YASKAWA

YASKAWA AC Drive-V1000 Option

CompoNet
Installation Manual

Type SI-M3/V

To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.

V1000オプションユニット

CompoNet通信
取扱説明書

形式 SI-M3/V

製品を安全にお使い頂くために，この取扱説明書を必ずお読みください。
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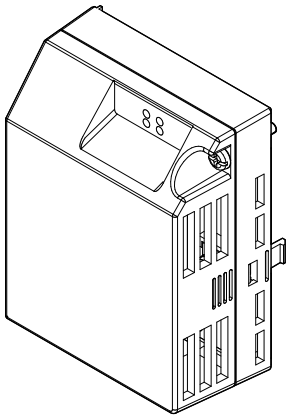


MANUAL NO. TOBP C730600 54A

Table of Contents

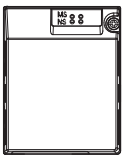
1 Preface and Safety

Yaskawa manufactures products used as components in a wide variety of industrial systems and equipment. The selection and application of Yaskawa products remain the responsibility of the equipment manufacturer or end user. Yaskawa accepts no responsibility for the way its products are incorporated into the final system design. Under no circumstances should any Yaskawa product be incorporated into any product or design as the exclusive or sole safety control. Without exception, all controls should be designed to detect faults dynamically and fail safely under all circumstances. All systems or equipment designed to incorporate a product manufactured by Yaskawa must be supplied to the end user with appropriate warnings and instructions as to the safe use and operation of that part. Any warnings provided by Yaskawa must be promptly provided to the end user. Yaskawa offers an express warranty only as to the quality of its products in conforming to standards and specifications published in the Yaskawa manual. NO OTHER WARRANTY, EXRESS OR IMPLIED, IS OFFERED. Yaskawa assumes no liability for any personal injury, property damage, losses, or claims arising from misapplication of its products.

◆ Applicable Documentation

The following manuals are available for the CompoNet option:

CompoNet Option

	Yaskawa AC Drive V1000-Series Option SI-M3/V CompoNet Installation Manual Manual No: TOBP C730600 54	Read this manual first. The installation manual is packaged with the option and contains information required to install the option and set up related drive parameters.
	Yaskawa AC Drive V1000-Series Option SI-M3/V CompoNet Technical Manual Manual No: SIEP C730600 54	The technical manual contains detailed information about the option. In the U.S., access http://www.yaskawa.com to obtain the technical manual. Customers in other areas should contact a Yaskawa representative.

Yaskawa Drive

	Yaskawa AC Drive V1000 Quick Start Guide	The drive manuals cover basic installation, wiring, operation procedures, functions, troubleshooting, and maintenance information. The manuals also include important information about parameter settings and drive tuning. Access these sites to obtain Yaskawa instruction manuals: U.S.: http://www.yaskawa.com Europe: http://www.yaskawa.eu.com Japan: http://www.e-mechatronics.com Other areas: contact a Yaskawa representative. For questions, contact your local Yaskawa sales office or the nearest Yaskawa representative.
	Yaskawa AC Drive V1000 Technical Manual	

◆ Terms

Note:	Indicates supplemental information that is not related to safety messages
Drive:	Yaskawa AC Drive V1000-Series
Option:	Yaskawa AC Drive V1000-Series SI-M3/V CompoNet Option
≥ 1020:	Indicates a drive feature or function that is only available in drive software version 1020 or greater

◆ Registered Trademarks

- CompoNet is a trademark of the ODVA.
- All trademarks are the property of their respective owners.

◆ Supplemental Safety Information

Read and understand this manual before installing, operating, or servicing this option. Install the option according to this manual and local codes.

The following conventions indicate safety messages in this manual. Failure to heed these messages could cause fatal injury or damage products and related equipment and systems.

⚠ DANGER

Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates an equipment damage message.

■ General Safety

General Precautions
• The diagrams in this book may include options and drives without covers or safety shields to illustrate details. Be sure to reinstall covers or shields before operating any devices. Use the option according to the instructions described in this manual. • Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all products to which this manual is applicable. • The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual. • When ordering new copies of the manual, contact a Yaskawa representative or the nearest Yaskawa sales office and provide the manual number shown on the front cover.

⚠ DANGER

Heed the safety messages in this manual.

Failure to comply will result in death or serious injury.

The operating company is responsible for any injuries or equipment damage resulting from failure to heed the warnings in this manual.

NOTICE

Do not expose the drive or option to halogen group disinfectants.

Failure to comply may cause damage to the electrical components in the option.

Do not pack the drive in wooden materials that have been fumigated or sterilized.

Do not sterilize the entire package after the product is packed.

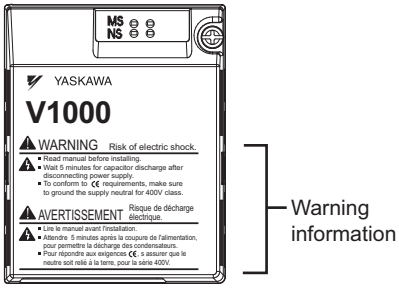
Do not modify the drive or option circuitry.

Failure to comply could result in damage to the drive or option and will void warranty.

Yaskawa is not responsible for any modification of the product made by the user. This product must not be modified.

■ Option Unit Warning Labels

Warning information is displayed on the option unit as shown in the figure below. Follow all warnings and safety instructions when using the product.
When using the drive in an area that may require displaying warning information in Japanese or Chinese, a warning label is provided with the option. This label can be placed over the English and French warnings on the front of the option.



■ Warning Contents

WARNING Risk of electric shock.

- Read manual before installing.
- Wait 5 minutes for capacitor discharge after disconnecting power supply.
- To conform to CE requirements, make sure to ground the supply neutral for 400V class.

AVERTISSEMENT Risque de décharge électrique.

- Lire le manuel avant l'installation.
- Attendre 5 minutes après la coupure de l'alimentation, pour permettre la décharge des condensateurs.
- Pour répondre aux exigences CE, s assurer que le neutre soit relié à la terre, pour la série 400V.

2 Product Overview

◆ About This Product

The CompoNet option provides a communications connection between the drive and an ODVA CompoNet network. The SI-M3/V CompoNet Option connects the drive to a CompoNet network and facilitates the exchange of data.

This manual explains the handling, installation and specifications of this product.

CompoNet is a communications link to connect industrial devices (such as sensors and variable frequency drives) as well as masters (such as programmable controllers) to a CIP network.

By installing the CompoNet Option to a drive, it is possible to do the following from a CompoNet master device:

- operate the drive
- monitor the operation status of the drive
- change parameter settings.

◆ Applicable Models

The CompoNet Option can be used with the drive models in ***Table 1***.

Table 1 Applicable Models

Drive	Software Version <1>
CIMR-V□□A□□□□AA□	≥ 1020
CIMR-V□□A□□□□BA□	≥ 1020
CIMR-V□□A□□□□FA□	≥ 1020

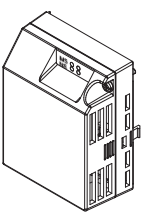
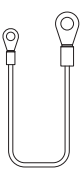
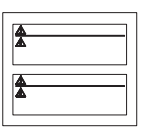
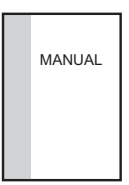
<1> See “PRG” on the drive nameplate for the software version number.

3 Receiving

Please perform the following tasks after receiving the option:

- Inspect the option for damage. Contact the shipper immediately if the option appears damaged upon receipt.
- Verify receipt of the correct model by checking the model number printed on the option nameplate (***Refer to Top Views of Option on page 11*** for nameplate positioning).
- Contact your supplier if you have received the wrong model or the option does not function properly.

◆ Option Package Contents

Description:	Option Unit	Ground Wire	Warning Labels	Installation Manual
–				
Quantity:	1	4	1	1

◆ Tools Required for Installation

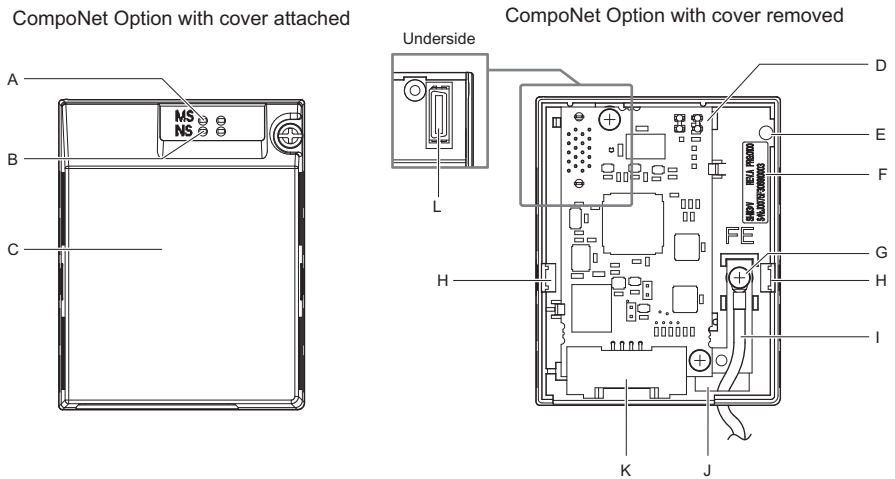
A Phillips screwdriver (M3 metric/#1, #2 U.S. standard size*) is required to install the option and remove drive front covers.

*Screw sizes vary by drive capacity. Select a screwdriver appropriate for the drive capacity.

Note: Tools and parts required to prepare option networking cables for wiring are not listed in this manual. Refer to the ODVA website for more information.

4 Option Components

◆ SI-M3/V CompoNet Option



A – LED (MS) *<1>*
B – LED (NS) *<1>*
C – Option cover
D – CompoNet PCB
E – Screw hole (attaching option cover)
F – Nameplate
G – Functional Earth cable connection (FE)
H – Mounting tabs
I – Ground wire *<2>*
J – Pass-through hole for wire
K – Communication cable connector
L – Option connector

<1> *Refer to Option LED Display on page 13* for details on the LEDs.
<2> The ground wire provided in the option shipping package must be connected during installation.

Figure 1 Top Views of Option

◆ Dimensions

The installed option adds 27 mm (1.06 in.) to the total depth of the drive.

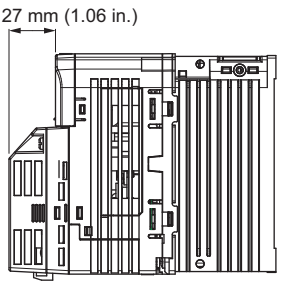


Figure 2 Dimensions

◆ Communication Cable Connector

The communication connector on the option is a 4-pin pluggable female connector. This connector is the connection point for a customer supplied CompoNet network communication cable.

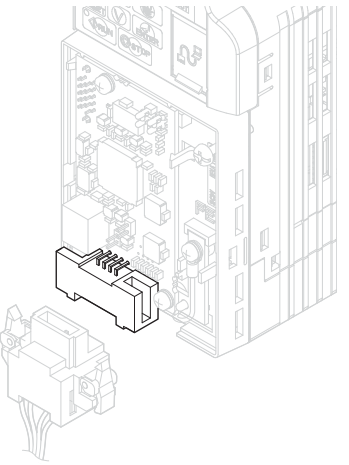


Figure 3 Communication Cable Connector

Table 2 Communication Cable Connector Descriptions

Pin	Cable color	Signal	Description
1	Red	BS+	Communications DC +24V <1>
2	White	BDH	Comm Data High
3	Blue	BDL	Comm Data Low
4	Black	BS-	Network Common <1>

<1> Not used with the CompoNet Option

◆ Option LED Display

The option has two bicolor, red/green LEDs: one for Module Status (MS) and one for Network Status (NS).

The operational states of the LEDs after the CompoNet power-up diagnostic LED sequence are described in ***Table 3***. Wait at least 2 seconds for the power-up diagnostic process to complete before verifying the states of the LEDs.

Table 3 Option LED States

Name	Indication		Operating Status	Remarks
	Color	Status		
MS	–	OFF	Power supply OFF	Power is not being supplied to the drive.
	Green	ON	Option operating	The option is operating normally.
	Green	Flashing	Option initializing	Incorrect settings must be corrected.
	Red	ON	Fatal error occurred	A fatal (irrecoverable) error occurred in the option.
	Red	Flashing	Non-fatal error occurred	A non-fatal (recoverable) error occurred.
	Green/ Red	Flashing	Device self-test	Device in self-test mode.

Name	Indication		Operating Status	Remarks
	Color	Status		
NS	–	OFF	Offline or Power supply OFF	Device is not online. • The transmission speed is being checked. • Power is not being supplied.
	Green	ON	Online communications established	Device is online with connections in the established state. I/O connection is established with other nodes.
	Green	Flashing	Online communications not established	Device is online, but no connections in the established state. The transmission speed is determined, but the I/O connection with other nodes is not established.
	Red	ON	Communications error	An error occurred disabling CompoNet communications. • MAC ID duplication • Bus off detected
	Red	Flashing	Communications time-out	A communications time-out occurred with th master.

◆ Power-Up Diagnostics

An LED test is performed each time the drive is powered up. The initial boot sequence may take several seconds. After the LEDs have completed the diagnostic LED sequence as shown in ***Table 4***, the option is successfully initialized. The LEDs then assume operational conditions as shown in ***Table 3***.

Table 4 Power-Up Diagnostic LED Sequence

Sequence	Module Status (MS)	Network Status (NS)	Time (ms)
1	Green	OFF	250
2	Red	OFF	250
3	Green	Green	250
4	Green	Red	250
5	Green	OFF	-

◆ Option MAC ID

The option is a word MIX slave. The maximum allowable MAC ID differs depending on the settings for F6-52 (PCA setting) and F6-53 (PPA setting). The maximum MAC ID is obtained by the following equation:

Maximum MAC ID = 64 - (Number of words for the I/O size of PCA or PPA)

Note: Use the larger value between PCA or PPA for the equation.

Example: When F6-52 = 21 (2 words) and F6-53 = 71 (2 words), the maximum allowable MAC ID is 62.

■ Parameter F6-40, MAC ID Setting 0 to 63

The option MAC ID is set by drive parameter F6-40. MAC ID settings between 0~63 are considered a valid MAC IDs.

The option reads the MAC ID value from parameter F6-40 upon power-up and upon a network reset.

◆ Option Baud Rate

The option supports standard baud rates of 93.75 kbps, 1.5 Mbps, 3 Mbps, and 4 Mbps.

Table 5 Parameter F6-41 Baud Rate Setting

Description	Value
93.75 kbps	0
Auto Detect	1
1.5 Mbps	2
3 Mbps	3
4 Mbps	4

■ Auto Baud Rate Sensing (F6-41 = 1)

Setting parameter F6-41 to 1 enables automatic baud rate detection and allows the option to automatically determine the baud rate of the CompoNet network.

Connect the master to the CompoNet network to automatically detect the baud rate. While the option is detecting the baud rate, option LEDs will be (NS=OFF and MS=solid green).

5 Installation Procedure

◆ Section Safety

⚠ DANGER

Electrical Shock Hazard

Do not connect or disconnect wiring while the power is on.

Failure to comply will result in death or serious injury.

Disconnect all power to the drive, wait at least five minutes after all indicators are off, measure the DC bus voltage to confirm safe level, and check for unsafe voltages before servicing. The internal capacitor remains charged after the power supply is turned off. The charge indicator LED will extinguish when the DC bus voltage is below 50 Vdc.

⚠ WARNING

Electrical Shock Hazard

Do not remove the option cover while the power is on.

Failure to comply could result in death or serious injury.

The diagrams in this section may include options and drives without covers or safety shields to show details. Be sure to reinstall covers or shields before operating any devices. Use the option according to the instructions described in this manual.

Do not allow unqualified personnel to use equipment.

Failure to comply could result in death or serious injury.

Maintenance, inspection, and replacement of parts must be performed only by authorized personnel familiar with installation, adjustment, and maintenance of this product.

Do not touch circuit boards while the power to the drive is on.

Failure to comply could result in death or serious injury.

Do not use damaged wires, stress the wiring, or damage the wire insulation.

Failure to comply could result in death or serious injury.

⚠ WARNING

Fire Hazard

Tighten all terminal screws to the specified tightening torque.

Loose electrical connections could result in death or serious injury by fire due to overheating of electrical connections.

NOTICE

Damage to Equipment

Observe proper electrostatic discharge (ESD) procedures when handling the option card, drive, and circuit boards.

Failure to comply may result in ESD damage to circuitry.

Never shut the power off while the drive is running or outputting voltage.

Failure to comply may cause the application to operate incorrectly or damage the drive.

Do not operate damaged equipment.

Failure to comply may cause further damage to the equipment.

Do not connect or operate any equipment with visible damage or missing parts.

Do not use unshielded cable for control wiring.

Failure to comply may cause electrical interference resulting in poor system performance.

Use shielded twisted-pair wires and ground the shield to the ground terminal of the drive.

Properly connect all pins and connectors.

Failure to comply may prevent proper operation and possibly damage equipment.

Check wiring to ensure that all connections are correct after installing the option and connecting any other devices.

Failure to comply may result in damage to the option.

◆ Prior to Installing the Option

Prior to installing the option, wire the drive, make necessary connections to the drive terminals, and verify that the drive functions normally without the option installed. Refer to the Quick Start Guide packaged with the drive for information on wiring and connecting the drive.

◆ Installing the Option

Refer to the instructions below to install the option.

1. Shut off power to the drive, wait at least five minutes after comfirming the DC bus voltage becomes safe level, then loosen the screw that fastens the front cover in place and remove the front cover. This drive front cover will be replaced by the option cover. Cover removal varies depending on drive size.

DANGER! *Electrical Shock Hazard. Do not connect or disconnect wiring while the power is on. Failure to comply will result in death or serious injury. Before installing the option, disconnect all power to the drive. The internal capacitor remains charged even after the power supply is turned off. The charge indicator LED will extinguish when the DC bus voltage is below 50 Vdc. To prevent electric shock, wait at least five minutes after all indicators are off and measure the DC bus voltage level to confirm safe level.*

NOTICE: *Damage to Equipment. Observe proper electrostatic discharge procedures (ESD) when handling the option, drive, and circuit boards. Failure to comply may result in ESD damage to circuitry.*

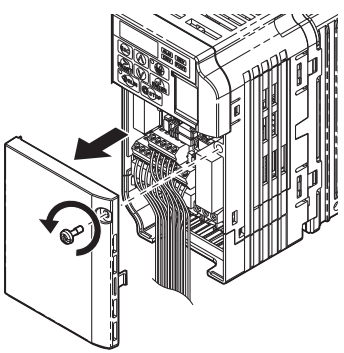


Figure 4 Remove the Front Cover

2. The remaining installation steps differ based on drive model. Find the drive model number on the drive nameplate and refer to the step indicated in ***Table 6*** based on your model number.

Table 6 Installation Steps Based on Drive Model

Enclosure Type	Drive Model	Steps to Follow	Page
IP20/Open-Chassis	CIMR-V□□A□□□□B	*3. 4. <2>*	*19*, *20*
IP20/NEMA Type 1 *<1>*	CIMR-V□□A□□□□F	*6. 7. 8. <2>*	*20*, *21*, *22*

<1> Installing the option on an IP20/NEMA Type 1 enclosure drive voids NEMA Type 1 protection while maintaining IP20 conformity
<2> After performing each step, proceed to step *9.*

3. For IP20/Open-Chassis models CIMR-V□□A□□□□B, Remove the bottom cover of the drive by applying pressure to the tabs on each side of the bottom cover. Pull the bottom cover away from the drive while pushing in on the tabs to release the cover from the drive. Refer to ***Figure 5*** for details.
Refer to ***Figure 6*** for drive models CIMR-V□BA0006B to BA0018B, 2A0008B to 2A0069B, and 4A0001B to 4A0038B, which require removing the terminal cover prior to removing the bottom cover.

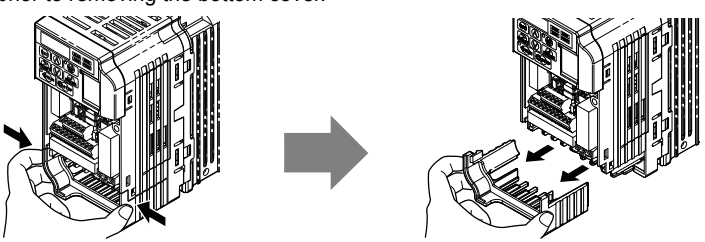


Figure 5 Remove the Bottom Cover on an IP20/Open-Chassis Drive (Models CIMR-V□BA0001B to BA0003B and 2A0001B to 2A0006B)

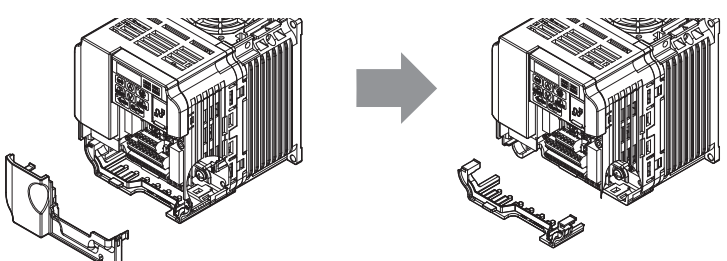


Figure 6 Remove the Terminal Cover and Bottom Cover on an IP20/Open-Chassis Drive (Models CIMR-V□BA0006B to BA0018B; 2A0008B to 2A0069B; 4A0001B to 4A0038B)

4. On IP20/Open-Chassis models, connect the drive-side of the ground wire to the drive ground terminal.

Note: The four different ground wires packaged with the option connect the option to different drive models. Select the proper ground wire depending on drive size.

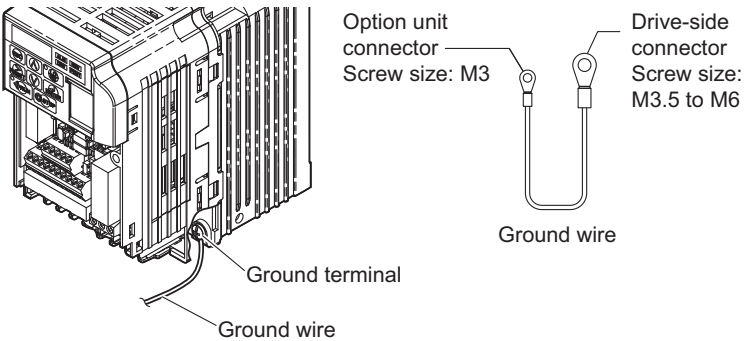


Figure 7 Connect the Ground Wire on an IP20/Open-Chassis Drive

5. For IP20/Open-Chassis models, go to Step ***9.*** on page ***23***.

6. For IP20/NEMA Type 1 Enclosure models CIMR-V□□A□□□□F, loosen the screw on the front of the NEMA Type 1 terminal cover and remove it from the drive. Refer to ***Figure 8*** for details
Refer to ***Figure 9*** for drive models CIMR-V□BA0006F to BA0018F, 2A0008F to 2A0069F, and 4A0001F to 4A0038F, which require removing the plastic terminal cover prior to removing NEMA Type 1 terminal cover.

Note: Installing the option on an IP20/NEMA Type 1 enclosure drive voids NEMA Type 1 protection while maintaining IP20 conformity.

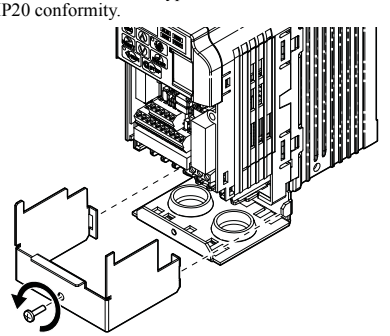


Figure 8 Remove the NEMA Type 1 Terminal Cover

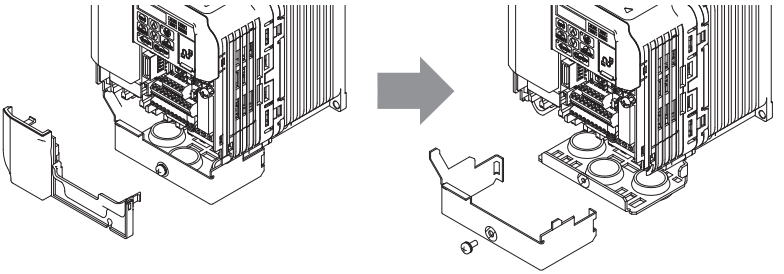


Figure 9 Remove the Terminal Cover on an IP20/NEMA Type 1 Drive (Models CIMR-V□BA0006F to BA0018F; 2A0008F to 2A0069F; 4A0001F to 4A0038F)

7. Loosen the screws attaching the NEMA Type 1 conduit bracket to the drive to remove the NEMA Type 1 conduit bracket.

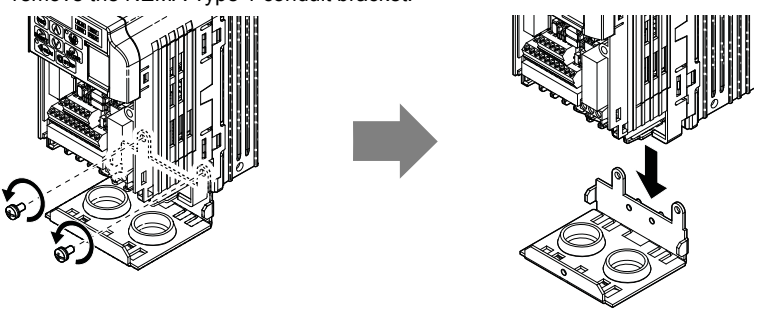


Figure 10 Remove the NEMA Type 1 Conduit Bracket

8. On NEMA Type 1 enclosure drives, the screw for the drive ground terminal also acts as one of the screws that attaches the NEMA Type 1 conduit bracket to the drive. Reattach the NEMA Type 1 conduit bracket according to ***Figure 11*** and connect the drive-side of the ground wire to the drive ground terminal.

Note: The four different ground wires packaged with the option connect the option to different drive models. Select the proper ground wire depending on drive size.

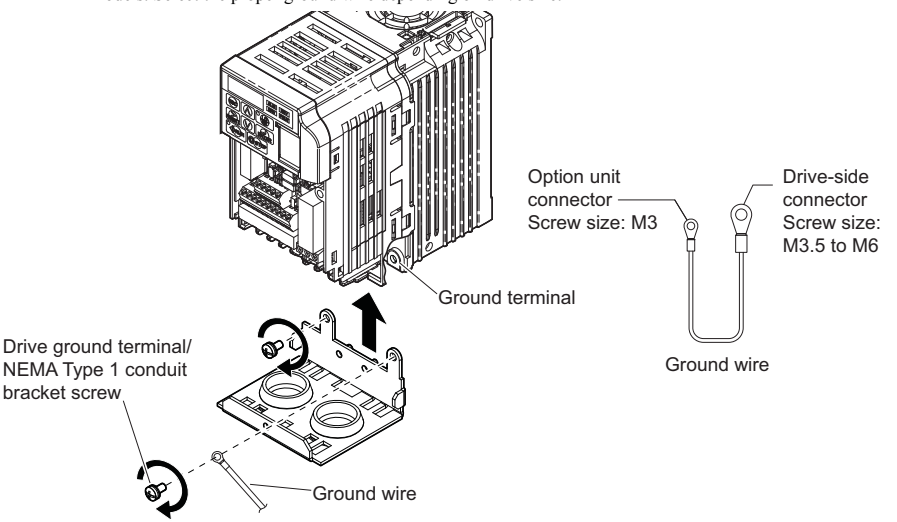
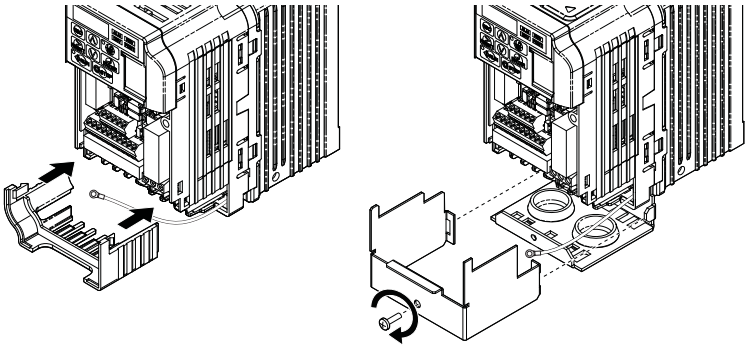


Figure 11 Reattach the NEMA Type 1 Conduit Bracket and Connect the Ground Wire

9. Reattach the bottom cover. Keep the ground wire inside of the bottom cover when reattaching.



IP20/Open-Chassis IP20/NEMA Type 1 Enclosure

Figure 12 Reattach the Bottom Cover

10. On models CIMR-V□BA0006□ to BA0018□, 2A0008□ to 2A0069□, and 4A0001□ to 4A0038□, reattach the terminal cover.
Refer to ***Figure 14*** for drive models CIMR-V□BA0006□ to BA0018□, 2A0008□ to 2A0020□, and 4A0001□ to 4A0011□, which require routing the ground wire through the provided notch when reinstalling the terminal cover.

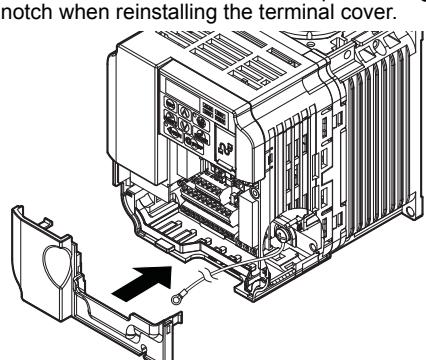


Figure 13 Reattach the Terminal Cover
(Models CIMR-V□BA0006□ to BA0018□; 2A0008□ to 2A0069□; 4A0001□ to 4A0038□)

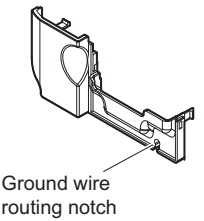


Figure 14 Terminal Cover Ground Wire Notch
(Models CIMR-V□BA0006□ to BA0018□; 2A0008□ to 2A0020□; 4A0001□ to 4A0011□)

11. Pass the ground wire through the inside of the drive bottom cover and into the through-hole for the ground wire at the front of the option.

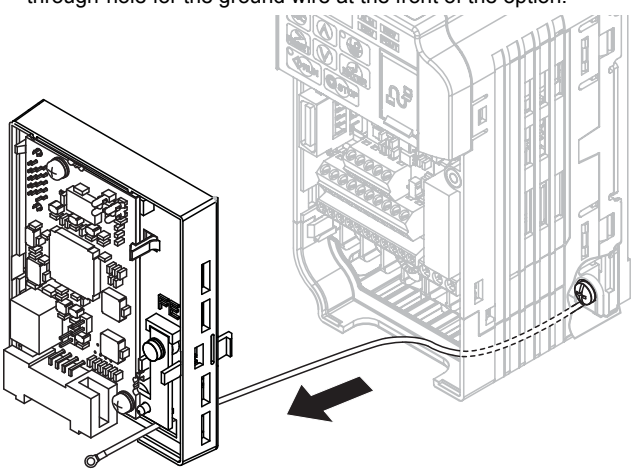


Figure 15 Ground Wire Routing

12. Attach the option to the drive. Properly seat the tabs on the left and right sides of the option to the drive case.

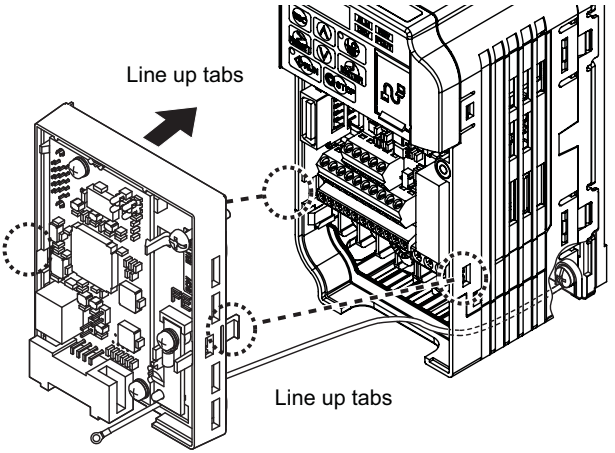


Figure 16 Connect the Option

13. Connect the ground wire at the option ground terminal. Tighten the screw to 0.5 ~ 0.6 Nm or (4.4 ~ 5.3 in lbs) using an M3 Phillips screwdriver. Firmly plug the CompoNet cable connector into the option.

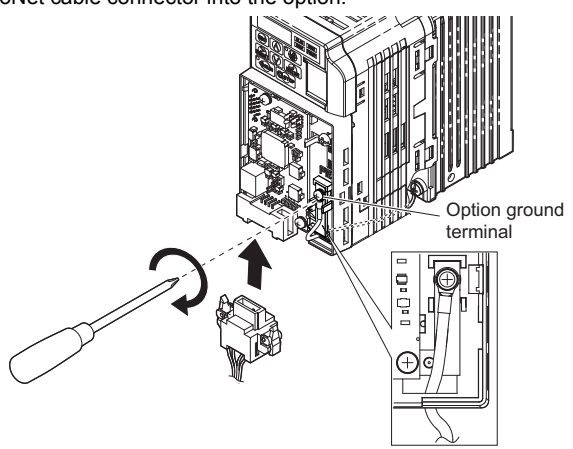


Figure 17 Connect the Ground Wire and CompoNet Cable Connector to the Option

Connection Diagram

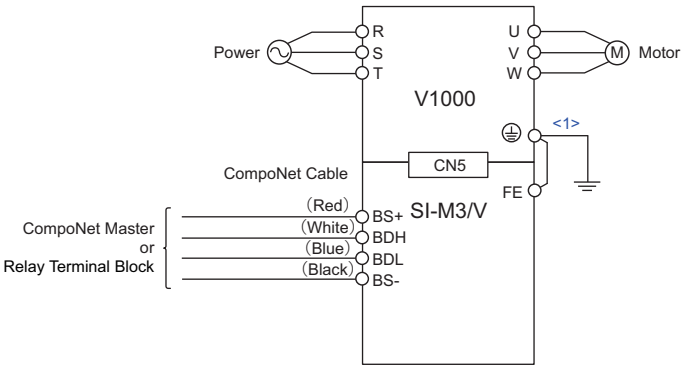


Figure 18 Wiring Diagram

<1> The ground wire provided in the option shipping package must be connected during installation.

14. Attach the option cover by aligning the tabs with the mounting holes, seat the front cover into place, and tighten the screw on the front.

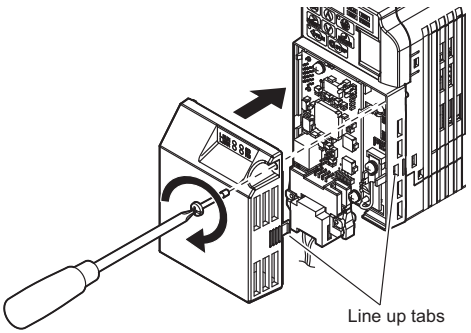


Figure 19 Attach the Option Cover

Note: Take proper precautions when wiring the option so that the front covers will easily fit back onto the drive. Make sure no cables are pinched between the front covers and the drive when replacing the covers.

Note: A replacement safety label is provided when using the drive in areas that may require displaying warning information in Japanese or Chinese. This label can be placed over the English and French warnings on the option cover.

15. Set drive parameters in ***Table 9*** for proper option performance.

◆ Network Configuration Restrictions

Some restrictions apply to CompoNet network configuration and vary in accordance with the type of cable being used.

Refer to the ODVA website at www.odva.org for more information.

■ When Using Round Cable I

Table 7 Wiring Length when Using Round Cable I

Communication Speed	Max. Length of Trunk Line	Max. Length of Branch Line	Total Length of Branch Lines	Max. No. of Slaves per Branch Line	Max. Length of Sub-branch Line	Total Length of Sub-branch Lines
4 Mbps	30 m	0 m	0 m	0	0 m	0 m
3 Mbps	30 m	0.5 m	8 m	1	0 m	0 m
1.5 Mbps	100 m	0 m	0 m	0	0 m	0 m
	30 m	2.5 m	25 m	3	0 m	0 m
93.75 kbps	500 m	6 m	120 m	1	0 m	0 m

■ When Using Round Cable II and Flat Cable I/II

Table 8 Wiring Length when Using Round Cable II and Flat Cable I/II

Communication Speed	Max. Length of Trunk Line	Max. Length of Branch Line	Total Length of Branch Lines	Max. No. of Slaves per Branch Line	Max. Length of Sub-branch Line	Total Length of Sub-branch Lines
4 Mbps	30 m	0 m	0 m	0	0 m	0 m
3 Mbps	30 m	0.5 m	8 m	1	0 m	0 m
1.5 Mbps	30 m	2.5 m	25 m	3	0.1 m	2 m
93.75 kbps	200 m	If total wiring length is 200 m or shorter, no limits apply.				

■ Termination Resistor Connection

Install a termination resistor when connecting the option to the end of a trunk or sub-trunk line (121 Ω, ±1%, 1/4W).

◆ EDS Files

For easy network implementation of drives equipped with the SI-M3/V option, an EDS file can be obtained from:

U.S.: http://www.yaskawa.com

Other areas: Contact a Yaskawa representative.

6 Related Parameters

The following parameters are used to set up the drive for operation with the option.

Confirm proper setting of parameters in *Table 9* before starting network communications.

Table 9 Related Parameters

No. (Addr. Hex)	Name	Description	Values
b1-01 (180) <1>	Frequency Reference Selection	Selects the frequency reference input source 0: Operator - Digital preset speed d1-01 to d1-17 1: Terminals - Analog input terminal A1 or A2 2: MEMOBUS/Modbus communications 3: Option PCB 4: Pulse Input (Terminal RP)	Default: 1 Range: 0 to 4 (Set to 3 for CompoNet only)
b1-02 (181) <1>	Run Command Selection	Selects the run command input source 0: Digital Operator - RUN and STOP keys 1: Digital input terminals S☐ 2: MEMOBUS/Modbus communications 3: Option PCB	Default: 1 Range: 0 to 3 (Set to 3 for CompoNet only)
F6-01 (3A2)	Operation Selection after Communications Error	Determines drive response when a bUS error is detected during communications with the option 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only <2>	Default: 1 Range: 0 to 3
F6-02 (3A3)	External Fault Detection Conditions (EF0)	Sets the condition for external fault detection (EF0) 0: Always detected 1: Detected only during operation	Default: 0 Range: 0, 1
F6-03 (3A4)	Stopping Method for External Fault from Communication Option	Determines drive response for external fault input (EF0) detection during CompoNet communication 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only <2>	Default: 1 Range: 0 to 3
F6-07 (3A8)	NetRef/ComRef Selection Function	0: Multi-step speed reference disabled 1: Multi-step speed reference allowed	Default: 1 Range: 0, 1
F6-08 (36A)	Reset Communication Related Parameters	Determines which F6-☐☐ and F7-☐☐ parameters are reset to default values when the drive is initialized using A1-03. 0: Do not reset parameters 1: Reset parameters	Default: 0 Range: 0, 1
F6-40 (3D5) <3>	MAC ID	Selects the drive MAC address **Note:** Used in the CompoNet Link Object	Default: 0 Min: 0 Max: 63

No. (Addr. Hex)	Name	Description	Values
F6-41 (3D6)	Baud Rate	CompoNet communication speed 0: 93.75 kbps 1: Detect automatically 2: 1.5 Mbps 3: 3 Mbps 4: 4 Mbps 5 to 255: Unused **Note:** Used in the CompoNet Link Object	Default: 1 Range: 0 to 4
F6-52 (3C3) <4>	PCA setting	I/O Polled Consuming Assembly data instance **Note:** Used in the Connection Object	Default: 21 Min: 0 Max: 255
F6-53 (3C4) <4>	PPA setting	I/O Polled Producing Assembly data instance **Note:** Used in the Connection Object	Default: 71 Min: 0 Max: 255
F6-56 (3D7)	Speed Scaling	Sets the scaling factor for the Speed Monitor in the CompoNet Object Class 2A hex **Note:** Used in the AC/DC Drive Object	Default: 0 Min: -15 Max: 15
F6-57 (3D8)	Current Scaling	Sets the scaling factor for the Output Current Monitor in the CompoNet Object Class 2A hex **Note:** Used in the AC/DC Drive Object	Default: 0 Min: -15 Max: 15
F6-58 (3D9)	Torque Scaling	Sets the scaling factor for the Torque Monitor in the CompoNet Object Class 2A hex **Note:** Used in the AC/DC Drive Object	Default: 0 Min: -15 Max: 15
F6-59 (3DA)	Power Scaling	Sets the scaling factor for the Power Monitor in the CompoNet Object Class 2A hex **Note:** Used in the AC/DC Drive Object	Default: 0 Min: -15 Max: 15
F6-60 (3DB)	Voltage Scaling	Sets the scaling factor for the Voltage Monitor in the CompoNet Object Class 2A **Note:** Used in the AC/DC Drive Object	Default: 0 Min: -15 Max: 15
F6-61 (3DC)	Time Scaling	Sets the scaling factor for the Time Monitor in the CompoNet Object Class 2A hex **Note:** Used in the AC/DC Drive Object	Default: 0 Min: -15 Max: 15
U6-80 (7B0)	MAC ID from Network	Actual MAC address **Note:** Used in the CompoNet Link Object	Min: 0 Max: 63
U6-81 (7B1)	Baud Rate from Network	CompoNet actual communication speed 0: 93.75 kbps 2: 1.5 Mbps 3: 3 Mbps 4: 4 Mbps **Note:** Used in the CompoNet Link Object	Default: 0 Range: 0 to 4
U6-82 ~ U6-99	Not Used	–	–

6 Related Parameters

<1> To start and stop the drive with the CompoNet master device using serial communications, set b1-02 to 3 or set the "Net Control" bit in the assemblies or Control Supervisor Object. To control the frequency reference of the drive via the master device, set b1-01 to 3 or set the "Net Reference" bit in the assemblies or AC/DC object.
<2> Setting F6-01 or F6-03 to 3 will allow the drive to continue to operate after detecting a fault. When allowing the drive to continue operation after fault detection, be sure to take proper safety measures such as installing an emergency stop switch.
<3> All MAC addresses must be unique.
<4> Unavailable values will initialize Polled Consuming Assembly (PCA) and Polled Producing Assembly (PPA).

7 Troubleshooting

◆ Drive-Side Error Codes

Table 10 lists the various option-related fault codes. Refer to the drive Technical Manual for further information about fault codes.

■ Faults

Both bUS (Option Communication Error) and EF0 (External Fault Input from the Option) can appear either as an alarm or as a fault. When a fault occurs, the digital operator ALM LED remains lit. When an alarm occurs, the digital operator ALM LED flashes.

Check the following items first when an error code occurs on the drive:

- Communication cable connections
- Make sure the option is properly installed to the drive
- Operation status of the master program and master CPU
- Did a momentary power loss interrupt communications?

Table 10 Fault Displays, Causes, and Possible Solutions

Digital Operator Display		Fault Name
bUS	bUS	Option Communication Error
		After establishing initial communication, the connection was lost. Only detected when the run command frequency reference is assigned to the option (bl-01 = 3 or bl-02 = 3).
Cause		**Possible Solution**
Master has stopped communicating.		Check for faulty wiring. Correct any wiring problems.
Communication cable is not connected properly.		
A data error occurred due to noise.		Check the various options available to minimize the effects of noise. Counteract noise in the control circuit wiring, main circuit lines, and ground wiring. If a magnetic contactor is the source of noise, install a surge absorber to the contactor coil. Make sure the cable used fulfills the CompoNet requirements.
Option is damaged.		If there are no problems with the wiring and the error continues to occur, replace the option.
Connection timeout		The option Expected Packet Rate (EPR) timer timed out. Make sure that EPR time is set properly.
Duplicate MAC ID		The option MAC ID and at least one other mode have the same MAC ID. Verify F6-40 is set properly.

Digital Operator Display		Fault Name
EF0	EF0	External Fault Input from the Option
		The alarm function for an external device has been triggered.
Cause		**Corrective Action**
An external fault is being sent from the master.		Remove the cause of the external fault. Reset the external fault input from the master device.
Problem with the master program.		Check the program used by the master and make the appropriate corrections.

Digital Operator Display		Fault Name
oFA00	oFA00	Option Fault
		Option is not properly connected.
Cause		**Possible Solution**
Non-compatible option connected to the drive.		Use only compatible options.

Digital Operator Display		Fault Name
oFA01	oFA01	Option Fault
		Option is not properly connected.
Cause		**Possible Solution**
Problem with the connector between the drive and option.		Turn the power off and check the connectors between the drive and option.

Digital Operator Display		Fault Name
oFA03	oFA03	Option Fault
		Option self-diagnostics error.
Cause		**Possible Solution**
Option hardware fault.		Replace the option.

Digital Operator Display		Fault Name
oFA04	oFA04	Option Fault
		Option Flash write mode
Cause		**Possible Solution**
Option hardware fault.		Replace the option.

Digital Operator Display		Fault Name
oFA30 to oFA43	oFA30 to oFA43	Option Fault (port A)
		Communication ID error
Cause		**Possible Solution**
Option hardware fault		Replace the option. Contact Yaskawa for assistance.

■ Minor Faults and Alarms

Digital Operator Display		Minor Fault Name	
AEr	AEr	MAC ID Setting Error	
		Option MAC ID is outside the acceptable setting range.	
Cause		**Possible Solutions**	**Minor Fault (H2-□□ = 10)**
MAC ID is set outside the possible setting range.		Reset the MAC ID in F6-40 to an allowable value.	Yes

Digital Operator Display		Fault Name	
CALL	CALL	Serial Communication Transmission Error	
		Communication has not yet been established.	
Cause		**Possible Solution**	**Minor Fault (H2-□□ = 10)**
Communication wiring or terminal resistor connection is faulty, there is a short circuit, or something is not connected properly.		Check for wiring errors. Correct the wiring. Remove and ground shorts and reconnect loose wires.	Yes
Master-side programming error		Check communications at start-up and correct programming errors.	
Damaged communication circuitry		Perform a self-diagnostics check. Replace the drive if the fault continues to occur.	

8 Configuring CompoNet Messaging

This section provides information on the various methods used to control the drive on CompoNet.

◆ Drive Configuration on CompoNet

■ Polled Configuration

Configure the drive CompoNet Polled connection before receiving commands from a Master device. The two parameters that must be configured are:

- F6-52: Polled Consuming Assembly (PCA)
  Note: Output assembly consumed by the drive.
- F6-53: Polled Producing Assembly (PPA)
  Note: Input assembly produced by the drive.

The default connection paths for the CompoNet Option are set for Extended Speed Control.

One each PCA and PPA assemblies from the ***Table 11*** must be selected to configure the drive for polled operation.

Table 11 Supported Polled Assemblies (PCA and PPA)

Assembly Number (decimal)	Description	Type	Bytes	Page
20	Basic Speed Control Output - 20 (0x14)	PCA	4	*36*
21	(Default Setting) Extended Speed Control Output - 21 (0x15)	PCA	4	*36*
22	Speed and Torque Control Output - 22 (0x16)	PCA	6	–
23	Extended Speed and Torque Control Output - 23 (0x17)	PCA	6	–
70	Basic Speed Control Input - 70 (0x46)	PPA	4	*36*
71	(Default Setting) Extended Speed Control Input - 71 (0x47)	PPA	4	*36*
72	Speed and Torque Control Input - 72 (0x48)	PPA	6	–
73	Extended Speed and Torque Control Input - 73 (0x49)	PPA	6	–
100	MEMOBUS/Modbus Message Command (Vendor Specific Yaskawa Electric (YE) Assy) - 100 (0x64)	PCA	6	–
101	Standard Control (Vendor Specific Yaskawa Electric (YE) Assy) - 101 (0x65)	PCA	8	–
102	Accel/Decel Time (Vendor Specific Yaskawa Electric (YE)Assy) - 102 (0x66)	PCA	8	–
106	Enhanced Control (Vendor Specific Yaskawa Electric (YE) Assy) - 106 (0x6A)	PCA	8	–
107	Standard DI/DO Control (Vendor Specific Yaskawa Electric (YE) Assy) - 107 (0x6B)	PCA	8	–

Assembly Number (decimal)	Description	Type	Bytes	Page
150	MEMOBUS/Modbus Message Reply (Vendor Specific Yaskawa Electric (YE) Assy) - 150 (0x96)	PPA	6	–
151	Standard Status (Vendor Specific Yaskawa Electric (YE) Assy) - 151 (0x97)	PPA	8	–
152	Standard Status 2 (Vendor Specific Yaskawa Electric (YE) Assy) -152 (0x98)	PPA	8	–
155	Enhanced Speed Status, Dynamic (Vendor Specific Yaskawa Electric (YE) Assy) - 155 (0x9B)	PPA	8	–
156	Enhanced Control Status (Vendor Specific Yaskawa Electric (YE) Assy) -156 (0x9C)	PPA	8	–
157	Standard DI/DO Status (Vendor Specific Yaskawa Electric (YE) Assy) - 157 (0x9D)	PPA	8	–

◆ Drive Operation on CompoNet

■ Polled Assemblies Quick Reference

Refer to the CompoNet Option SI-M3/V Technical Manual for details on polled assemblies and other message types.

Output Assemblies/Drive Consumes

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
20 CompoNet Basic Speed Control	0	-	-	-	-	-	Fault Reset	-	Run Fwd
	1	-							
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
21 CompoNet Extended Speed Control	0	-	Net Ref	Net Ctrl	-	-	Fault Reset	Run Rev	Run Fwd
	1	-							
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							

Input Assemblies/Drive Produces

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
70 CompoNet Basic Speed Control	0	-	-	-	-	-	Running 1	-	Faulted
	1	-							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
71 CompoNet Extended Speed Control	0	At Speed	Ref from Net	Ctrl from Net	Ready	Running 2 (REV)	Running 1 (FWD)	Warning	Faulted
	1	State							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							

9 Specifications

Table 12 Option Specifications

Item	Specification
Model	SI-M3/V (PCB model: SI-M3)
SI-M3/V Supported Messages	• Explicit Messages: Fragmentation is not supported. Up to 44 bytes can be input and output. • Polled I/O Messages: Fragmentation is not supported. Up to 8 bytes can be input and output.
I/O Assembly Instance	Input: 10 types (4~8 bytes) Output: 10 types (4~8 bytes)
CompoNet Specification	Word MIX slave
Profile	AC Drive
Input Power	Power is supplied from the drive.
Connector Type	4-pin open-style screw connector
Physical Layer Type	Isolated Physical Layer Pulse transfer
MAC ID Setting	Programmable from drive keypad: MAC ID 0 to 63
Communications Speed/Baud Rate	Programmable from drive keypad: 4 Mbps / 3 Mbps / 1.5 Mbps / 93.75 kbps
Ambient Temperature	–10 °C to +50 °C
Humidity	up to 95% RH (no condensation)
Storage Temperature	–20 °C to +60 °C (allowed for short-term transport of the product)
Area of Use	Indoor (free of corrosive gas, airborne particles, etc.)
Altitude	1000 m or lower

◆ Revision History

The revision dates and the numbers of the revised manuals appear on the bottom of the back cover.

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YASKAWA AC Drive-V1000 Option

CompoNet

Installation Manual

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