

## YASKAWA AC Drive 1000-Series Option

# PROFIBUS-DP

## Installation Manual

Type: SI-P3/V, SI-P3/T

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

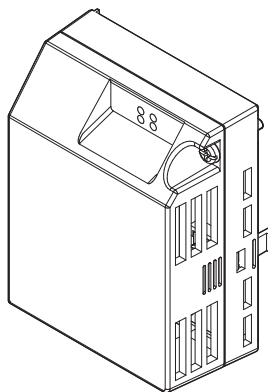
## 安川インバータ1000シリーズオプション

# PROFIBUS-DP通信

## 取扱説明書

形 式 SI-P3/V, SI-P3/T

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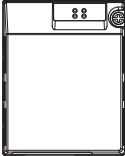
# 1 Preface and Safety

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, EXPRESS 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 PROFIBUS-DP Option:

### Option Unit


	<b>Yaskawa AC Drive 1000-Series Option PROFIBUS-DP Installation Manual Manual No.: TOBP C730600 23 (this book)</b>	<p>Read this manual first.</p> <p>The installation manual is packaged with the PROFIBUS-DP Option and contains a basic overview of wiring, settings, functions, and fault diagnoses.</p>
	<b>Yaskawa AC Drive 1000-Series Option PROFIBUS-DP Technical Manual Manual No.: SIEP C730600 23</b>	<p>The technical manual contains detailed information and command registers.</p> <p>To obtain the technical manual access these sites:            U.S.: <a href="http://www.yaskawa.com">http://www.yaskawa.com</a>            Europe: <a href="http://www.yaskawa.eu.com">http://www.yaskawa.eu.com</a>            Japan: <a href="http://www.e-mechatronics.com">http://www.e-mechatronics.com</a>            Other areas: contact a Yaskawa representative.</p>

# 1 Preface and Safety

## Yaskawa Drive (V1000)

	<b>Yaskawa AC Drive-V1000 Technical Manual</b>	To obtain instruction manuals for Yaskawa products access these sites: U.S.: <a href="http://www.yaskawa.com">http://www.yaskawa.com</a> Europe: <a href="http://www.yaskawa.eu.com">http://www.yaskawa.eu.com</a> Japan: <a href="http://www.e-mechatronics.com">http://www.e-mechatronics.com</a> Other areas: contact a Yaskawa representative.
	<b>Yaskawa AC Drive-V1000 Quick Start Guide</b>	For questions, contact the local Yaskawa sales office or the nearest Yaskawa representative.

## Yaskawa Drive (T1000V)

	<b>Yaskawa AC Drive-T1000V Technical Manual</b>	This manual describes installation, wiring, operation procedures, functions, troubleshooting, maintenance, and inspections to perform before operation. To obtain this manual, contact the local Yaskawa sales office or the nearest Yaskawa representative.
	<b>Yaskawa AC Drive-T1000V Safety Precautions</b>	This guide is packaged together with the product. Covers safety precautions, areas to check upon receiving your new T1000V, and standards compliance.

## ◆ Terms

- Note:** Indicates supplemental information that is not related to safety messages.
- Drive:**
- Yaskawa AC Drive-V1000 Series
  - Yaskawa AC Drive-T1000V Series
- PROFIBUS-DP Option:** Yaskawa AC Drive 1000-Series Option PROFIBUS-DP (SI-P3/V, SI-P3/T)

## ◆ Registered Trademarks

- PROFIBUS-DP is a registered trademark of PROFIBUS and PROFINET International.
- Other company names and product names listed in this manual are registered trademarks of those companies.

## ◆ Supplemental Safety Information

Read and understand this manual before installing, operating, or servicing this option unit. The option unit must be installed according to this manual and local codes.

The following conventions are used to indicate safety messages in this manual. Failure to heed these messages could result in serious or possibly even fatal injury or damage to the products or to 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.

# 1 Preface and Safety

---

## ■ General Safety

### General Precautions

- The diagrams in this section may include option units and drives without covers or safety shields to illustrate details. Be sure to reinstall covers or shields before operating any devices. The option board should be used 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 a new copy of the manual due to damage or loss, contact your 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 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.

#### **Do not expose the drive to halogen group disinfectants.**

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

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.



## ■ Option Unit Label Warnings

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 sticker is provided with the PROFIBUS-DP Option. This sticker can be placed over the English and French warnings on the front of the PROFIBUS-DP Option.

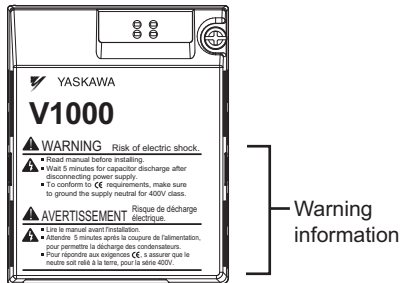








Figure 1 Warning Labels (example: SI-P3/V)

## ■ 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 Overview

PROFIBUS is an open digital communication system supporting a wide range of fast, time-critical applications.

PROFIBUS-DP (Decentralized Periphery) is one of the three PROFIBUS variants. DP is dedicated to fast data communication between systems and peripherals at a field level. This PROFIBUS-DP Option connects a drive to a field network using the PROFIBUS-DP protocol.

PROFIBUS-DP is included into the European Fieldbus Standard EN 50170.

The network is primarily used in process and factory automation.

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

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

### ◆ Compatible Products

The PROFIBUS-DP Option can be used with the products in [Table 1](#).

**Table 1 Compatible Products**

Option Unit	Model(s)	Software Version <1>
SI-P3/V	CIMR-V□□A□□□□□A□	≥ 1010
SI-P3/T	CIMR-T□□V□□□□□□□	6000 and later

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

**Note:** For Yaskawa customers in the North or South America region:  
If your product is not listed in [Table 1](#), refer to the web page below to confirm this manual is correct for your product. The web page provides a list of option manuals by product, and a direct link to download a PDF.

Scan QR code



Or refer to: <http://www.yaskawa.com/optionlookup>

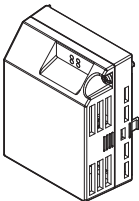
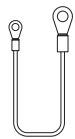
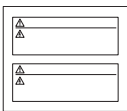
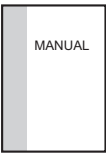
## 3 Receiving

Please perform the following tasks after receiving the PROFIBUS-DP Option:

- Inspect the PROFIBUS-DP Option for damage.  
If the PROFIBUS-DP Option appears damaged upon receipt, contact the shipper immediately.
- Verify receipt of the correct model by checking the information on the nameplate (see [Figure 2](#)).
- If you receive the wrong model or the PROFIBUS-DP Option does not function properly, contact your supplier.

### ◆ Contents and Packaging

Table 2 Contents of Package

Description:	Option Unit	Ground Cables	Warning Labels	Installation Manual (This book)
				
<b>Quantity:</b>	1	4	1	1

### ◆ Tool Requirements

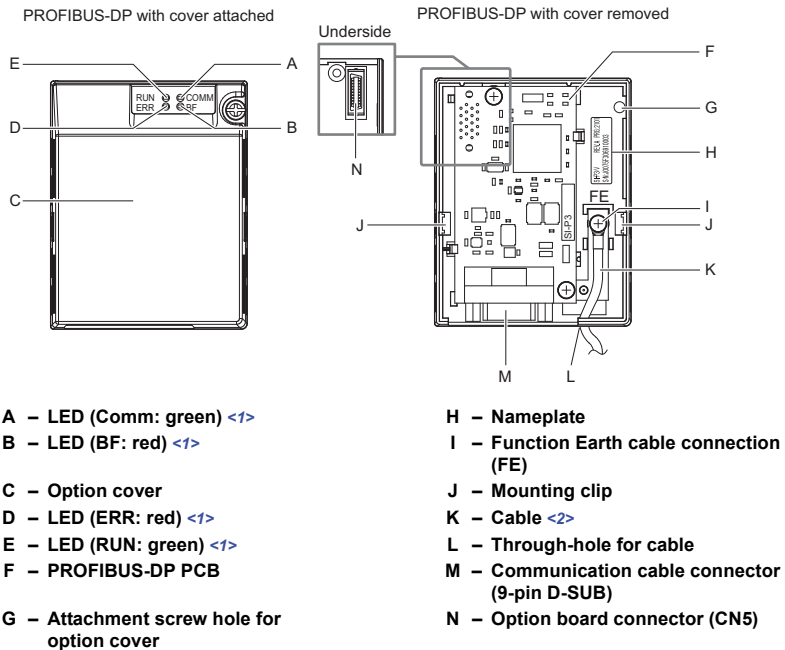
A Phillips screwdriver (M3, M3.5 to M6 <1> metric or (#1, #2 <1>) U.S. standard size is required to install the PROFIBUS-DP Option.

<1> Screw sizes vary by drive capacity. Select a screwdriver that matches the drive capacity.

**Note:** Tools required to prepare PROFIBUS cables for wiring are not listed in this manual.

# 4 PROFIBUS-DP Option Components

### ◆ PROFIBUS-DP Option



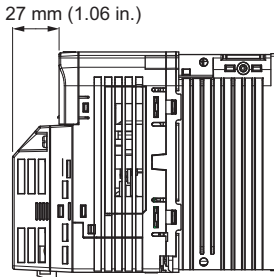
<1> For details on the LEDs, refer to *PROFIBUS-DP Option LED Display on page 15* and *Understanding LED Display on page 15*.

<2> Cables are not connected to the PROFIBUS-DP Option and are packaged separately in the box.

Figure 2 Option Unit

### ◆ Dimensions

The installed PROFIBUS-DP Option adds 27 mm (1.06 in.) to the total depth of the drive. (*Figure 3*)



**Figure 3 Dimensions**

## 4 PROFIBUS-DP Option Components

### ◆ Communication connector

The drive has a 9 pin D-sub connector for installing the option card. Once installed, the drive can connect to a PROFIBUS network.

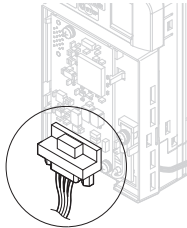


Figure 4 Communication Connector Location

Table 3 Communication Connector (9-pin D-SUB)

PROFIBUS Connector	Pin	Signal	Description
Bottom View 	1	Shield	Connected to the metal-shell (no direct FG-connection)
	2	–	–
	3	RxD/TxD-P	Receive/Transmit data; line B (red)
	4	CNTR-P	Control signal for repeaters (direction control)
	5	DGND	Data ground (reference voltage to VP)
	6	VP	Power supply output for bus termination (for termination resistor)
	7	–	–
	8	RxD/TxD-N	Receive/Transmit data; line A (green)
	9	–	–

### ◆ PROFIBUS-DP Option LED Display

**Table 4 LED Display**

LED	Display		Communication Status	Meaning
	Color	Status		
RUN (Power)	Green	ON	Power is on	Power is being properly supplied to PROFIBUS-DP Option, and PROFIBUS-DP Option has completed its hardware self-diagnostics check
		OFF	Power is off	<ul style="list-style-type: none"> <li>• The drive has no power supply</li> <li>• PROFIBUS-DP Option and drive are not connected properly and/or there is no power supplied to the PROFIBUS-DP Option</li> <li>• An internal, self-diagnostic error occurred in the PROFIBUS-DP Option</li> </ul>
ERR (Option Error)	Red	ON	PROFIBUS-DP Option error	Self-diagnostics error occurred in the PROFIBUS-DP Option
		Flashing	Drive connection error	Connection error between PROFIBUS-DP Option and drive. This includes node address setting errors to parameter F6-30 on the drive side
		OFF	Normal operation	Drive and PROFIBUS-DP Option are properly connected
COMM (Communication Status)	Green	ON	Communication connected	Normal send/receive between PROFIBUS-DP Option and PROFIBUS-DP master
		OFF	No data exchange	There is a problem establishing communication between PROFIBUS-DP Option and the PROFIBUS-DP master
BF (PROFIBUS-DP Error)	Red	ON	Waiting for communication procedure setting	Communication-related parameters are being set or initialized by the PROFIBUS-DP master.
		Flashing	Communication setting error	Communication parameter error from PROFIBUS-DP master
		OFF	Normal operation	LED is off once the PROFIBUS-DP master is finished setting communication-related parameters

**Table 5 Understanding LED Display**

LED				Communication Status	Possible Cause	Solution
RUN	ERR	COMM	BF			
●	●	●	●	No power	The drive has no power	<ul style="list-style-type: none"> <li>• Shut the drive off and check that the PROFIBUS-DP Option is properly connected</li> <li>• Turn the power back on again</li> </ul>
					PROFIBUS-DP Option is not properly connected to the drive, and therefore is not receiving enough power	

## 4 PROFIBUS-DP Option Components

LED				Communication Status	Possible Cause	Solution
RUN	ERR	COMM	BF			
○	●	●	●	<ul style="list-style-type: none"> <li>Checking connection with the drive</li> <li>Waiting for data from the master</li> </ul>	<ul style="list-style-type: none"> <li>PROFIBUS-DP Option is reading the node address or parameter configuration</li> <li>Waiting for initial input data from master device</li> </ul>	—
●	○	●	●	PROFIBUS-DP Option Self-diagnostics error	The PROFIBUS-DP Option is damaged	Cycle power to the drive. If the LED status does not change, replace the PROFIBUS-DP Option
●	◐	●	●	Problem connecting to the drive	<ul style="list-style-type: none"> <li>Problem initializing the drive and PROFIBUS-DP Option</li> <li>Incorrect node address</li> </ul>	<ul style="list-style-type: none"> <li>Cycle power to the drive. If the LED status does not change, replace the PROFIBUS-DP Option</li> <li>Check the node address setting in the drive (parameter F6-10)</li> </ul>
○	●	●	○	Waiting for data from the master device	Waiting for data from the master device (Set_Parm_Message or Chk_Cfg_Message)	<ul style="list-style-type: none"> <li>Check the network settings in the master</li> <li>Make sure the master device is operating normally</li> <li>Check the terminal resistance settings on the data line</li> <li>Look for any problems with the data line, or if the connector</li> <li>Check that the data lines are properly connected to the drive</li> </ul>
○	●	●	◐	Data is incorrect or PROFIBUS-DP Option timed out waiting for data	The communication procedure in the master is set incorrectly	Check the communication procedure settings in the master
○	●	○	●	Sending or receiving data	—	—

○: On / ◐ : Flashing / ●: Off

### ◆ Setting Node Address

Set drive parameter F6-30 to a unique node address (range 0 to 125) on the network.



## 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 to prevent electric shock. 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.

#### WARNING

##### **Electrical Shock Hazard**

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

Failure to comply could result in death or serious injury.

The diagrams in this section may include option units and drives without covers or safety shields to show details. Be sure to reinstall covers or shields before operating any devices. The option board should be used 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 use damaged wires, place excessive stress on wiring, or damage the wire insulation.**

Failure to comply could result in death or serious injury.

### NOTICE

#### Damage to Equipment

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

Failure to comply may result in ESD damage to circuitry.

**Never shut the power off while the drive is 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 unit and connecting any other devices.**

Failure to comply may result in damage to the option unit.

---

#### ◆ 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.

**DANGER!** *Electrical Shock Hazard. Do not connect or disconnect wiring while the power is on. Failure to comply could 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.*

1. Shut off power to the drive, wait at least five minutes after confirming the DC bus voltage is safe, 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.

**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.*

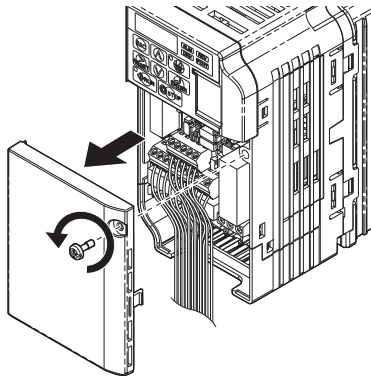


Figure 5 Remove Front Cover

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.

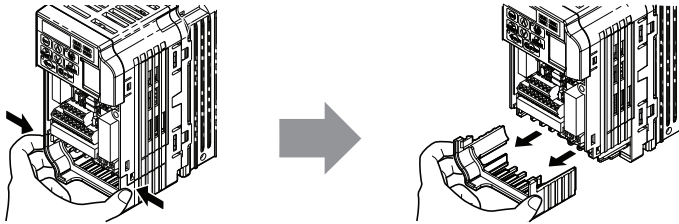
Table 6 Installation Steps Based on Drive Model

Enclosure Type	Drive Model	Proceed to Step	Page
IP20/Open-Chassis	CIMR-V□□A□□□□B	3.	20
IP20/NEMA Type 1 <I>	CIMR-V□□A□□□□F	6.	22

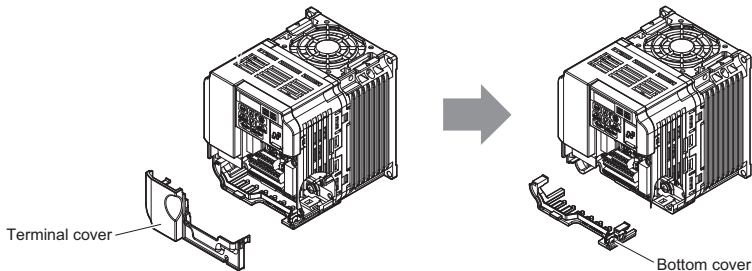
<I> Installing the option on an IP20/NEMA Type 1 enclosure drive voids NEMA Type 1 protection while maintaining IP20 conformity.

## 5 Installation Procedure

- 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 6](#) for details. Refer to [Figure 7](#) 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.



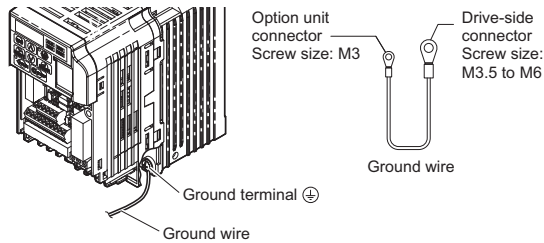
**Figure 6 Remove the Bottom Cover on an IP20/Open-Chassis Drive (Models CIMR-V□BA0001B to BA0003B and 2A0001B to 2A0006B)**



**Figure 7 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. Refer to [Table 7](#) on page [21](#) for ground wire selection by drive model.



**Figure 8** Connect the Ground Wire on an IP20/Open-Chassis Drive

**Table 7** Ground Wire Selection

Ground Wire Length mm (in)	Drive Model CIMR-V□		
	Single-Phase 200 V Class	Three-Phase 200 V Class	Three-Phase 400 V Class
150 (5.9)	BA0001 BA0002 BA0003	2A0001 2A0002 2A0004 2A0006	—
200 (7.9)	BA0006 BA0010 BA0012 BA0018	2A0010 2A0012 2A0020	4A0001 4A0002 4A0004 4A0005 4A0007 4A0009 4A0011
250 (9.8)	—	2A0030 2A0040	4A0018 4A0023
400 (15.7)	—	2A0056 2A0069	4A0031 4A0038

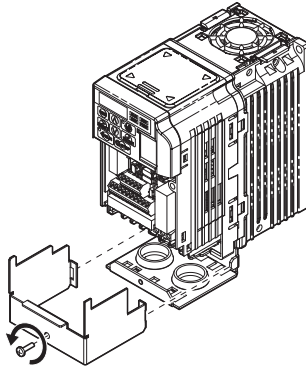
- 5.** For IP20/Open-Chassis models, go to Step [9.](#) on page [24.](#)

## 5 Installation Procedure

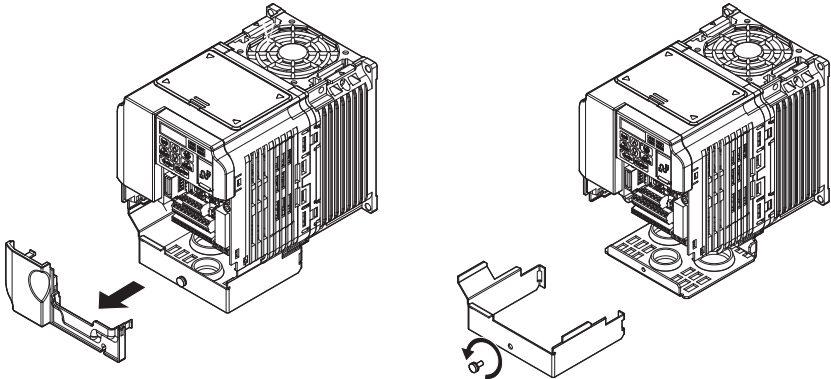
6. For IP20/NEMA Type 1 enclosure models CIMR-V□□A□□□□F, loosen the screw on the front of the NEMA Type 1 terminal cover and remove it from the drive. Refer to [Figure 9](#) for details.

Refer to [Figure 10](#) 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 the 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 9 Remove the NEMA Type 1 Terminal Cover  
(Models CIMR-V□BA0001F to BA0003F, 2A0001F to 2A0006F)**



**Figure 10 Remove the Terminal Cover on an IP20/NEMA Type 1 Drive  
(Models CIMR-V□BA0006F to BA0018F; 2A0008F to 2A0069F; 4A0001F to 4A0038F)**

- 7. For models CIMR-V□BA0001F to BA0003F, 2A0001F to 2A0006F, loosen the screws attaching the NEMA Type 1 conduit bracket to the drive to remove the NEMA Type 1 conduit bracket.

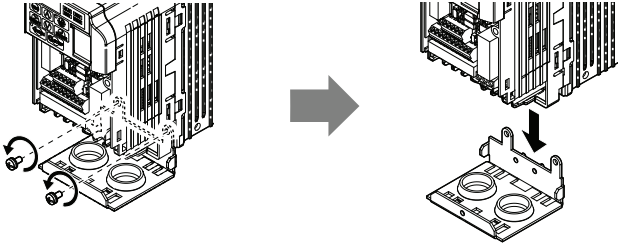


Figure 11 Remove the NEMA Type 1 Conduit Bracket

- 8. On NEMA Type 1 enclosure models (CIMR-V□BA0001F to BA0003F, 2A0001F to 2A0006F), 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 12 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. Refer to Table 7 on page 21 for ground wire selection by drive model.

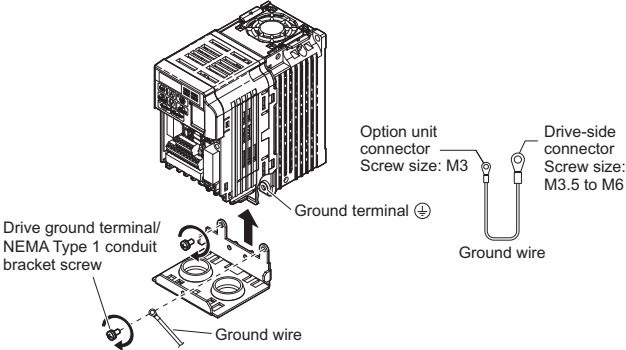
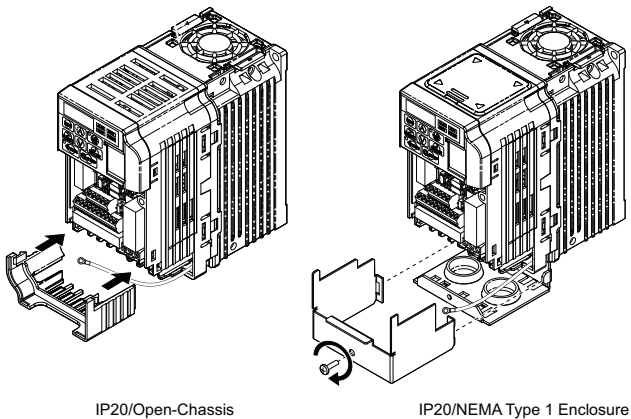


Figure 12 Reattach the NEMA Type 1 Conduit Bracket and Connect the Ground Wire for models CIMR-V□BA0001F to BA0003F, 2A0001F to 2A0006F

## 5 Installation Procedure

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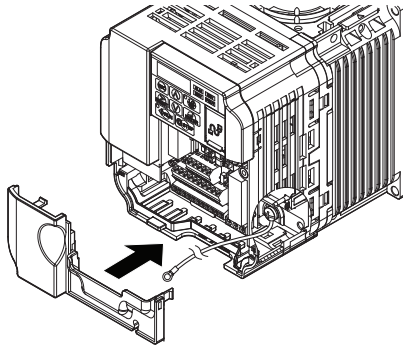
9. Reattach the bottom cover. Keep the ground wire inside of the bottom cover when reattaching.



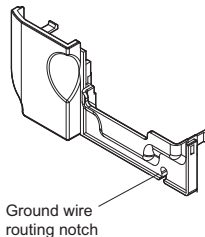
**Figure 13 Reattach the Bottom Cover**



- 10.** On models CIMR-V□BA0006□ to BA0018□, 2A0008□ to 2A0069□, and 4A0001□ to 4A0038□, reattach the terminal cover. Refer to [Figure 14](#) and [Figure 15](#) 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.



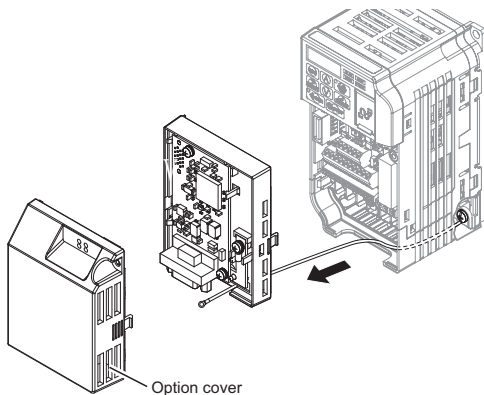
**Figure 14 Reattach the Terminal Cover**  
(Models CIMR-V□BA0006□ to BA0018□; 2A0008□ to 2A0069□; 4A0001□ to 4A0038□)



**Figure 15 Terminal Cover Ground Wire Notch**  
(Models CIMR-V□BA0006□ to BA0018□; 2A0008□ to 2A0020□; 4A0001□ to 4A0011□)

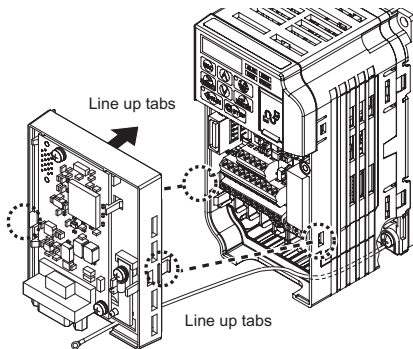
## 5 Installation Procedure

11. Remove the option cover and 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.



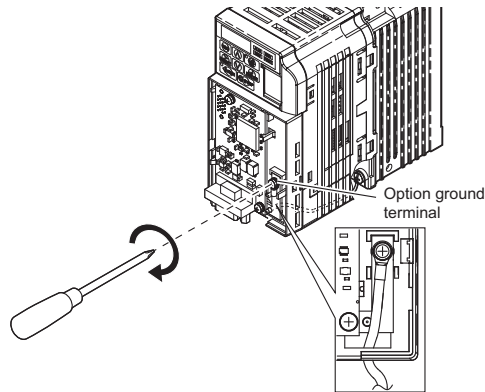
**Figure 16 Ground Wire Routing**

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 17 Connect the Option**

- 13.** Connect the ground wire at the option ground terminal. Tighten the screw to 0.5 to 0.6 N·m or (4.4 to 5.3 in lbs) using an M3 Phillips screwdriver.



**Figure 18** Connect the Ground Wire to the Option

- 14.** Select proper PROFIBUS-DP cables.

### Communication Cable Specifications

To ensure proper performance, Yaskawa recommends using PROFIBUS-DP-dedicated cables. Refer to the PROFIBUS-DP website at [www.profibus.com](http://www.profibus.com) for more information on cables.

Yaskawa recommends using PROFIBUS-DP cables suitable for the conditions listed in [Table 8](#) and [Table 9](#).

**Table 8** Communication Cable Requirements

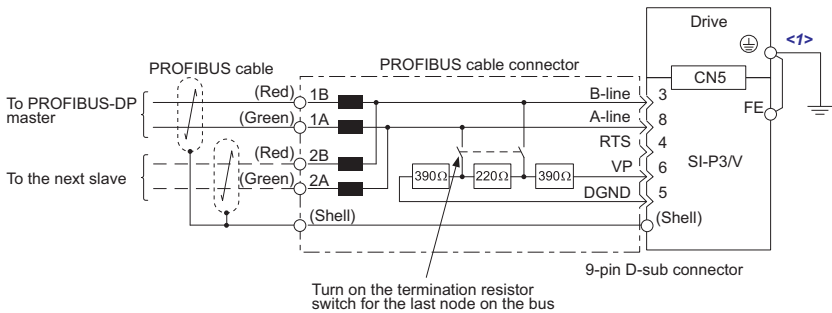
Condition	Specifications
Impedance	135 to 165 $\Omega$ at a frequency of (3 to 20 MHz)
Capacity	30 pF/m maximum
Loop Resistance	110 $\Omega$ /km maximum
Core Cross-Section	0.34 mm <sup>2</sup> minimum
Core Diameter	0.64 mm minimum

## 5 Installation Procedure

**Table 9 Communication Cable Length**

Communication Speed (kbps)	Distance per Segment
9.6	1200 m (3937 ft.)
19.2	1200 m (3937 ft.)
45.45	1200 m (3937 ft.)
93.75	1200 m (3937 ft.)
187.5	1000 m (3280 ft.)
500	400 m (1312 ft.)
1500	200 m (656 ft.)
3000	100 m (328 ft.)
6000	100 m (328 ft.)
12000	100 m (328 ft.)

### Connection Diagram



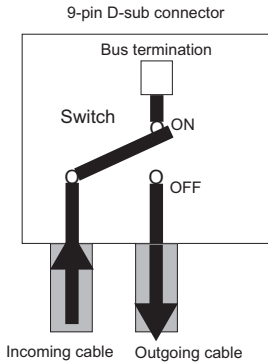
**Figure 19 Option Connection Diagram**

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

### PROFIBUS-DP Termination

The option does not have a built-in termination resistor. The termination resistance must be set on the final drive in the network using a switch on the 9-pin D-sub connector. Make sure that only the connector for the final drive in the network has a termination resistor; communication problems may arise if any other network drive has a termination resistor.

Use only the input side cable entry as shown in [Figure 20](#) when connecting both ends of the network. Most 9-pin D-sub connectors have a function for disconnecting the output side of the cable. Communication will not be possible between devices if the connector is reversed. Most connectors have arrows indicating the input and output sides.



**Figure 20 PROFIBUS Cable Connection with Termination Resistors**

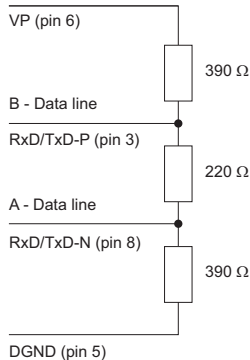
**Bus termination ON** = incoming and outgoing cables not connected.

**Bus termination OFF** = incoming and outgoing cables connected.

## 5 Installation Procedure

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Termination resistors without inductors as shown in [Figure 21](#) can only be used for baud rates below 1.5 Mbps. Baud rates 1.5 Mbps and higher require termination with resistors and inductors as shown in [Figure 19](#).



**Figure 21 Cable Termination of the Option Cable to EN50170  
(Pin Numbers for a 9-pin D-sub Connector)**

- 15.** To connect the option to a network, firmly connect RJ45 8-pin Shielded Twisted Pair Cat5e cable(s) into the modular connector port.
- Note:** Do not connect or disconnect the communication cable while the drive is powered up or while the drive is in operation. Failure to comply may cause a static discharge, which will cause the option card to stop working properly. Cycle power on the drive and option card to reestablish functionality.
- 16.** After connecting the prepared cable for the 9-pin D-sub communication connector CN5, recheck the option wire routing performed in step [14](#).
  - 17.** Set drive parameters in [Table 8](#) for proper option performance. Be sure to set parameter F6-30 to a node address unique to the network.

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### ◆ GSD Files

For easy network implementation of drives equipped with a PROFIBUS-DP Option, a GSD file can be obtained from:

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

Europe: <http://www.yaskawa.eu.com>

Japan: <http://www.e-mechatronics.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 all parameters in [Table 10](#) before starting network communications.

**Table 10 Related Parameters**

No. (Addr. Hex)	Name	Description	Values
b1-01 (180) <I>	Frequency Reference Selection 1	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 4: Pulse Input (Terminal RP)	Default: 1 Range: 0 to 4 (Set to 3 for SI-P3)
b1-02 (181) <I>	Run Command Selection 1	Selects the run command input source. 0: Digital Operator - RUN and STOP keys 1: Digital input terminals S□ 2: MEMOBUS/Modbus communications 3: Option	Default: 1 Range: 0 to 3 (Set to 3 for SI-P3)
F6-01 (3A2)	Communications Error Operation Selection	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 <I> 4: Alarm and Run at d1-04 <I> <I> <I> 5: Alarm and Ramp to stop <I> <I>	Default: 1 Range: 0 to 5
F6-02 (3A3)	External Fault from Comm. Option Detection Selection	Sets the condition for external fault detection (EF0). 0: Always detected 1: Detected only during operation	Default: 0 Range: 0, 1
F6-03 (3A4)	External Fault from Comm. Option Operation Selection	Determines drive response for external fault input (EF0) detection during PROFIBUS communication. 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only <I>	Default: 1 Range: 0 to 3
F6-07 (3A8)	Multi-Step Speed Enable/Disable Selection when NefRef/ComRef is Selected	0: Multi-step speed reference disabled (F7 functionality) 1: Multi-step speed reference allowed (V7 functionality)	Default: 0 Range: 0, 1

## 6 Related Parameters

No. (Addr. Hex)	Name	Description	Values
F6-08 (36A)	Reset Communication Parameters	Determines which F6-□□ and F7-□□ parameters are reset to default values when initializing the drive using A1-03. 0: Do not reset parameters 1: Reset parameters <b>Note:</b> Setting this parameter does not affect communication-related parameters. Setting this parameter only determines if communication-related parameters (F6-□□ and F7-□□) are also reset when initializing with A1-03.	Default: 0 Range: 0, 1
F6-14 (3BB) <3> <5>	bUS Error Auto Reset	Enables or disables the bUS Error Auto Reset. 0: Disabled 1: Enabled	Default: 0 Range: 0, 1
F6-30 (3CB) <6> <7>	PROFIBUS-DP Node Address	Sets the node address.	Default: 0 Min: 0 Max: 125
F6-31 (3CC)	PROFIBUS-DP Clear Mode Selection	Selects the action to take when a “Clear Mode” command is received. 0: Resets to 0 1: Maintains the previous value	Default: 0 Range: 0, 1
F6-32 (3CD) <5> <7>	PROFIBUS-DP Data Format Selection	0: PPO Type 1: Conventional 2: PPO (w/bit 0) <3> <8> 3: PPO Type (Auto Enter) <3> <9> 4: Conventional (Auto Enter) <3> <9> 5: PPO (w/bit0, Auto Enter) <3> <8> <9>	Default: 0 Range: 0 to 5
F7-16 (3F4) <3> <5>	Communication Loss Time-out	Sets the time-out value for communication loss detection in tenths of a second. A value of 0 disables the connection time-out. Example: An entered value of 100 represents 10.0 seconds.	Default: 0.0 Min: 0.0 Max: 30.0
F7-60 (780) <3> <5>	PZD1 Write	Sets MEMOBUS/Modbus address for PZD1 Write (PPO Write). The value of 0 to 2 enables the PZD1 Write as STW.	Default: 0H Min: 0H Max: FFFFH
F7-61 (781) <3> <5>	PZD2 Write	Sets MEMOBUS/Modbus address for PZD2 Write (PPO Write). The value of 0 to 2 enables the PZD2 Write as HSW.	Default: 0H Min: 0H Max: FFFFH
F7-62 (780) <3> <5>	PZD3 Write	Sets MEMOBUS/Modbus address for PZD3 Write (PPO Write). The value of 0 to 2 disables the PZD3 Write.	Default: 0H Min: 0H Max: FFFFH
F7-63 (783) <3> <5>	PZD4 Write	Sets MEMOBUS/Modbus address for PZD4 Write (PPO Write). The value of 0 to 2 disables the PZD4 Write.	Default: 0H Min: 0H Max: FFFFH
F7-64 (784) <3> <5>	PZD5 Write	Sets MEMOBUS/Modbus address for PZD5 Write (PPO Write). The value of 0 to 2 disables the PZD5 Write.	Default: 0H Min: 0H Max: FFFFH



## 6 Related Parameters

No. (Addr. Hex)	Name	Description	Values
F7-65 (785) <> <>	PZD6 Write	Sets MEMOBUS/Modbus address for PZD6 Write (PPO Write). The value of 0 to 2 disables the PZD6 Write.	Default: 0H Min: 0H Max: FFFFH
F7-66 (786) <> <>	PZD7 Write	Sets MEMOBUS/Modbus address for PZD7 Write (PPO Write). The value of 0 to 2 disables the PZD7 Write.	Default: 0H Min: 0H Max: FFFFH
F7-67 (787) <> <>	PZD8 Write	Sets MEMOBUS/Modbus address for PZD8 Write (PPO Write). The value of 0 to 2 disables the PZD8 Write.	Default: 0H Min: 0H Max: FFFFH
F7-68 (788) <> <>	PZD9 Write	Sets MEMOBUS/Modbus address for PZD9 Write (PPO Write). The value of 0 to 2 disables the PZD9 Write.	Default: 0H Min: 0H Max: FFFFH
F7-69 (789) <> <>	PZD10 Write	Sets MEMOBUS/Modbus address for PZD10 Write (PPO Write). The value of 0 to 2 disables the PZD10 Write.	Default: 0H Min: 0H Max: FFFFH
F7-70 (78A) <> <>	PZD1 Read	Sets MEMOBUS/Modbus address for PZD1 Read (PPO Read). The value of 0 to 2 enables the PZD1 Read as ZSW.	Default: 0H Min: 0H Max: FFFFH
F7-71 (78B) <> <>	PZD2 Read	Sets MEMOBUS/Modbus address for PZD2 Read (PPO Read). The value of 0 to 2 enables the PZD2 Read as HIW.	Default: 0H Min: 0H Max: FFFFH
F7-72 (78C) <> <>	PZD3 Read	Sets MEMOBUS/Modbus address for PZD3 Read (PPO Read). The value of 0 to 2 disables the PZD3 Read.	Default: 0H Min: 0H Max: FFFFH
F7-73 (78D) <> <>	PZD4 Read	Sets MEMOBUS/Modbus address for PZD4 Read (PPO Read). The value of 0 to 2 disables the PZD4 Read.	Default: 0H Min: 0H Max: FFFFH
F7-74 (78E) <> <>	PZD5 Read	Sets MEMOBUS/Modbus address for PZD5 Read (PPO Read). The value of 0 to 2 disables the PZD5 Read.	Default: 0H Min: 0H Max: FFFFH
F7-75 (78F) <> <>	PZD6 Read	Sets MEMOBUS/Modbus address for PZD6 Read (PPO Read). The value of 0 to 2 disables the PZD6 Read.	Default: 0H Min: 0H Max: FFFFH
F7-76 (790) <> <>	PZD7 Read	Sets MEMOBUS/Modbus address for PZD7 Read (PPO Read). The value of 0 to 2 disables the PZD7 Read.	Default: 0H Min: 0H Max: FFFFH
F7-77 (791) <> <>	PZD8 Read	Sets MEMOBUS/Modbus address for PZD8 Read (PPO Read). The value of 0 to 2 disables the PZD8 Read.	Default: 0H Min: 0H Max: FFFFH
F7-78 (792) <> <>	PZD9 Read	Sets MEMOBUS/Modbus address for PZD9 Read (PPO Read). The value of 0 to 2 disables the PZD9 Read.	Default: 0H Min: 0H Max: FFFFH

## 6 Related Parameters

No. (Addr. Hex)	Name	Description	Values
F7-79 (793) <3> <5>	PZD10 Read	Sets MEMOBUS/Modbus address for PZD10 Read (PPO Read). The value of 0 to 2 disables the PZD10 Read.	Default: 0H Min: 0H Max: FFFFH

- <1> Set b1-02 to 3 to start and stop the drive through the PROFIBUS-DP network. Set b1-01 to 3 to control the frequency reference of the drive via the PROFIBUS-DP network.
- <2> Take proper safety measures, such as installing an emergency stop switch, when setting F6-03 to 3 or 4, as the drive will continue operation when detecting a fault.
- <3> Available in the V1000 software versions PRG: 1024 and later.
- <4> Refer to the instruction manual of a specific drive to determine if settings 4 and 5 are available in the drive.
- <5> Available in the option software versions PRG: 2103 and later.
- <6> All node addresses must be unique. Node addresses 0, 1, and 2 are typically reserved for control, maintenance, and diagnostic equipment. The "Err" LED will illuminate when a value of 0 or a value greater than 125 is entered.
- <7> Cycle power for setting changes to take effect.
- <8> Requires also setting bit 0 to 4 to issue Run command. Refer to the option Technical Manual for more information.
- <9> When writing this parameter to the drive through the PROFIBUS-DP network, the parameter is validated by automatically executing the Enter command.

## 7 PROFIBUS-DP Option Data and I/O Maps

### ◆ Conventional Formats

The configuration tool of PROFIBUS-DP master sets the input and output data length of PROFIBUS-DP Option from Extended Data 1 (32 bytes), Extended Data 2 (12 bytes), and Basic Data (6 bytes).

Conventional formats have two message types: High-speed I/O Data and MEMOBUS/Modbus message.

Set parameter F6-32 to “1” to use conventional formats.

### ■ High-Speed I/O Data

High-speed I/O data is directly transferred to or from the drive and can control the drive. For example, when the drive is set for PROFIBUS-DP communications, the drive Run/Stop and Frequency Reference commands are typically transferred to the drive within 2 ms after being received by the option.

### ■ MEMOBUS/Modbus Message

MEMOBUS/Modbus message data is transferred to the drive using MEMOBUS/Modbus messages. All drive parameters and data can be accessed through MEMOBUS/Modbus. Because the data in this message type is transferred to the drive after the PROFIBUS-DP Option receives and edits it, more time is required to return the data to the master. The master must synchronize the timing of sending and receiving the data by handshaking.

### ■ Memory Maps

The following memory maps show the I/O data bytes.

### ■ Basic and Extended Register Maps

–	Basic Data (6 bytes)	Extended Data 1 (32 bytes)	Extended Data 2 (12 bytes)
High-speed I/O Data	Bytes 0 to 5	Bytes 0 to 15	Bytes 0 to 3
MEMOBUS/Modbus Data	–	Bytes 16 to 31	Bytes 4 to 11

## 7 PROFIBUS-DP Option Data and I/O Maps

**Table 11 Basic Data Register Map Detail**

Output (Master Device to Drive)		Input (Drive to Master Device)	
Byte	Description	Byte	Description
0	Operation Command (High Byte)	0	Drive Status (High Byte)
1	Operation Command (Low Byte)	1	Drive Status (Low Byte)
2	Frequency Reference (High Byte)	2	Motor Speed (High Byte) <1>
3	Frequency Reference (Low Byte)	3	Motor Speed (Low Byte) <1>
4	Reserved	4	Output Current (High Byte) <2>
5		5	Output Current (Low Byte) <2>

<1> Unit depends on the setting of o1-03 (Digital Operator Display Scaling). When the drive is operating in the V/f Control mode, the drive's output frequency becomes the input data.

<2> Data is displayed in units of either 0.01 A for drives 7.5 kW and smaller, or in units of 0.1 A for drives 11 kW and larger. This is the same regardless of whether the drive is set for Normal Duty or Heavy Duty operation.

**Table 12 Extended Data 1 Register Map**

Output (Master Device to Drive)		Input (Drive to Master Device)	
Byte	Description	Byte	Description
0	Operation Command (High Byte)	0	Drive Status (High Byte)
1	Operation Command (Low Byte)	1	Drive Status (Low Byte)
2	Frequency Reference (High Byte)	2	Motor Speed (High Byte) <3>
3	Frequency Reference (Low Byte)	3	Motor Speed (Low Byte) <3>
4	Reserved	4	Torque Reference Monitor (High Byte) <4>
5		5	Torque Reference Monitor (Low Byte) <4>
6		6	Reserved
7		7	
8		8	Frequency Reference (High Byte)
9		9	Frequency Reference (Low Byte)
10	Analog Output Channel 1 (High Byte) <1>	10	Output Frequency (High Byte)
11	Analog Output Channel 1 (Low Byte) <1>	11	Output Frequency (Low Byte)
12	Reserved	12	Output Current (High Byte) <5>
13		13	Output Current (Low Byte) <5>
14	Digital Output (High Byte) <2>	14	Analog Input Channel 1 (High Byte)
15	Digital Output (Low Byte) <2>	15	Analog Input Channel 1 (Low Byte)
16	MEMOBUS/Modbus Function Code	16	MEMOBUS/Modbus Function Code
17	MEMOBUS/Modbus Starting Register Address (High Byte)	17	MEMOBUS/Modbus Starting Register Address (High Byte)

## 7 PROFIBUS-DP Option Data and I/O Maps

Output (Master Device to Drive)		Input (Drive to Master Device)	
Byte	Description	Byte	Description
18	MEMOBUS/Modbus Starting Register Address (Low Byte)	18	MEMOBUS/Modbus Starting Register Address (Low Byte)
19	MEMOBUS/Modbus Number of Data	19	MEMOBUS/Modbus Number of Data
20	MEMOBUS/Modbus Data 1 (High Byte)	20	MEMOBUS/Modbus Data 1 (High Byte)
21	MEMOBUS/Modbus Data 1 (Low Byte)	21	MEMOBUS/Modbus Data 1 (Low Byte)
22	MEMOBUS/Modbus Data 2 (High Byte)	22	MEMOBUS/Modbus Data 2 (High Byte)
23	MEMOBUS/Modbus Data 2 (Low Byte)	23	MEMOBUS/Modbus Data 2 (Low Byte)
24	MEMOBUS/Modbus Data 3 (High Byte)	24	MEMOBUS/Modbus Data 3 (High Byte)
25	MEMOBUS/Modbus Data 3 (Low Byte)	25	MEMOBUS/Modbus Data 3 (Low Byte)
26	MEMOBUS/Modbus Data 4 (High Byte)	26	MEMOBUS/Modbus Data 4 (High Byte)
27	MEMOBUS/Modbus Data 4 (Low Byte)	27	MEMOBUS/Modbus Data 4 (Low Byte)
28	Reserved	28	Reserved
29		29	
30		30	
31	Handshaking Register	31	Handshaking Register

- <1> To select drive analog output channel for communications, set H4-01 (Multi-Function Analog Output Terminal AM) to 000 (through-mode).
- <2> Drive digital output ON/OFF during communications, set H2-01 (Terminal MA, MB and MC Function Selection (relay)), H2-02 (Terminal P1 Function Selection (open-collector)), and H2-03 (Terminal P2 Function Selection (open-collector)) to F (through-mode).
- <3> Unit depends on the setting of o1-03 (Digital Operator Display Scaling). Input data is 0 when the drive is set for V/f Control.
- <4> Cannot be used when setting A1-02 (Control Method Selection) to 0 (V/f Control without PG).
- <5> Data is displayed in units of either 0.01 A for drives 7.5 kW and smaller, or in units of 0.1 A for drives 11 kW and larger. This is the same regardless of whether the drive is set for Normal Duty or Heavy Duty operation.

## 7 PROFIBUS-DP Option Data and I/O Maps

**Table 13 Extended Data 2 Register Map**

Output (Master Device – Drive)		Input (Drive – Master Device)	
Byte	Description	Byte	Description
0	Operation Command (High Byte)	0	Drive Status (High Byte)
1	Operation Command (Low Byte)	1	Drive Status (Low Byte)
2	Frequency Reference (High Byte)	2	Motor Speed (High Byte) <I>
3	Frequency Reference (Low Byte)	3	Motor Speed (Low Byte) <I>
4	MEMOBUS/Modbus Function Code	4	MEMOBUS/Modbus Function Code
5	MEMOBUS/Modbus Starting Register Address (High Byte)	5	MEMOBUS/Modbus Starting Register Address (High Byte)
6	MEMOBUS/Modbus Starting Register Address (Low Byte)	6	MEMOBUS/Modbus Starting Register Address (Low Byte)
7	MEMOBUS/Modbus Data Length	7	MEMOBUS/Modbus Data Length
8	MEMOBUS/Modbus Data 1 (High Byte)	8	MEMOBUS/Modbus Data 1 (High Byte)
9	MEMOBUS/Modbus Data 1 (Low Byte)	9	MEMOBUS/Modbus Data 1 (Low Byte)
10	Reserved	10	Reserved
11	Handshaking Register	11	Handshaking Register

<I> Unit depends on the setting of o1-03 (Digital Operator Display Scaling). When the drive is operating in the V/f Control mode, the drive's output frequency becomes the input data.

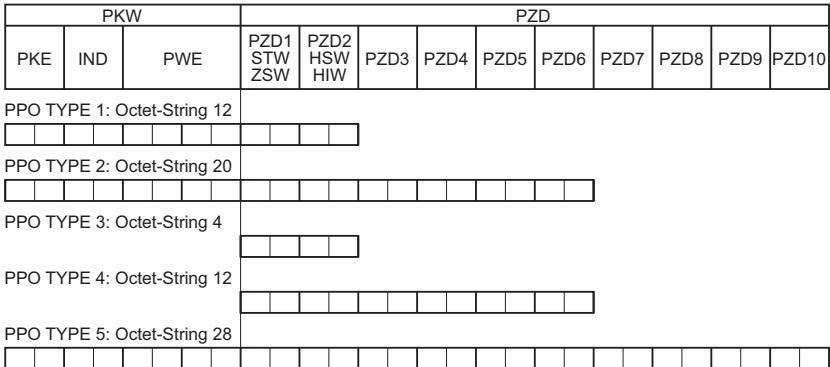
### ◆ Supported Parameter Process Data Object (PPO) Type Formats

Set drive parameter F6-32 = “0” to use PPO type formats. The PPO is defined for cyclic data transfer, allowing the master and the slave to exchange process data (PZD) and parameters. Refer to the PROFIBUS specification for more information on PPO types 1 to 5. Refer to the PROFIBUS specification for more information on PPO types 1 to 5.

PROFIBUS-DP Option supports five possible PPO type formats:

PPO type 1 (8 octets PKW + 4 octets PZD)
PPO type 2 (8 octets PKW + 12 octets PZD)
PPO type 3 (4 octets PZD)
PPO type 4 (12 octets PZD)
PPO type 5 (8 octets PKW + 20 octets PZD)

All PPO Types have the registers STW, ZSW, HSW, and HIW. These registers are not mapped directly to drive registers.



- PKW: Parameter ID/value
- PZD: Process Data, cyclically transferred
- PKE: Parameter ID (1st and 2nd octet)
- IND: Sub-index (3rd octet), 4th octet is reserved
- PWE: Parameter value (5th until 8th octet)
- STW: Control word
- HSW: Main setpoint
- ZSW: Status word
- HIW: Main actual value

# 8 Troubleshooting

### ◆ Drive-Side Error Codes

Drive-side error codes appear on the drive LED operator. Causes of the errors and corrective actions are listed in [Table 14](#). For additional error codes that may appear on the LED operator screen, refer to the technical manual for the drive.

### ■ Faults

bUS (PROFIBUS-DP Option Communication Error) and EF0 (External Fault Input from the PROFIBUS-DP Option) may appear as an alarm or a fault. When a fault occurs, the digital operator LEDs remain lit. When an alarm occurs, the digital operator LEDs flash and the “ALM” light illuminates.

If communication stops while the drive is running, check the following items to resolve the fault:

- Is the PROFIBUS-DP Option properly installed?
- Is the communication line properly connected to the PROFIBUS-DP Option? Is it loose?
- Is the controller program working? Has the controller CPU stopped?
- Did a momentary power loss interrupt communications?

**Table 14 Fault Display and Possible Solutions**

LED Operator Display		Fault Name
<i>bUS</i>	bUS	PROFIBUS-DP Option Communication Error
		<ul style="list-style-type: none"> <li>• After establishing initial communication, the connection was lost.</li> <li>• Only detected when the run command or frequency reference is assigned to the option (b1-03 = 3 or b1-02 = 3).</li> </ul>
Cause		Possible Solution
Master controller (PLC) has stopped communicating.		Check for faulty wiring.
Communication cable is not connected properly.		Correct any wiring problems.
A data error occurred due to noise.		Check the various options available to minimize the effects of noise. <ul style="list-style-type: none"> <li>• Take steps to counteract noise in the control circuit wiring, main circuit lines, and ground wiring.</li> <li>• If a magnetic contactor is identified as a source of noise, install a surge absorber to the contactor coil.</li> </ul> Use cables recommended by Yaskawa, or another type of shielded line. Ground the shield on the controller side and on the PROFIBUS-DP Option side.
PROFIBUS-DP Option is damaged.		If there are no problems with the wiring and the error continues to occur, replace the PROFIBUS-DP Option.



LED Operator Display		Fault Name
EF0	EF0	External Fault Input from PROFIBUS-DP Option The alarm function for an external device has been triggered.
Cause		Possible Solution
An external fault is being sent from the upper controller (PLC).		<ul style="list-style-type: none"> <li>• Remove the cause of the external fault.</li> <li>• Reset the external fault input from the upper controller (PLC) device.</li> </ul>
Problem with the upper controller (PLC) program.		Check the program used by the upper controller (PLC) and make the appropriate corrections.
LED Operator Display		Fault Name
oFA00	oFA00	PROFIBUS-DP Option Fault (Port A) PROFIBUS-DP Option is not properly connected.
Cause		Possible Solution
Non-compatible option connected to the drive.		Connect an option that is compatible with the drive.
LED Operator Display		Fault Name
oFA01	oFA01	PROFIBUS-DP Option Fault (Port A) PROFIBUS-DP Option is not properly connected.
Cause		Possible Solution
Problem with the connectors between the drive and PROFIBUS-DP Option.		Turn the power off and check the connectors between the drive and PROFIBUS-DP Option.
LED Operator Display		Fault Name
oFA03	oFA03	PROFIBUS-DP Option Fault (Port A) PROFIBUS-DP Option self-diagnostics error
Cause		Possible Solution
PROFIBUS-DP Option hardware fault.		Replace the PROFIBUS-DP Option. Contact Yaskawa for assistance.
LED Operator Display		Fault Name
oFA04	oFA04	PROFIBUS-DP Option Fault (Port A) PROFIBUS-DP Option Flash write mode
Cause		Possible Solution
PROFIBUS-DP Option hardware fault.		Replace the PROFIBUS-DP Option. Contact Yaskawa for assistance.
LED Operator Display		Fault Name
oFA30 to oFA43	oFA30 to oFA43	PROFIBUS-DP Option Fault (port A) Communication ID error
Cause		Possible Solution
PROFIBUS-DP Option hardware fault		⇒ Replace the PROFIBUS-DP Option. Contact Yaskawa for assistance.

## 8 Troubleshooting

### ■ Minor Faults and Alarms

Table 15 Alarm Display

LED Operator Display		Minor Fault Name	
<i>bb</i>	bb	Baseblock	
		Data format and setting contents do not match.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
<p>The drive output is disabled. "bb" will be displayed on the operator when the drive is set for control by PROFIBUS-DP and:</p> <ul style="list-style-type: none"> <li>a conventional data format is used and the operation command bit F is set to 1.</li> <li>a PPO type data format is used the the control word (STW) bit 3 is set to 0.</li> </ul>		Set either of the bits depending on which data format is used.	No output
LED Operator Display		Minor Fault Name	
<i>CALL</i>	CALL	Serial Communication Transmission Error	
		Communication has not yet been established.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
Communication wiring is faulty, there is a short circuit, or something is not connected properly.		<p>Check for wiring errors</p> <p>⇒ Correct the wiring.</p> <p>⇒ Remove and ground shorts and reconnect loose wires.</p>	YES
Programming error on the master side		⇒ Check communications at start-up and correct programming errors.	
Communication circuitry is damaged.		<p>Perform a self-diagnostics check.</p> <p>⇒ Replace the drive if the fault continues to occur.</p>	

## **9 European Standards**



**Figure 22 CE Mark**

The CE mark indicates compliance with European safety and environmental regulations. It is required for engaging in business and commerce in Europe.

European standards include the Machinery Directive for machine manufacturers, the Low Voltage Directive for electronics manufacturers, and the EMC guidelines for controlling noise.

This option displays the CE mark based on the EMC guidelines.

### **EMC Guidelines: 2004/108/EC**

Drives used in combination with this option and devices used in combination with the drive must also be CE certified and display the CE mark. When using drives displaying the CE mark in combination with other devices, it is ultimately the responsibility of the user to ensure compliance with CE standards. After setting up the device, verify that conditions meet European standards.

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### **◆ EMC Guidelines Compliance**

This option is tested according to European standards EN 61800-3:2004/A1:2012 and complies with EMC guidelines. We declared the CE marking based on the harmonized standards.

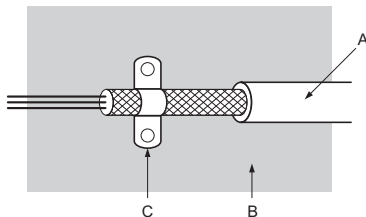
### **■ Installation Method**

Verify the following installation conditions to ensure that other devices and machinery used in combination with this option and drives also comply with EMC guidelines.

- 1.** Use dedicated shield cable for the option and external device (encoder, I/O device, master), or run the wiring through a metal conduit.
- 2.** Keep wiring as short as possible. Ground the shield according to [Figure 24](#).

## 9 European Standards

3. Ground the largest possible surface area of the shield to the metal panel when using dedicated shield cable.



A – Braided shield cable

C – Cable clamp (conductive)

B – Metal panel

Figure 23 Ground Area

### ■ Option Installation for CE Compliance: Model SI-□□/V

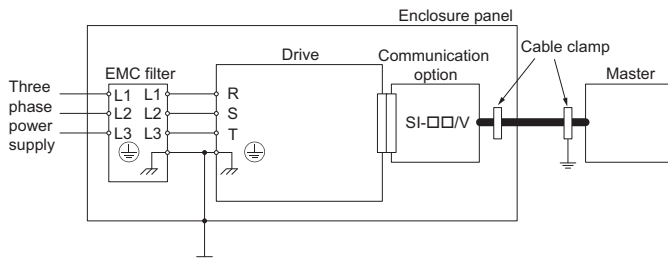


Figure 24 Option Installation for CE Compliance

# 10 Specifications

## ◆ Specifications

**Table 16 Option Unit Specifications**

Items	Specifications
<b>Model</b>	SI-P3/V (PCB model: SI-P3)
<b>PROFIBUS-DP Data</b>	<ul style="list-style-type: none"> <li>• PROFIBUS DP-V0, V1</li> <li>• PPO TYPE: 1 to 5 (No. 3.072, Profile for Variable Speed Drives)</li> <li>• Extended data 1 High-speed I/O data (inputs: 16 bytes, outputs: 16 bytes) MEMOBUS/Modbus message (inputs: 16 bytes, outputs: 16 bytes)</li> <li>• Extended data 2 High-speed I/O data (inputs: 4 bytes, outputs: 4 bytes) MEMOBUS/Modbus message (inputs: 8 bytes, outputs: 8 bytes)</li> <li>• Basic data High-speed I/O data (inputs: 6 bytes, outputs: 6 bytes)</li> </ul>
<b>Connector</b>	9-pin D-SUB connector (#4/40 UNC thread)
<b>Communications Speed</b>	9.6 kbps to 12 Mbps
<b>Ambient Temperature</b>	-10°C to +50°C (14°F to 122°F)
<b>Humidity</b>	Up to 95% RH (no condensation)
<b>Storage Temperature</b>	-20°C to +60°C (-4°F to 140°F) allowed for short-term transport of the product
<b>Area of Use</b>	Indoor (free of corrosive gas, airborne particles, etc.)
<b>Altitude</b>	1000 m (3280 ft.) or lower

## 10 Specifications

### ◆ Revision History

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

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		Back cover	Revision: Address
December 2016	<11>	Back cover	Revision: Address
September 2016	<10>	Back cover	Revision: Address
June 2015	<9>	All	Revision: <ul style="list-style-type: none"> <li>• Upgraded the software version to PRG: 2103 and PRG: 2104.</li> <li>• Reviewed and corrected entire documentation.</li> </ul>
		Chapter 9	Addition: European Standards
March 2015	<8>	Back cover	Revision: Address
November 2014	<7>	–	Japanese version only.
February 2014	<6>	Back cover	Revision: Address
April 2011	<5>	All	Addition: SI-P3/T added along with corresponding data.
December 2010	<4>	Front cover	Revision: Format
		Back cover	Revision: Address, format
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September 2008	<2>	All	Revision: Reviewed and corrected entire document
		Chapter 6	Addition: Parameter F6-07 and F6-08
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January 2008	<1>	Back cover	Revision: Address
May 2007	–	–	First Edition

# YASKAWA AC Drive 1000-Series Option PROFIBUS-DP Installation Manual

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Specifications are subject to change without notice for ongoing product modifications and improvements.

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