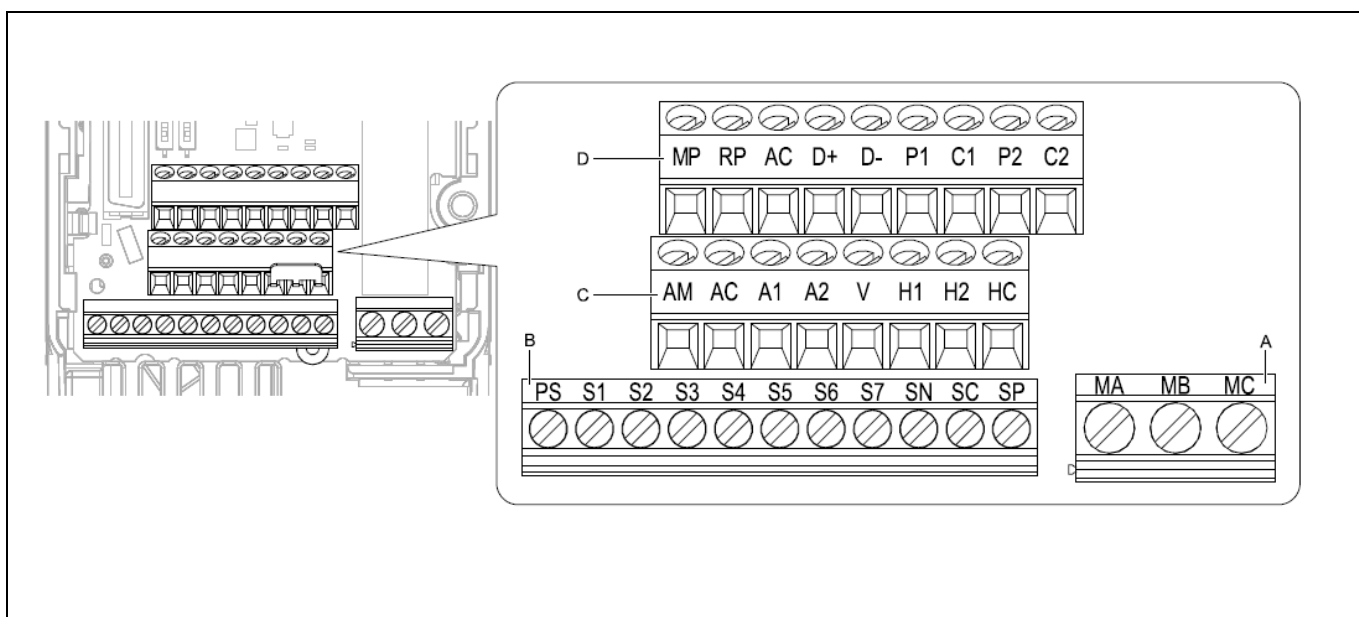


Figure 15: GA500 control circuit terminal layout

3-3. Communication Circuit Terminals

Table 8: Communication circuit terminals

Communication circuit terminal		Name	Signal Level	
V1000	GA500		V1000	GA500
R+	D+	V1000: Communication input (+) GA500: Communication input/output (+)	MEMOBUS/Modbus communications Use an RS-485/422 cable to connect the drive 115.2 kbps (maximum)	For MEMOBUS/Modbus (RTU mode) communications Use an RS-485 cable to connect the drive 115.2 kbps (maximum)
S+		V1000: Communication input (+) GA500: Communication input/output (+)		
R-	D-	V1000: Communication input (-) GA500: Communication input/output (-)		
S-		V1000: Communication input (-) GA500: Communication input/output (-)		
IG	AC	Shield ground	0 V	0 V

Note:

- You can apply the V1000 communication option board to the GA500, provided that you must purchase and assemble the communication option board cover (option). The assembling procedure is described in the instruction manual that comes with the option board cover.
- Set DIP switch S2 to ON to enable the termination resistor in the last drive in a MEMOBUS/Modbus network.

3-4. Differences in Terminal Size, Shape, and Wire Gauge

Main circuit terminal sizes and wire gauges

The wire gauge sizes for the GA500 described here are different from the connectable wire gauge sizes indicated in the instruction manual for the purpose of clarifying the compatibility with the V1000.

* For information on the GA500 recommended wire gauge sizes and the wire gauge sizes compliant with the European standards and the UL standards, refer to the GA500 Technical Manual.

Table 9: Icons representing the screw head shapes















Icon	Screw head shape
	+/-
	Slotted head (-)
	Hexagon socket head (width across flats: 5)

Table 10: Differences in main circuit terminal size and wire gauge for 200 V class

Note:  shows an earthing terminal

Model	Drive capacity V1000: Type GA500: Type	Terminal	Connectable wire gauge size: mm ²	Terminal Screw		Tightening torque: N·m (lbf·in)		
				Size	Shape			
V1000	2A0001 2A0002 2A0004 2A0006	R/L1, S/L2, T/L3	0.75-2	M3.5		0.8-1.0 (7.1-8.9)		
		U/T1, V/T2, W/T3						
		-, +1, +2						
		B1, B2						
		≡						
GA500	2001 2002 2004 2006	R/L1, S/L2, T/L3	2	M3		0.5-0.6 (4.4-5.3)		
		U/T1, V/T2, W/T3						
		-, +1, +2	Note: Change the wiring when replacing from V1000.	M3.5		0.8-1.0 (7.1-8.9)		
		B1, B2						
		≡						
V1000	2A0008 2A0010 2A0012 2A0018 2A0020	R/L1, S/L2, T/L3	2-5.5	M4		1.2 to 1.5 (10.6-13.3)		
		U/T1, V/T2, W/T3						
		-, +1, +2						
		B1, B2						
		≡						
GA500	2008 2010 2012	R/L1, S/L2, T/L3	2-5.5	M3		0.5-0.6 (4.4-5.3)		
		U/T1, V/T2, W/T3						
		-, +1, +2					1.2 to 1.5 (10.6-13.3)	
		B1, B2						
		≡						
	2018	R/L1, S/L2, T/L3	2-5.5	M4		1.5-1.7 (13.5-15)		
		U/T1, V/T2, W/T3	2-8					
		-, +1, +2	2-5.5					1.2 to 1.5 (10.6-13.3)
		B1, B2						
		≡						
	2021	R/L1, S/L2, T/L3	2-8	M4		1.5-1.7 (13.5-15)		
		U/T1, V/T2, W/T3	2-5.5					
		-, +1, +2	2-8					
		B1, B2	2-5.5					1.2-1.5 (10.6-13.3)
		≡						
V1000	2030	R/L1, S/L2, T/L3	5.5-14	M4		2.1-2.3 (18.6-20.4)		
		U/T1, V/T2, W/T3						
		-, +1, +2	2-5.5	M5		2.0-2.5 (17.7-22.1)		
		B1, B2						
		≡						























Model	Drive capacity V1000: Type GA500: Type	Terminal	Connectable wire gauge size: mm ²	Terminal Screw		Tightening torque: N·m (lbf·in)
				Size	Shape	
GA500	2030	R/L1, S/L2, T/L3	5.5-14	M4		1.5-1.7 (13.5-15)
		U/T1, V/T2, W/T3				
		-, +1, +2				
		B1, B2	2-5.5			2.0-2.5 (17.7-22.1)
		≡	5.5-14			
V1000	2A0040	R/L1, S/L2, T/L3	5.5-14	M4		2.1-2.3 (18.6-20.4)
		U/T1, V/T2, W/T3				
		-, +1, +2				
		B1, B2	2-5.5	M5		2.0-2.5 (17.7-22.1)
		≡	5.5-14			
GA500	2042	R/L1,S/L2,T/L3, U/T1, V/T2, W/T3	3.5 - 14	M4		1.5-1.7 (13.5-15)
		-, +1, +2				5.5-30
		B1, B2	2-8	M4		1.5-1.7 (13.5-15)
		≡	5.5-14	M5		2.0-2.5 (17.7-22.1)
		V1000	2A0056	R/L1, S/L2, T/L3	14-22	M6
U/T1, V/T2, W/T3						
-, +1, +2						
B1, B2	5.5-14			M5	2.7 to 3.0 (23.9-26.6)	
≡	8-22			M6	5.4 to 6.0 (47.8-53.1)	
GA500	2056	R/L1,S/L2,T/L3, U/T1, V/T2, W/T3	5.5-30	M5		2.3-2.5 (19.8-22)
		U/T1, V/T2, W/T3	5.5-22			
		-, +1, +2	8-30			
		B1, B2	2-14	M4		1.5-1.7 (13.5-15)
		≡	8-22	M6		5.4 to 6.0 (47.8-53.1)
V1000	2A0069	R/L1, S/L2, T/L3	8-38	M8		9.9-11.0 (87.6-97.4)
		U/T1, V/T2, W/T3	14-22			
		-, +1				
		B1, B2	8-14	M5		2.7 to 3.0 (23.9-26.6)
		≡	8-22	M6		5.4 to 6.0 (47.8-53.1)
GA500	2070	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3	8-38	M6		5-5.5 (45-49)
		U/T1, V/T2, W/T3	5.5-30			
		-, +1	14-50			
		B1, B2	5.5-14	M4		1.5-1.7 (13.5-15)
		≡	8-22	M6		5.4 to 6.0 (47.8-53.1)

Table 11. Differences in main circuit terminal size, shape, and wire gauge for 400 V class

Model	Drive capacity V1000: Type GA500: Type	Terminal	Connectable wire gauge size: mm ²	Terminal Screw		Tightening torque: N·m (lbf·in)	
				Size	Shape		
V1000	4A0001 4A0002 4A0004 4A0005 4A0007 4A0009 4A0011	R/L1,S/L2,T/L3	2-5.5	M4		1.2 to 1.5 (10.6-13.3)	
		U/T1,V/T2,W/T3					
		-,+1,+2					
		B1,B2					
		≡					
GA500	4001 4002 4004 4005 4007 4009	R/L1,S/L2,T/L3	2-5.5	M3		0.5-0.6 (4.4-5.3)	
		U/T1,V/T2,W/T3					
		-,+1,+2		M4		1.2-1.5 (10.6-13.3)	
		B1,B2					
		≡					
	4012	R/L1,S/L2,T/L3	2-5.5	M4		1.5-1.7 (13.5-15)	
		U/T1,V/T2,W/T3					
		-,+1,+2					
		B1,B2					
		≡				1.2-1.5 (10.6-13.3)	
V1000	4A0018	R/L1,S/L2,T/L3	2-14	M4		2.1 to 2.3 (18.6-20.4)	
		U/T1,V/T2,W/T3					
		-,+1,+2					
		B1,B2	2-5.5	M5		2.0 to 2.5 (17.7-22.1)	
		≡	2-14				
GA500	4018	R/L1,S/L2,T/L3	2-14	M4		1.5-1.7 (13.5-15)	
		U/T1,V/T2,W/T3					
		-,+1,+2	2-8				
		B1,B2	2-5.5				
		≡	2-14				
V1000	4A0023	R/L1,S/L2,T/L3	3.5-14	M4		2.1 to 2.3 (18.6-20.4)	
		U/T1,V/T2,W/T3					
		-,+1,+2					
		B1,B2	2-5.5	M5		2.0 to 2.5 (17.7-22.1)	
		≡	5.5-14				
GA500	4023	R/L1,S/L2,T/L3	3.5-14	M4		1.5-1.7 (13.5-15)	
		U/T1,V/T2,W/T3					
		-,+1,+2	2-14				
		B1,B2	2-5.5				
		≡	5.5-14	M5		2.0-2.5 (17.7-22.1)	



















Model	Drive capacity V1000: Type GA500: Type	Terminal	Connectable wire gauge size: mm ²	Terminal Screw		Tightening torque: N·m (lbf·in)
				Size	Shape	
				Size	Shape	
V1000	4A0031	R/L1, S/L2, T/L3	5.5-14	M5		3.6-4.0 (31.8-35.4)
		U/T1, V/T2, W/T3				
		-, +1, +2				
		B1, B2	3.5-8			2.7 to 3.0 (23.9-26.6)
		≡	5.5-14	M6		5.4 to 6.0 (47.8-53.1)
GA500	4031	R/L1, S/L2, T/L3	2-14	M4		1.5-1.7 (13.5-15)
		U/T1, V/T2, W/T3				2.3-2.5 (19.8-22)
		-, +1, +2		M5		
		B1, B2	3.5-8	M4	1.5-1.7 (13.5-15)	
		≡	5.5-14	M6		5.4-6.0 (47.8-53.1)
V1000	4A0038	R/L1, S/L2, T/L3	5.5-14	M5		3.6-4.0 (31.8-35.4)
		U/T1, V/T2, W/T3				
		-, +1, +2				
		B1, B2	3.5-8			2.7 to 3.0 (23.9-26.6)
		≡	5.5-14	M6		5.4 to 6.0 (47.8-53.1)
GA500	4038	R/L1, S/L2, T/L3	5.5-14	M4		3.6-4.0 (31.8-35.4)
		U/T1, V/T2, W/T3	3.5-14			
		-, +1, +2	5.5-22	M5		
		B1, B2	3.5-8	M4		2.7-3.0 (23.9-26.6)
		≡	5.5-14	M6		

Table 13. Differences in main circuit terminal size, shape, and wire gauge for single-phase 200 V class

Model	Drive capacity V1000: Type GA500: Type	Terminal	Connectable wire gauge size: mm ²	Terminal Screw		Tightening torque: N·m (lbf·in)
				Size	Shape	
V1000	BA0001 BA0002 BA0003	L	0.75-2	M3.5		0.8-1.0 (7.1-8.9)
		N				
		-, +1				
		B1, B2				
		≡				
GA500	B001 B002 B004	L	0.75-2	M3		0.5-0.6 (4.4-5.3)
		N				
		-, +1				
		B1, B2		M3.5		0.8-1.0 (7.1-8.9)
		≡				
V1000	BA0006 BA0010 BA0012	L	2-5.5	M4		1.2-1.5 (10.6-13.3)
		N				
		-, +1				
		B1, B2				
		≡				
GA500	B006	L	2-5.5	M3		0.5-0.6 (4.4-5.3)
		N				
		-, +1				
		B1, B2		M4		1.2-1.5 (10.6-13.3)
		≡				
	B010	L	2-5.5	M3		0.5-0.6 (4.4-5.3)
		N				
		-, +1				
		B1, B2		M4		1.2-1.5 (10.6-13.3)
		≡				
	B012	L	2-8	M4		1.5-1.7 (13.5-15)
		N	2-5.5			
		-, +1	2-8			
		B1, B2	2-5.5			
		≡				
V1000	BA0018	L	3.5-8	M5		2.3-2.5 (19.8-22)
		N				
		-, +1				
		B1, B2				
		≡				
GA500	B018	L	3.5-14	M4		1.5-1.7 (13.5-15)
		N	2-8			
		-, +1	3.5-14			
		B1, B2	2-8	M6		2.0 to 2.5 (17.7-22.1)
		≡	3.5-8			

Precautions When Replacing the Wiring

Since the GA500 uses European terminal blocks, take the following precautions.

In addition to these precautions, follow the instructions described in the GA500 Instruction Manual (Technical Manual).

- You cannot connect wires with closed-loop crimp terminals. You should remove the crimped portions and bare wires again. The earthing terminals, however, allow the connection of wires with closed-loop crimp terminals.
- The sheathes of the wires you want to connect should be cut in accordance with the bared wire length specified in the Technical Manual.
- Do not use wires whose conductor is bent, crushed or otherwise damaged. Remove the damaged end of the wire before you use it.
- Do not solder the conductor when connecting a twisted wire.
- Do not leave the wire conductor exposed when connecting a twisted wire. Take care not to twist a twisted wire too much.
- To connect a wire to a European terminal block, insert it until it comes into complete contact. The recommended bared wire length is such that if cut in accordance with it, the sheath will be accommodated inside the resin housing.
- Screws should be tightened at the tightening torque specified for each terminal.
- A slotted driver or a hex tool will be necessary to connect a wire to a European terminal block.
- Clamp the wire near the connecting point to prevent force from acting on the connection.
- After connecting the wires to the terminal block, lightly pull on the wires to make sure that they do not come out of the terminals.
- The screws for wiring terminals should be periodically re-tightened.

Control circuit terminal sizes and wire gauges

Table 14: V1000 control circuit terminal sizes and wire gauges

Terminal symbol	Screw size	Tightening torque (N-m)	Stripped wire		When using a crimp ferrule	
			Usable wire mm ² (AWG)	Recommended wire mm ² (AWG)	Usable wire mm ² (AWG)	Recommended wire mm ² (AWG)
S1 ~ S7, SC, RP, +V, A1, A2, AC, HC, H1, P1, P2, PC, MP, AM, AC, S+, S-, R+, R-, IG	M2	0.22 to 0.25	Twisted wire 0.25 to 1.0 (24 to 17) Single wire 0.25 to 1.5 (24 to 16)	0.75 (18)	0.25 to 0.5 (24 to 20)	0.5 (20)
MA, MB, MC	M3	0.5 to 0.6	Twisted wire 0.25 to 1.5 (24 to 16) Single wire 0.25 to 1.5 (24 to 16)	0.75 (18)	0.25 to 1.0 (24 to 17)	0.5 (20)

Table 15: GA500 control circuit terminal sizes and wire gauges

Terminal block	Terminal symbol	Screw size	Tightening torque N-m (lb., in)	Stripped wire		When using a crimp ferrule	
				Recommended wire size mm ² (AWG)	Connectable wire size mm ² (AWG)	Recommended wire size mm ² (AWG)	Connectable wire size mm ² (AWG)
TB1-1	PS, S1 - S7, SN, SC, SP	M2	0.22 - 0.25 (1.95 - 2.21)	0.75 (18)	<ul style="list-style-type: none"> Twisted wire 0.25 to 1.0 (24 to 17) Single wire 0.25 to 1.5 (24 to 16) 	0.5 (20)	0.25 - 0.5 (24 - 20)
TB1-2	AM, AC, A1, A2, +V, H1, H2, HC						
TB1-3	MP, RP, AC, D+, D-, P1, C1, P2, C2						
TB2	MA, MB, MC	M3	0.5 - 0.6 (4.4 - 5.3)	0.75 (18)	<ul style="list-style-type: none"> Twisted wire 0.25 to 1.0 (24 to 16) Single wire 0.25 to 1.5 (24 to 16) 	0.5 (20)	0.25 - 1.0 (24 - 17)

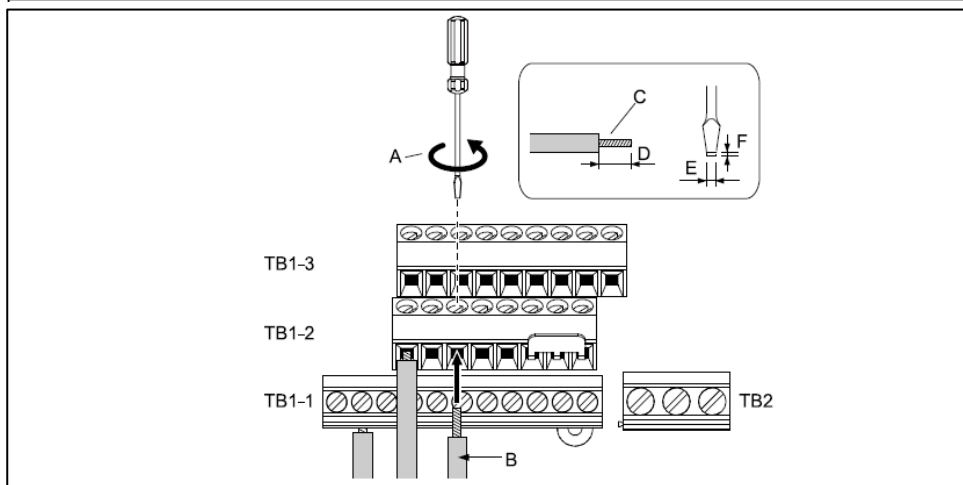


Figure 16: Control circuit wiring procedure

■ Wiring procedure

A - Loosen the screw to open the slot.

B - Insert a wire with a crimp ferrule attached or an unsoldered wire with the core wires lightly twisted.

■ Processing wire ends

C - Pull back the shielding and lightly twist the end with your fingers to keep the ends from fraying.

D - Remove approximately 5.5 mm (0.21 in) of the shielding at the end of the wire if you do not use crimp ferrules.

■ Screwdriver size

E - Blade width of 2.5 mm (0.1 in) or less

F - Blade thickness of 0.4 mm (0.01 in) or less

4. Mounting Dimensions and Peripheral Devices

4-1. External Dimensions and Mounting Dimensions

The GA500 standard specifications are IP20-certified.

Install the optional UL Type 1 kit to change the GA500 enclosure type to UL TYPE 1.

Note: The GA500 mounting hole size is larger than the V1000 but the screws for installing the V1000 can be used to install the GA500.

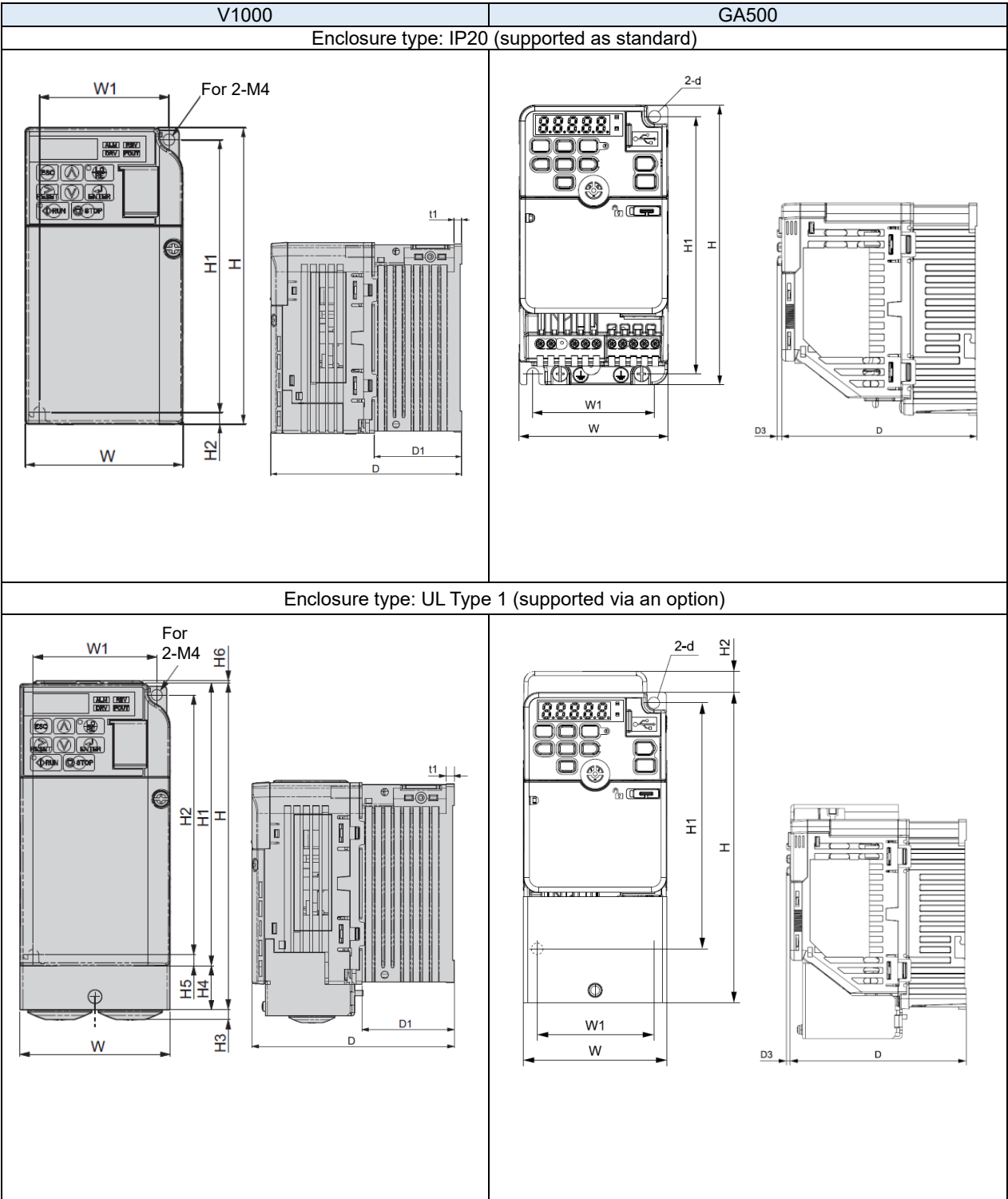


Figure 17: External and mounting dimensions for the V1000 and GA500

For information on the external and mounting dimensions, see Table 16.

This table refers to the V1000 model types and the nine-digit numbers of the GA500 catalog codes.

Differences in specification between the V1000 and the GA500 are highlighted in **bold**.

Table 16: Enclosure type IP20

Voltage Class	External Dimensions [mm]											
	V1000						GA500					
	Model	W	H	D	W1	H1	Model	W	H	D	W1	H1
Single-phase 200 V class	CIMR-VABA0001	68.0	128.0	76.0	56.0	118.0	GA50AB001	68.0	128.0	76.0	56.0	118.0
	CIMR-VABA0002	68.0	128.0	76.0	56.0	118.0	GA50AB002	68.0	128.0	76.0	56.0	118.0
	CIMR-VABA0004	68.0	128.0	118.0	56.0	118.0	GA50AB004	68.0	128.0	118.0	56.0	118.0
	CIMR-VABA0006	108.0	128.0	137.5	96.0	118.0	GA50AB006	108.0	128.0	137.5	96.0	118.0
	CIMR-VABA0010	108.0	128.0	154.0	96.0	118.0	GA50AB010	108.0	128.0	154.0	96.0	118.0
	CIMR-VABA0012	140.0	128.0	163.0	128.0	118.0	GA50AB012	140.0	128.0	163.0	128.0	118.0
	CIMR-VABA0018	170.0	128.0	180.0	158.0	118.0	GA50AB018	170.0	128.0	180.0	158.0	118.0
Three-phase 200 V class	CIMR-VA2A0001	68.0	128.0	76.0	56.0	118.0	GA50A2001	68.0	128.0	76.0	56.0	118.0
	CIMR-VA2A0002	68.0	128.0	76.0	56.0	118.0	GA50A2002	68.0	128.0	76.0	56.0	118.0
	CIMR-VA2A0004	68.0	128.0	108.0	56.0	118.0	GA50A2004	68.0	128.0	108.0	56.0	118.0
	CIMR-VA2A0006	68.0	128.0	128.0	56.0	118.0	GA50A2006	68.0	128.0	128.0	56.0	118.0
	CIMR-VA2A0008	108.0	128.0	129.0	96.0	118.0	GA50A2008	108.0	128.0	129.0	96.0	118.0
	CIMR-VA2A0010	108.0	128.0	129.0	96.0	118.0	GA50A2010	108.0	128.0	129.0	96.0	118.0
	CIMR-VA2A0012	108.0	128.0	137.5	96.0	118.0	GA50A2012	108.0	128.0	137.5	96.0	118.0
	CIMR-VA2A0018	140.0	128.0	143.0	128.0	118.0	GA50A2018	140.0	128.0	143.0	128.0	118.0
	CIMR-VA2A0020	140.0	128.0	143.0	128.0	118.0	GA50A2021	140.0	128.0	143.0	128.0	118.0
	CIMR-VA2A0030	140.0	260.0	140.0	122.0	248.0	GA50A2030	140.0	260.0	140.0	122.0	248.0
	CIMR-VA2A0040	140.0	260.0	140.0	122.0	248.0	GA50A2042	140.0	260.0	140.0	122.0	248.0
	CIMR-VA2A0056	180.0	300.0	163.0	160.0	284.0	GA50A2056	180.0	300.0	143.0	160.0	284.0
	CIMR-VA2A0069	220.0	350.0	187.0	192.0	336.0	GA50A2070	220.0	350.0	187.0	192.0	336.0
							GA50A2082	220.0	350.0	187.0	192.0	336.0
Three-phase 400 V class	CIMR-VA4A0001	108.0	128.0	81.0	96.0	118.0	GA50A4001	108.0	128.0	81.0	96.0	118.0
	CIMR-VA4A0002	108.0	128.0	99.0	96.0	118.0	GA50A4002	108.0	128.0	99.0	96.0	118.0
	CIMR-VA4A0004	108.0	128.0	137.5	96.0	118.0	GA50A4004	108.0	128.0	137.5	96.0	118.0
	CIMR-VA4A0005	108.0	128.0	154.0	96.0	118.0	GA50A4005	108.0	128.0	154.0	96.0	118.0
	CIMR-VA4A0007	108.0	128.0	154.0	96.0	118.0	GA50A4007	108.0	128.0	154.0	96.0	118.0
	CIMR-VA4A0009	108.0	128.0	154.0	96.0	118.0	GA50A4009	108.0	128.0	154.0	96.0	118.0
	CIMR-VA4A0011	140.0	128.0	143.0	128.0	118.0	GA50A4012	140.0	128.0	143.0	128.0	118.0
	CIMR-VA4A0018	140.0	260.0	140.0	122.0	248.0	GA50A4018	140.0	260.0	140.0	122.0	248.0
	CIMR-VA4A0023	140.0	260.0	140.0	122.0	248.0	GA50A4023	140.0	260.0	140.0	122.0	248.0
	CIMR-VA4A0031	180.0	300.0	143.0	160.0	284.0	GA50A4031	180.0	300.0	143.0	160.0	284.0
	CIMR-VA4A0038	180.0	300.0	163.0	160.0	284.0	GA50A4038	180.0	300.0	143.0	160.0	284.0
							GA50A4044	190.0	350.0	204.0	160.0	336.0
							GA50A4060	190.0	350.0	204.0	160.0	336.0

Table 18: Enclosure type UL Type 1

Voltage Class	Exterior Dimensions (mm)													
	V1000							GA500						
	Model	W	H	D	W1	H1	H2	Model	W	H	D	W1	H1	H2
Single-phase 200 V class	CIMR-VABA0001	68.0	148.0	76.0	56.0	118.0	1.5	GA50AB001	68.0	148.0	76.0	56.0	118.0	10.0
	CIMR-VABA0002	68.0	148.0	76.0	56.0	118.0	1.5	GA50AB002	68.0	148.0	76.0	56.0	118.0	10.0
	CIMR-VABA0004	68.0	148.0	118.0	56.0	118.0	1.5	GA50AB004	68.0	148.0	118.0	56.0	118.0	10.0
	CIMR-VABA0006	108.0	149.0	138.0	96.0	118.0	1.5	GA50AB006	108.0	178.0	137.5	96.0	118.0	10.0
	CIMR-VABA0010	108.0	149.0	154.0	96.0	118.0	1.5	GA50AB010	108.0	178.0	154.0	96.0	118.0	10.0
	CIMR-VABA0012	140.0	149.0	163.0	128.0	118.0	5.0	GA50AB012	140.0	178.0	163.0	128.0	118.0	10.0
	CIMR-VABA0018	170.0	166.0	180.0	158.0	118.0	1.5	GA50AB018	170.0	182.0	180.0	158.0	118.0	1.5
Three-phase 200 V class	CIMR-VA2A0001	68.0	148.0	76.0	56.0	118.0	1.5	GA50A2001	68.0	148.0	76.0	56.0	118.0	10.0
	CIMR-VA2A0002	68.0	148.0	76.0	56.0	118.0	1.5	GA50A2002	68.0	148.0	76.0	56.0	118.0	10.0
	CIMR-VA2A0004	68.0	148.0	108.0	56.0	118.0	1.5	GA50A2004	68.0	148.0	108.0	56.0	118.0	10.0
	CIMR-VA2A0006	68.0	148.0	128.0	56.0	118.0	1.5	GA50A2006	68.0	148.0	128.0	56.0	118.0	10.0
	CIMR-VA2A0008	108.0	149.0	129.0	96.0	118.0	1.5	GA50A2008	108.0	178.0	129.0	96.0	118.0	10.0
	CIMR-VA2A0010	108.0	149.0	129.0	96.0	118.0	1.5	GA50A2010	108.0	178.0	129.0	96.0	118.0	10.0
	CIMR-VA2A0012	108.0	149.0	138.0	96.0	118.0	1.5	GA50A2012	108.0	178.0	137.5	96.0	118.0	10.0
	CIMR-VA2A0018	140.0	149.0	143.0	128.0	118.0	5.0	GA50A2018	140.0	178.0	143.0	128.0	118.0	10.0
	CIMR-VA2A0020	140.0	149.0	143.0	128.0	118.0	5.0	GA50A2021	140.0	178.0	143.0	128.0	118.0	10.0
	CIMR-VA2A0030	140.0	273.0	140.0	122.0	248.0	1.5	GA50A2030	140.0	298.0	140.0	122.0	248.0	1.5
	CIMR-VA2A0040	140.0	273.0	140.0	122.0	248.0	1.5	GA50A2042	140.0	298.0	140.0	122.0	248.0	1.5
	CIMR-VA2A0056	180.0	315.0	163.0	160.0	284.0	1.5	GA50A2056	180.0	340.0	143.0	160.0	284.0	1.5
	CIMR-VA2A0069	220.0	365.0	187.0	192.0	336.0	1.5	GA50A2070	220.0	403.0	187.0	192.0	336.0	1.5
								GA50A2082	220.0	403.0	187.0	192.0	336.0	1.5
Three-phase 400 V class	CIMR-VA4A0001	108.0	149.0	81.0	96.0	118.0	1.5	GA50A4001	108.0	149.0	81.0	96.0	118.0	10.0
	CIMR-VA4A0002	108.0	149.0	99.0	96.0	118.0	1.5	GA50A4002	108.0	149.0	99.0	96.0	118.0	10.0
	CIMR-VA4A0004	108.0	149.0	138.0	96.0	118.0	1.5	GA50A4004	108.0	149.0	137.5	96.0	118.0	10.0
	CIMR-VA4A0005	108.0	149.0	154.0	96.0	118.0	1.5	GA50A4005	108.0	178.0	154.0	96.0	118.0	10.0
	CIMR-VA4A0007	108.0	149.0	154.0	96.0	118.0	1.5	GA50A4007	108.0	178.0	154.0	96.0	118.0	10.0
	CIMR-VA4A0009	108.0	149.0	154.0	96.0	118.0	1.5	GA50A4009	108.0	178.0	154.0	96.0	118.0	10.0
	CIMR-VA4A0011	140.0	149.0	143.0	128.0	118.0	5.0	GA50A4012	140.0	178.0	143.0	128.0	118.0	10.0
	CIMR-VA4A0018	140.0	273.0	140.0	122.0	248.0	1.5	GA50A4018	140.0	298.0	140.0	122.0	248.0	1.5
	CIMR-VA4A0023	140.0	273.0	140.0	122.0	248.0	1.5	GA50A4023	140.0	298.0	140.0	122.0	248.0	1.5
	CIMR-VA4A0031	180.0	315.0	143.0	160.0	284.0	1.5	GA50A4031	180.0	340.0	143.0	160.0	284.0	1.5
	CIMR-VA4A0038	180.0	315.0	163.0	160.0	284.0	1.5	GA50A4038	180.0	340.0	143.0	160.0	284.0	1.5
								GA50A4044	190.0	403.0	204.0	160.0	336.0	1.5
								GA50A4060	190.0	403.0	204.0	160.0	336.0	1.5

4-2. UL Type 1 Kit

The UL Type 1 kit model numbers are different between the V1000 and GA500.

Table 18 shows the GA500 attachment model numbers.

Table 18: UL Type 1 kit model numbers

Drive model type		Kit type number
GA500	2001–2006, B001, B002	ZBAA-GA50V1–1
	B004	ZBAA-GA50V1–2
	B006, 2012	ZBAA-GA50V2–1
	B010, 4005–4009	ZBAA-GA50V2–2
	2008, 2010	ZBAA-GA50V2–3
	4001, 4002	ZBAA-GA50V2–4
	4004	ZBAA-GA50V2–5
	B012	ZBAA-GA50V3–1
	2018, 2021, 4012	ZBAA-GA50V3–2
	B018	ZBAA-GA50V4–1
	2030, 2042, 4018, 4023	ZBAA-GA50V5–1
	2056, 4031, 4038	ZBAA-GA50V6–1
	2070, 2082	ZBAA-GA50V7–1
	4044, 4060	ZBAA-GA50V8–1

4-3. External Cooling Fin Installation Attachment

This attachment is required to do an external cooling fin installation.

The attachment model numbers are different between the V1000 and GA500.

Table 19 shows the GA500 attachment model numbers.

Table 19: External Cooling Fin Installation Attachment model numbers

Drive model type			Attachment type number
Three-phase 200 V class	Single-phase 200 V class	Three-phase 400 V class	
2001, 2002	B001, B002	–	ZPSA-GA50V1–1
2004	B004	–	ZPSA-GA50V1–2
2006	–	–	ZPSA-GA50V1–3
–	–	4001	ZPSA-GA50V2–1
–	B006	4002, 4004	ZPSA-GA50V2–2
2008, 2010, 2010	B010	4005, 4007, 4009	ZPSA-GA50V2–3
2018, 2021	B012	4012	ZPSA-GA50V3–1
–	B018	–	EZZ02568F
2030, 2042	–	4018, 4023	ZPSA-GA50V5–1
2056	–	4031, 4038	ZPSA-GA50V6–1
2070, 2082	–	–	ZPSA-GA50V7–1
–	–	4044, 4060	ZPSA-GA50V8–1

5. Replacing the Parameters

5-1. Parameter Replacement Procedure

- (1) Prepare a list of your customized settings changed from the factory defaults.
If you can turn on the V1000, you are recommended to check the parameters changed from the factory defaults in the V1000 Verify mode.
And take notes of your customized settings (changed values).
- (2) On the GA500, change the setting of A1-01 [Access Level Selection] from the factory default of 2 to 3 ([Expert Level]).
- (3) If you use an induction motor (IM):
 - 1) On the GA500, set A1-02 [Control Method Selection] to the same value as on the V1000.
 - 2) On the GA500, set the E: motor parameter settings (changed values) to the same values on the V1000,
 - 3) On the GA500, set the parameter settings other than the E: motor parameter settings (changed values) to the same values as on the V1000 with reference to "5-3 Parameter Matching Table".If you do not use an induction motor (IM):
On the GA500, set the parameter settings (changed values) to the same values as on the V1000 with reference to "5-3 Parameter Matching Table".

5-2. Checking for Changed Parameters Using the V1000's Verify Mode

- Turn on the V1000.
- Open the Verify mode screen (with "vrFY" flashing) using the [Up arrow key] or [Down arrow key].
- Push the [ENTER Key].
- "nonE" appears if no parameters have been changed from the factory defaults.
- If there are any changed parameters, they are displayed blinking.
- Push the [ENTER Key] to view the settings (changed values).
- Take notes of the displayed settings (changed values).
- Push the [ESC] key. The parameters are displayed blinking again.
- Push the [Up arrow key].
- As long as there are changed parameters, they are displayed blinking one by one in the alphabetical order.
- After the last changed parameter is displayed, the first displayed parameter is displayed again.
- This procedure is complete when you have taken notes of all the changed parameters (values).
- Turn off the V1000.

Note: Carefully note that the description above applies only to A1-02 [Control Method Selection] and that all other parameters, including A1-□□, A2-01 to A2-32, and E5-01 [PM Motor Code Selection], will not be displayed even if they have been changed from the factory defaults.

5-3. Parameter Matching Table

The V1000 parameters have the same numbers as those of the GA500 but may be different in the setting range or factory default. The following table lists the parameters different in the setting range or factory default.

Table 20: Parameter Matching Table

Parameter No.	Name	V1000			GA500	
		Default	Your customized settings	Range	Default	Range
A1-00	Language Selection	Depends on O2-09		0 = English 1 = Japanese 2 = German 3 = French 4 = Italian 5 = Spanish 6 = Portuguese 7 = Chinese (Simplified)	Depends on O2-09	0 = English 1 = Japanese 2 = German 3 = French 4 = Italian 5 = Spanish 6 = Portuguese 7 = Chinese (Simplified) 8 = Czech 9 = Russian 10 = Turkish 11 = Polish 12 = Greek
A1-01	Access Level Selection	2		0 = Operation Only 1 = Custom parameters 2 = All parameters	2	0 = Operation Only 1 = User Parameters 2 = Standard Parameters 3 = All Parameters (Including Expert Mode)
A1-02	Control Method Selection	0		0 = V/f Control 2 = Open Loop Vector 5 = OLV/PM	0	0 = V/f Control (V/f) 2 = Open Loop Vector Control (OLV) 5 = OLV/PM 6 = AOLV/PM 8 = EZOLV
A1-03	Initialize Parameters	0		0 = No Initialization 1110 = User Initialization 2220 = 2-Wire Initialization 3330 = 3-Wire Initialization 5550 = oPE04 error reset	0	0 = No Initialization 1110 = User Initialization 2220 = 2-Wire Initialization 3330 = 3-Wire Initialization
B2-01	DC Injection/ Zero Speed Threshold	0.5		0.0 to 10.0	1.0 for only A1-02=6, 0.5 for other	0.0 to 10.0 Hz
B2-13	Short Circuit Brake Time @ Stop	0.50		0.00 to 25.50	0 for A1-02=8, 0.50 for other	0.00 to 25.50 s
B3-14	Bi-directional Speed Search	0		0 = Disabled (rotate in the specified direction) 1 = Enabled (rotate in the searched direction)	0 (Depends on A1-02)	0 = Disabled (rotate in the specified direction) 1 = Enabled (rotate in the searched direction)

Parameter No.	Name	V1000			GA500	
		Default	Your customized settings	Range	Default	Range
b3-24	Speed Search Method Selection	0		0 = Current Detection Type 1 = Speed Estimation	2 (Depends on A1-02)	1 = Speed Estimation Speed Search 2 = Current Detection Speed Search
b8-01	Energy Saving Control Selection	0		0 = Energy saving mode disabled 1 = Energy saving mode enabled	0	0 = Energy saving mode disabled 1 = Energy saving mode enabled 2 = PM energy saving mode enabled (Configurable only when A1-02=6)
L2-01	Power Loss Ride Through Select	0		0 = Disabled 1 = Enabled 2 = Enabled while CPU Power Active	0	0 = Disabled 1 = Enabled 2 = Enabled while CPU Power Active 3 = KEB operation 4 = Kinetic Energy Backup: CPU Power 5 = Kinetic Energy Backup: DecelStop
L3-01	Stall Prevention during Accel	1		0 = Disabled 1 = Enabled 2 = Intelligent (Ignore Decel Ramp)	1	0 = Disabled 1 = Enabled 2 = Intelligent (Ignore Decel Ramp) 3 = Current Limit Method
L3-04	Stall Prevention during Decel	1		0 = Disabled 1 = General Purpose 2 = Intelligent (Ignore Decel Ramp) 3 = General Purpose w/ DB resistor 4 = Overexcitation/High Flux 7 = Overexcitation/High Flux 3	1	0 = Disabled 1 = General Purpose 2 = Intelligent (Ignore Decel Ramp) 3 = General Purpose w/ DB resistor 4 = Overexcitation/High Flux 1 5 = Overexcitation/High Flux 2 7 = Overexcitation/High Flux 3
L3-05	Stall Prevention during RUN	1		0 = Disabled 1 = Deceleration Time 1 (C1-02) 2 = Deceleration Time 2 (C1-04)	0 * When replacing V1000 with GA500, set L3-05=1.	0 = Disabled 1 = Deceleration Time 1 (C1-02) 2 = Deceleration Time 2 (C1-04) 3 = Intelligent
L8-40	Carrier Freq Reduction Off-Delay	0.50		0.00 to 2.00	0.50 for A1-02=0 or 2 0.00 for other	0.00 to 2.00 s
N1-01	Hunting Prevention Selection	1		0 = Hunting Prevention disabled 1 = Hunting Prevention enabled	1	0 = Hunting Prevention disabled 1 = Hunting Prevention enabled 2 = Hunting Prevention enabled (for High Carrier Frequency)
N3-02	HSB Current Limit Level	150		100 to 200	Depends on C6-01, L8-38	0 to 200 %

Parameter No.	Name	V1000			GA500	
		Default	Your customized settings	Range	Default	Range
N6-01	Online Tuning Selection	1		0: Disabled 1 = Line-to-Line Resistance Tuning	0 * When replacing V1000 with GA500, set N6-01=1.	0: Disabled 1 = Line-to-Line Resistance Tuning 2 = Voltage Correction Tuning * You cannot set N6-01=2 if you have enabled energy saving mode (b8-01).
N8-51	Pull-in Current @ Acceleration (for PM)	50		0 to 200	50 for A1-02=5, 80 for A1-02=8	0 to 200 %
O1-03	Frequency Display Unit Selection	0		0 = In units of 0.01 Hz 1 = In units of 0.01% (maximum output frequency is 100%) 2 = In units of min ⁻¹ (automatically calculated based on the maximum frequency and the number of motor poles) 3 = User Units	0.5 for A1-02=0 or 1, 0 for other	0 = In units of 0.01 Hz 1 = In units of 0.01% (maximum output frequency is 100%) 2 = In units of min ⁻¹ (automatically calculated based on the maximum frequency and the number of motor poles) 3 = User Units
O1-05	LCD brightness adjustment	3		0 to 5	5	0 to 10

6. Carrier Frequency and Rated Current Derating

The settings of A1-02 [Control Method Selection], C6-01 [Normal / Heavy Duty Selection], and C6-02 [Carrier Frequency Selection] determine the rated current derating. Also, it may be different between the V1000 and GA500 depending on the capacity.

If the capacity is such that the rated current is lower with the GA500 than with the V1000 (hatched in the table below), the carrier frequency should be lowered or the GA500 capacity should be increased.

Comparison of rated output current (A): V1000 versus GA500

V1000: A1-02=0, 2, 5

GA500: A1-02=0, 2, 5

Table 21: Carrier frequency and derating at heavy duty (HD) rating - three-phase 200 V class

Heavy duty (HD) rating (kW)	Model	Derated current value (A)					
	CIPR-GA50A □□□□	C6-02=1 (2.0kHz)	C6-02=2 (5.0kHz)	C6-02=3 (8.0kHz)	C6-02=4 (10.0kHz)	C6-02=5 (12.5kHz)	C6-02=6 (15.0kHz)
	CIMR-VA2A □□□□						
0.1	2001	0.8	0.8	0.8	0.8	0.7	0.6
	0001	0.8	0.8	0.8	0.8	0.7	0.6
0.2	2002	1.6	1.6	1.6	1.6	1.4	1.3
	0002	1.6	1.6	1.6	1.6	1.4	1.3
0.6	2004	3.0	3.0	3.0	3.0	2.7	2.4
	0004	3.0	3.0	3.0	3.0	2.7	2.4
0.8	2006	5.0	5.0	5.0	5.0	4.5	4.0
	0006	5.0	5.0	5.0	5.0	4.5	4.0
1.1	2008	6.9	6.9	6.9	6.5	6.0	5.5
	0008	6.9	6.9	6.9	6.5	6.0	5.5
1.5	2010	8.0	8.0	8.0	7.5	7.0	6.4
	0010	8.0	8.0	8.0	7.5	6.9	6.4
2.2	2012	11.0	11.0	11.0	10.4	9.6	8.8
	0012	11.0	11.0	11.0	10.3	9.5	8.8
3.0	2018	14.0	14.0	14.0	13.2	12.2	11.2
	0018	14.0	14.0	14.0	13.1	12.1	11.2
3.7	2021	17.6	17.6	17.6	16.6	15.3	14.1
	0021	17.5	17.5	17.5	16.4	15.2	14.0
5.5	2030	25.0	25.0	25.0	23.6	21.8	20.0
	0030	25.0	25.0	25.0	23.5	21.7	20.0
7.5	2042	33.0	33.0	33.0	31.1	28.8	26.4
	0042	33.0	33.0	33.0	31.0	28.6	26.4
11.0	2056	47.0	47.0	47.0	44.3	41.0	38.0
	0056	47.0	47.0	47.0	44.1	40.7	37.6
15.0	2070	60.0	60.0	60.0	56.6	52.3	48.0
	0070	60.0	60.0	60.0	56.3	52.0	48.0
18.5	2082	75.0	75.0	75.0	70.7	65.4	60.0
	-	-	-	-	-	-	-

Table 22: Carrier frequency and derating at heavy duty (HD) rating - three-phase 400 V class

Heavy duty (HD) rating (kW)	Model	Derated current value (A)					
	CIPR-GA50A □□□□	C6-02=1 (2.0kHz)	C6-02=2 (5.0kHz)	C6-02=3 (8.0kHz)	C6-02=4 (10.0kHz)	C6-02=5 (12.5kHz)	C6-02=6 (15.0kHz)
	CIMR-VA4A □□□□						
0.2	4001	1.2	1.2	1.2	1.1	0.9	0.7
	0001	1.2	1.2	1.2	1.1	0.9	0.7
0.4	4002	1.8	1.8	1.8	1.6	1.3	1.1
	0002	1.8	1.8	1.8	1.6	1.3	1.1
0.75	4004	3.4	3.4	3.4	3.0	2.5	2.0
	0004	3.4	3.4	3.4	3.0	2.5	2.0
1.5	4005	4.8	4.8	4.8	4.3	3.6	2.9
	0005	4.8	4.8	4.8	4.3	3.6	2.9
2.2	4007	5.5	5.5	5.5	4.9	4.1	3.3
	0007	5.5	5.5	5.5	4.9	4.1	3.3
3.0	4009	7.3	7.3	7.3	6.5	5.4	4.4
	0009	7.2	7.2	7.2	6.4	5.3	4.3
3.7	4012	9.2	9.2	9.2	8.1	6.8	5.5
	0011	9.2	9.2	9.2	8.1	6.8	5.5
5.5	4018	14.5	14.5	14.5	12.8	10.8	8.7
	0018	14.8	14.8	14.8	13.1	11.0	8.9
7.5	4023	18.0	18.0	18.0	15.9	13.4	10.8
	0023	18.0	18.0	18.0	15.9	13.4	10.8
11.0	4031	24.0	24.0	24.0	21.3	17.8	14.4
	0031	24.0	24.0	24.0	21.3	17.8	14.4
15.0	4038	31.0	31.0	31.0	27.5	23.0	18.6
	0038	31.0	31.0	31.0	27.5	23.0	18.6
18.5	4044	39.0	39.0	39.0	34.5	29.0	23.4
22.0	4060	45.0	45.0	45.0	39.9	33.4	27.0

Table 23: Carrier frequency and derating at normal duty (ND) rating - three-phase 200 V class

Normal Duty (ND) Rating (kW)	Model	Carrier Frequency and Derating (A)					
	CIPR-GA50A □□□□	C6-02=1 (2.0kHz)	C6-02=2 (5.0kHz)	C6-02=3 (8.0kHz)	C6-02=4 (10.0kHz)	C6-02=5 (12.5kHz)	C6-02=6 (15.0kHz)
	CIMR-VA2A □□□□						
0.1	2001	1.2	1.1	1.0	0.9	0.8	0.6
	0001	1.2	1.1	0.9	0.8	0.7	0.6
0.2	2002	1.9	1.9	1.7	1.6	1.4	1.3
	0002	1.9	1.8	1.7	1.6	1.5	1.3
0.6	2004	3.5	3.5	3.2	3.0	2.7	2.4
	0004	3.5	3.3	3.1	3.0	2.7	2.4
0.8	2006	6.0	6.0	5.4	5.0	4.5	4.0
	0006	6.0	5.6	5.3	5.0	4.5	4.0
1.1	2008	8.0	7.6	7.0	6.6	6.0	5.5
	0008	8.0	7.5	6.9	6.5	6.0	5.5
1.5	2010	9.6	9.1	8.3	7.7	7.1	6.4
	0010	9.6	8.8	8.0	7.5	7.0	6.4
2.2	2012	12.2	11.9	11.0	10.4	9.6	8.8
	0012	12.0	11.5	11.0	10.4	9.6	8.8
3.0	2018	17.5	16.5	14.9	13.8	12.5	11.2
	0018	17.5	15.8	14.0	13.2	12.2	11.2
3.7	2021	21.0	19.8	18.1	17.0	15.5	14.1
	0021	19.6	18.6	17.5	16.5	15.3	14.0
5.5	2030	30.0	28.3	25.8	24.2	22.1	20.0
	0030	30.0	27.5	25.0	23.6	21.8	20.0
7.5	2042	42.0	39.4	35.5	32.9	29.7	26.4
	0042	40.0	36.5	33.0	31.1	28.8	26.4
11.0	2056	56.0	52.9	48.3	45.3	41.4	37.6
	0056	56.0	51.5	47.0	44.3	41.0	37.6
15.0	2070	70.0	66.3	60.8	57.2	52.6	48.0
	0070	69.0	64.5	60.0	56.6	52.3	48.0
18.5	2082	82.0	81.4	75.0	70.7	65.4	60.0

Table 24: Carrier frequency and derating at normal duty (ND) rating - three-phase 400 V class

Normal Duty (ND) Rating (kW)	Model	Carrier Frequency and Derating (A)					
	CIPR-GA50A □□□□	C6-02=1 (2.0kHz)	C6-02=2 (5.0kHz)	C6-02=3 (8.0kHz)	C6-02=4 (10.0kHz)	C6-02=5 (12.5kHz)	C6-02=6 (15.0kHz)
	CIMR-VA4A □□□□						
0.1	4001	1.2	1.2	1.2	1.1	0.9	0.7
	0001	1.2	1.2	1.2	1.1	0.9	0.7
0.2	4002	2.1	2.1	1.8	1.6	1.3	1.1
	0002	2.1	2.0	1.8	1.6	1.4	1.1
0.6	4004	4.1	4.0	3.4	3.0	2.5	2.0
	0004	4.1	3.8	3.4	3.0	2.5	2.0
0.8	4005	5.4	5.4	4.8	4.2	3.6	2.9
	0005	5.4	5.1	4.8	4.3	3.6	2.9
1.1	4007	7.1	6.5	5.5	4.9	4.1	3.3
	0007	6.9	6.2	5.5	4.9	4.1	3.3
1.5	4009	8.9	8.6	7.3	6.5	5.4	4.4
	0009	8.8	8.0	7.2	6.4	5.3	4.3
2.2	4012	11.9	10.8	9.2	8.2	6.8	5.5
	0011	11.1	10.2	9.2	8.1	6.8	5.5
3.0	4018	17.5	17.0	14.5	12.8	10.8	8.7
	0018	17.5	16.2	14.8	13.1	11.0	8.9
3.7	4023	23.4	21.3	18.2	16.1	13.4	10.8
	0023	23.0	20.5	18.0	15.9	13.4	10.8
5.5	4031	31.0	28.2	24.1	21.3	17.9	14.4
	0031	31.0	27.5	24.0	21.3	17.8	14.4
7.5	4038	38.0	36.3	31.0	27.5	23.0	18.6
	0038	38.0	34.5	31.0	27.5	23.0	18.6
11.0	4044	44.0	44.0	39.0	34.5	29.0	23.4
15.0	4060	60.0	54.5	46.3	40.8	33.9	27.0

Table 25: Carrier frequency and derating at heavy duty (HD) rating - single-phase 200 V class

Heavy duty (HD) rating (kW)	Model	Carrier Frequency and Derating (A)					
	CIPR-GA50A □□□□	C6-02=1 (2.0kHz)	C6-02=2 (5.0kHz)	C6-02=3 (8.0kHz)	C6-02=4 (10.0kHz)	C6-02=5 (12.5kHz)	C6-02=6 (15.0kHz)
	CIMR-VABA □□□□						
0.1	B001	0.8	0.8	0.8	0.8	0.7	0.6
	0001	0.8	0.8	0.8	0.8	0.7	0.6
0.2	B002	1.6	1.6	1.6	1.6	1.4	1.3
	0002	1.6	1.6	1.6	1.6	1.4	1.3
0.6	B004	3.0	3.0	3.0	3.0	2.7	2.4
	0003	3.0	3.0	3.0	3.0	2.7	2.4
0.8	B006	5.0	5.0	5.0	5.0	4.5	4.0
	0005	5.0	5.0	5.0	5.0	4.5	4.0
1.1	B010	8.0	8.0	8.0	7.5	7.0	6.4
	0010	8.0	8.0	8.0	7.5	6.9	6.4
1.5	B012	11.0	11.0	11.0	10.4	9.6	8.8
	0012	11.0	11.0	11.0	10.3	9.5	8.8
2.2	B018	17.6	17.6	17.6	16.6	15.3	14.1
	0018	17.5	17.5	17.5	16.4	15.2	14.0

Table 26: Carrier frequency and derating at normal duty (ND) rating - single-phase 200 V class

Normal Duty (ND) Rating (kW)	Model	Carrier Frequency and Derating (A)					
	CIPR-GA50A □□□□	C6-02=1 (2.0kHz)	C6-02=2 (5.0kHz)	C6-02=3 (8.0kHz)	C6-02=4 (10.0kHz)	C6-02=5 (12.5kHz)	C6-02=6 (15.0kHz)
	CIMR-VABA □□□□						
0.1	B001	1.2	1.1	1.0	0.9	0.8	0.6
	0001	1.2	1.1	0.9	0.8	0.7	0.6
0.2	B002	1.9	1.9	1.7	1.6	1.4	1.3
	0002	1.9	1.8	1.7	1.6	1.5	1.3
0.6	B004	3.5	3.5	3.2	3.0	2.7	2.4
	0003	3.3	3.2	3.1	3.0	2.7	2.4
0.8	B006	6.0	6.0	5.4	5.0	4.5	4.0
	0006	6.0	5.6	5.3	5.0	4.5	4.0
1.1	B010	9.6	9.1	8.3	7.7	7.1	6.4
	0010	9.6	8.8	8.0	7.5	7.0	6.4
1.5	B012	12.2	11.9	11.0	10.4	9.6	8.8
	0012	12.0	11.5	11.0	10.4	9.6	8.8
2.2	B018	21.0	19.8	18.1	17.0	15.5	14.1

Revision History

Revision number	Date	Changes
First edition	2019.03.25	First edition