

## YASKAWA U1000-Series Option 24 V Power Supply Installation Manual

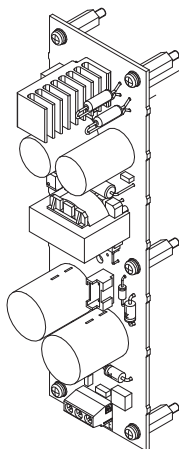
Type: PS-U10L, PS-U10H

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 U1000シリーズオプション 24 V制御電源ユニット 取扱説明書

形式 : PS-U10L, PS-U10H

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また、本書をお手元に保管していただくとともに、最終的に本製品をご使用になるユーザー様のお手元に確実に届けられるよう、お取り計らい願います。



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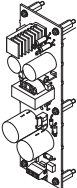
## 1 Preface and Safety

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.

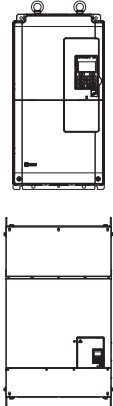
### ◆ Applicable Documentation

The following manuals are available for the option:

#### Option

	<p><b>YASKAWA U1000-Series Option 24 V Power Supply Installation Manual Manual No.: TOBP C730600 95 (This book)</b></p>	<p>Read this manual first. The installation manual is packaged with the option and contains information necessary to install the option and set related drive parameters.</p>
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## Drive

	<b>Low Harmonics Regenerative Matrix Converter YASKAWA U1000 Series Quick Start Guide</b>	<p>The drive manuals include basic installation, wiring, operation procedures, functions, troubleshooting, and maintenance information.</p> <p>The manuals also include important information about parameter settings and drive tuning.</p> <p>Go to these websites to download Yaskawa manuals:</p> <p>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>
	<b>Low Harmonics Regenerative Matrix Converter YASKAWA U1000 Series Technical Manual</b>	
	<b>Low Harmonics Regenerative Matrix Converter for Elevator Applications YASKAWA U1000L Series Quick Start Guide</b>	
	<b>Low Harmonics Regenerative Matrix Converter for Elevator Applications YASKAWA U1000L Series Technical Manual</b>	
	<b>Low Harmonic Drive for HVAC Applications Z1000U HVAC MATRIX Drive Programming Manual Manual No.: SIEP C710636 10</b>	
	<b>Low Harmonic Drive for HVAC Applications Z1000U HVAC MATRIX Drive User Manual Manual No.: TOEP C710636 10</b>	
<b>Low Harmonic Drive for HVAC Applications Z1000U HVAC MATRIX Drive Quick Start Guide Manual No.: TOEP C710636 11</b>		

## ◆ Terms

- Note:** Identifies information that is not a safety message.
- Option:** YASKAWA U1000-Series Option 24 V Power Supply
- Drive:**
- YASKAWA U1000 Series Regenerative Matrix Converter
  - YASKAWA U1000L Series Regenerative Matrix Converter for Elevator Applications
  - YASKAWA Z1000U Matrix Drive for HVAC Applications

## ◆ Registered Trademarks

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# 1 Preface and Safety

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## ◆ Supplemental Safety Information

Read this manual before installing, operating, or servicing the option.

Follow the instructions in this manual and local codes to install the option.

Safety messages are identified by the methods shown below. Failure to obey these safety messages in the manual can cause serious injury or death. Yaskawa is not responsible for injuries or damage to equipment caused by ignoring the safety messages.

### **DANGER**

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

### **WARNING**

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

### **CAUTION**

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

### **NOTICE**

Indicates a property damage message.

## ■ General Safety

### General Precautions

- Figures in this manual can show options and drives without covers or safety shields. Install covers and safety shields before operating the option or drive. Use the option as shown in this manual.
- The figures in this manual are examples. The figures do not always apply to all the products to which this manual is applicable.
- The products and specifications given in this manual and the manual contents can change without notice to make the product and manual better.
- To order paper copies of the manual, contact a Yaskawa representative or the nearest Yaskawa sales office and give the manual number shown on the front cover.

### DANGER

#### **Obey the safety messages in this manual.**

Failure to obey will cause death or serious injury.

The operating company is responsible for injuries and equipment damage when they do not obey the safety messages in this manual.

### WARNING

#### **Electrical Shock Hazard**

##### **Do not make changes to the drive body or drive circuitry.**

Failure to obey can cause death or serious injury and will void warranty. Yaskawa is not responsible for changes to the product made by the user.

### NOTICE

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

Failure to obey can damage the electrical components in the drive and option.

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

Do not sterilize the package after packing the product.

# 1 Preface and Safety

## ■ Option Label Warnings

Warning information is displayed on the package. Follow all warnings and safety instructions when using the product.

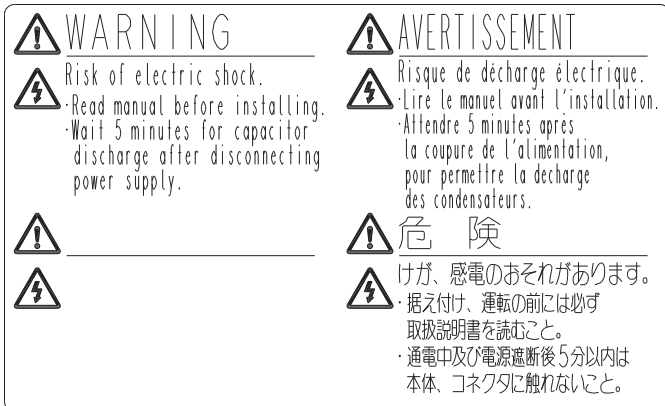


Figure 1 Warning Label



## 2 Product Overview

### ◆ About this Product

The 24 V Power Supply Option supplies the drive control circuit with power when there is no main circuit power.

The option provides external power to the control circuit only. It will not provide power to the drive main circuit.

The option lets users access network communications, digital operator navigation, and I/O data, and read fault and parameter data.

**Note:** Parameter settings cannot usually be changed without drive main circuit power regardless of whether the control circuit has enough power to operate. However, parameter settings can be changed when o2-19 (Selection of Parameter Write during UV) is set to 1 (Enabled).

### ◆ Compatible Drive Models

Use the option with the drive models in [Table 1](#).

**Table 1 Compatible Drive Models**

	Drive	Option Model
U1000, U1000L	CIMR-U□2□□□□□	PS-U10L
	CIMR-U□4□□□□□	PS-U10H
Z1000U	CIMR-Z□2□□□□□	PS-U10L
	CIMR-Z□4□□□□□	PS-U10H


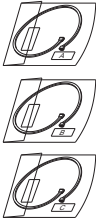



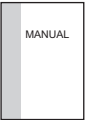
**Note:** Compatible with models of the following software versions.  
 U1000: S5171 and S1017 or later  
 U1000 (for Crane Application): S6412 or later  
 U1000L: S6213 or later

## 3 Receiving

Please check these items after receiving the option:

- Examine the option for damage. Immediately contact the shipping company if the option is damaged. The Yaskawa warranty does not cover damage from shipping.
- Verify the option model number to make sure that you received the correct model. Refer to *Figure 3* for detail.
- Contact your supplier if you receive the incorrect model or if the option does not operate correctly.

### ◆ Option Package Contents

Description:	Option	Connection Cables	Screws (M3)	Studs	Cable Ties	Installation Manual
-						
<b>Quantity:</b>	1	3	6	6	2	1

### ◆ Tools Required to Install the Option

- A Phillips screwdriver (M4 metric / #1, #2 U.S. standard size) to install the option.
- A straight-edge screwdriver (blade depth: 0.4 mm, width: 2.5 mm) to install the drive and wire the option terminal block.
- A wire cutter to cut the cable ties.
- An open-end wrench, a box-end wrench, and a ratchet wrench (dia.: 6 mm) to install the studs. Tightening torque for studs: 0.5 to 0.7 N·m

**Note:** The manual does not list the tools to prepare option cables for wiring.

## 4 Option Components

### ◆ Option

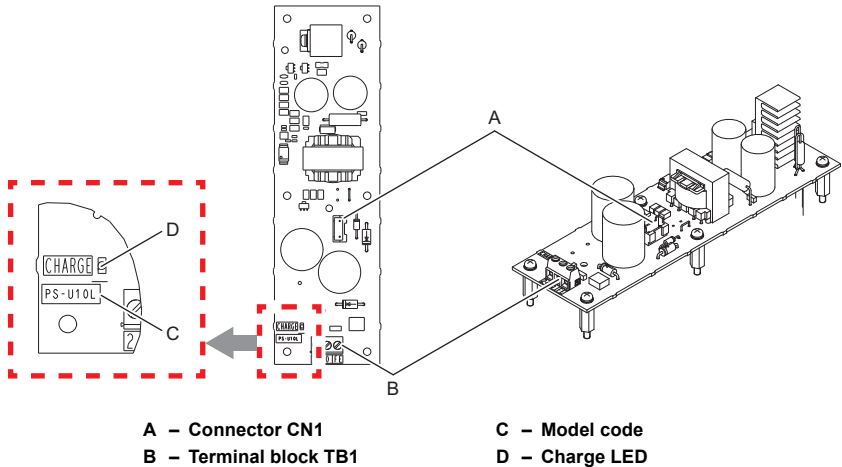


Figure 2 24 V Power Supply Option Components

### ◆ Option Nameplate

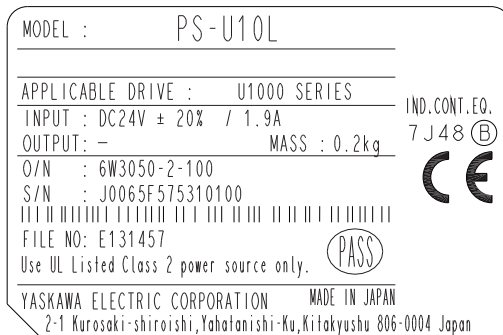


Figure 3 PS-U10L Nameplate Example

## 4 Option Components

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### ◆ Terminal Block TB1



### ■ Terminal Functions

Terminal	Function
24	+24 Vdc Input
0	0 V
FE	Ground

## 5 Installation Procedure

### ◆ Section Safety

#### DANGER

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

**Do not examine, connect, or disconnect wiring on an energized drive.**

Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. Failure to obey will cause death or serious injury.

**Disconnect the power to the drive and wait for the charge indicator LED to go off, then remove the covers.**

Failure to obey could cause death or serious injury. Figures in this section can show options and drives without covers or safety shields. Install covers and safety shields before operating the option or drive. Use the option as shown in this manual.

#### WARNING

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

**Only let authorized persons install, wire, maintain, examine, replace parts, and repair the drive and option.**

Failure to obey can cause death or serious injury.

**Do not use damaged wires, stretch the wires, or destroy the wire insulation.**

Failure to obey could cause death or serious injury.

### **WARNING**

#### **Fire Hazard**

**Tighten all terminal screws to the correct tightening torque.**

Connections that are too loose or too tight can cause incorrect operation and damage to the drive. Incorrect connections can also cause death or serious injury from fire.

### **NOTICE**

#### **Damage to Equipment**

**Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards.**

Failure to obey can cause ESD damage to the drive circuitry.

**Do not de-energize the drive while the drive is supplying voltage.**

Incorrect equipment sequencing can cause damage to the drive.

**Do not connect or operate damaged equipment or equipment with missing parts.**

Failure to obey can cause damage to the drive and connected equipment.

**Do not use unshielded wire for control wiring.**

Use shielded, twisted-pair wires and ground the shield to the ground terminal of the drive. Failure to obey can cause electrical interference and unsatisfactory system performance.

**Correctly connect all pins and connectors.**

Failure to obey can cause incorrect operation and damage to equipment.

**Make sure that all connections are correct after installing the option and connecting peripheral devices.**

Failure to obey can cause damage to the drive.

### ◆ Before Installing the Option

Before installing the option, wire the drive, make the necessary connections to the drive terminals, and verify that the drive functions correctly without the option.

Refer to the manual packaged with the drive for information on wiring and connecting the drive.

### ◆ Installation Methods

There are six installation methods for the option.

Find your drive model number on the drive nameplate and use [Table 2](#) to find the correct installation method.

**Table 2 Model-Specific Installation Methods**

	Drive Model	Installation Method	Page
U1000	2□0028 to 2□0081, 4□0011 to 4□0077	A	22
	2□0104, 2□0130, 4□0096, 4□0124	B	25
	2□0154, 2□0192, 4□0156, 4□0180	C	28
	2□0248, 4□0216, 4□0240	D	31
	4□0302 to 4□0414	E	34
	4A0477 to 4A0930	F	37
U1000L	2□0028 to 2□0068, 4□0034 to 4□0065	A	22
	2□0081, 2□0104, 4□0077, 4□0096	B	25
Z1000U	2□0028 to 2□0081, 4□0011 to 4□0077	A	22
	2□0104, 2□0130, 4□0096, 4□0124	B	25
	2□0154, 2□0192, 4□0156, 4□0180	C	28
	2□0248, 4□0216, 4□0240	D	31
	4□0302 to 4□0414	E	34

## 5 Installation Procedure

### ■ Installation Locations

Figure 4 to Figure 11 show the locations where the option is to be installed.

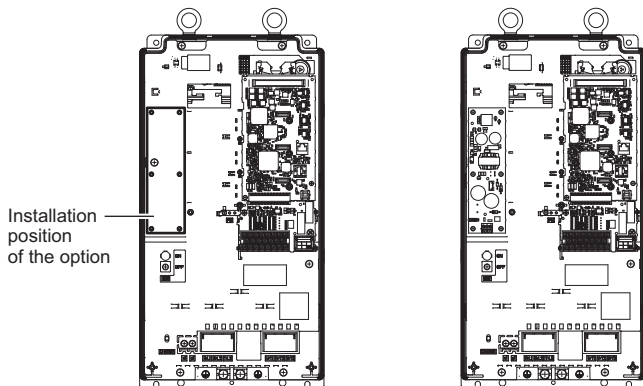


Figure 4 U1000, Z1000U: 2□0028, 4□0011 to 4□0034

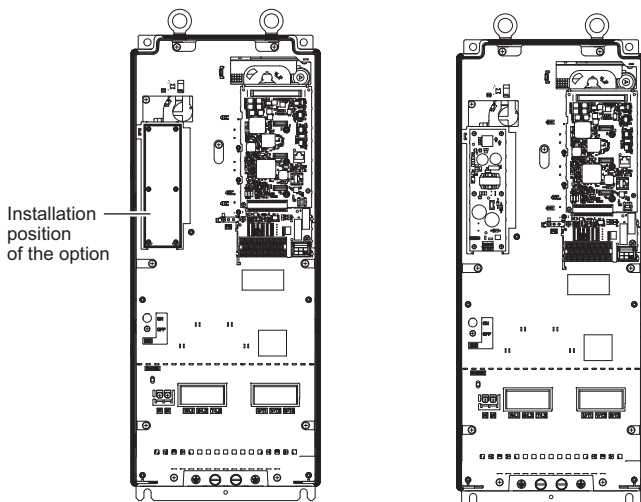
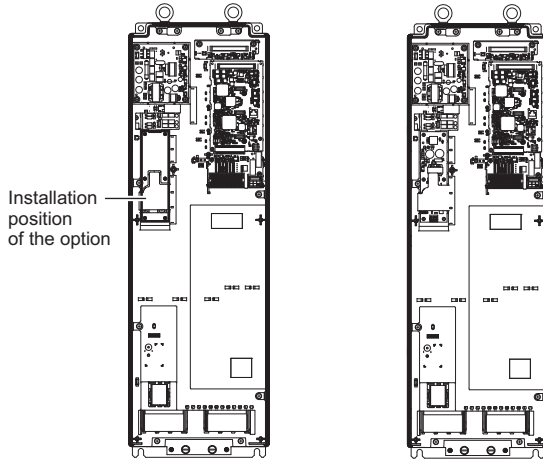


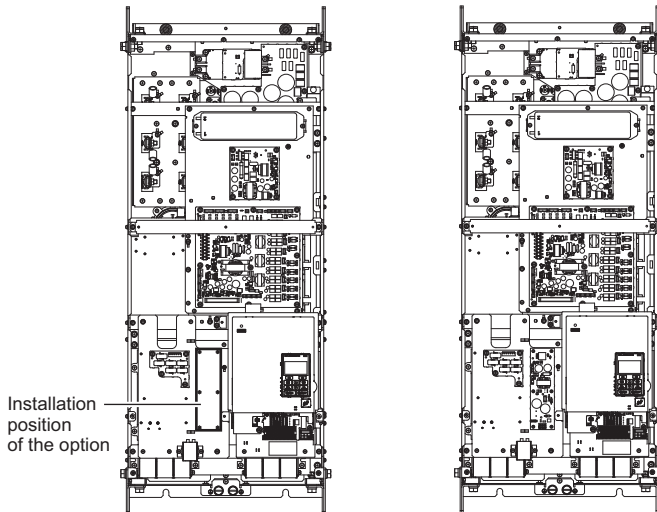
Figure 5 U1000, Z1000U: 2□0042 to 2□0081, 4□0040 to 4□0077  
U1000L: 2□0028 to 2□0068, 4□0034 to 4□0065



## 5 Installation Procedure



**Figure 6 U1000, Z1000U: 2□0104, 2□0130, 4□0096, 4□0124  
U1000L: 2□0081, 2□0104, 4□0077, 4□0096**



**Figure 7 U1000, Z1000U: 2□0154, 2□0192, 4□0156, 4□0180**

## 5 Installation Procedure

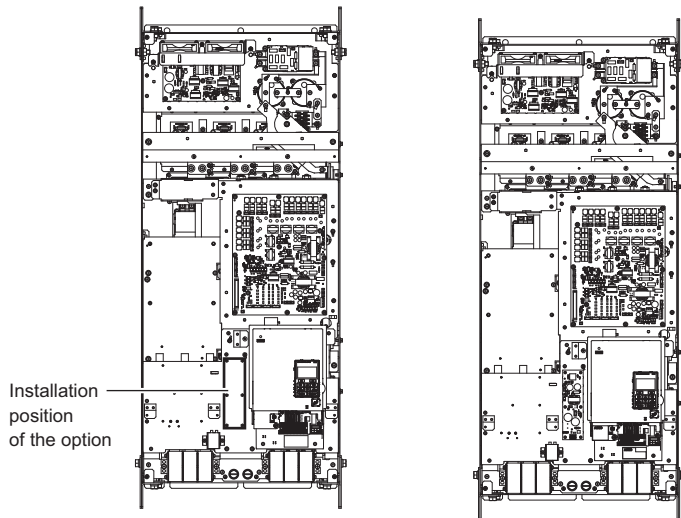


Figure 8 U1000, Z1000U: 2□0248, 4□0216, 4□0240

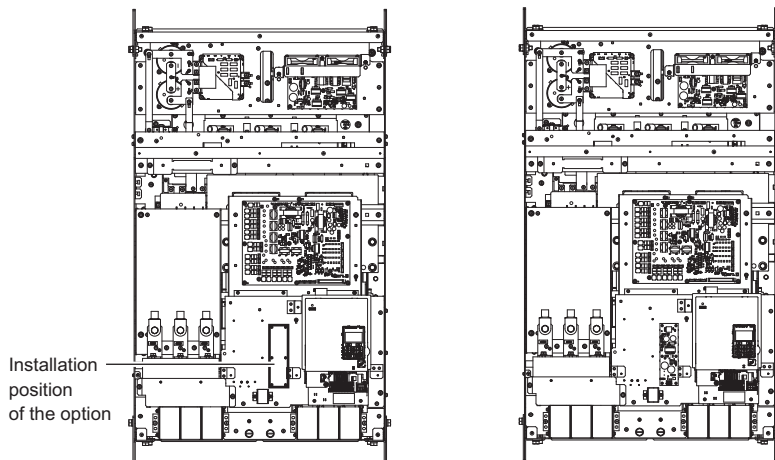
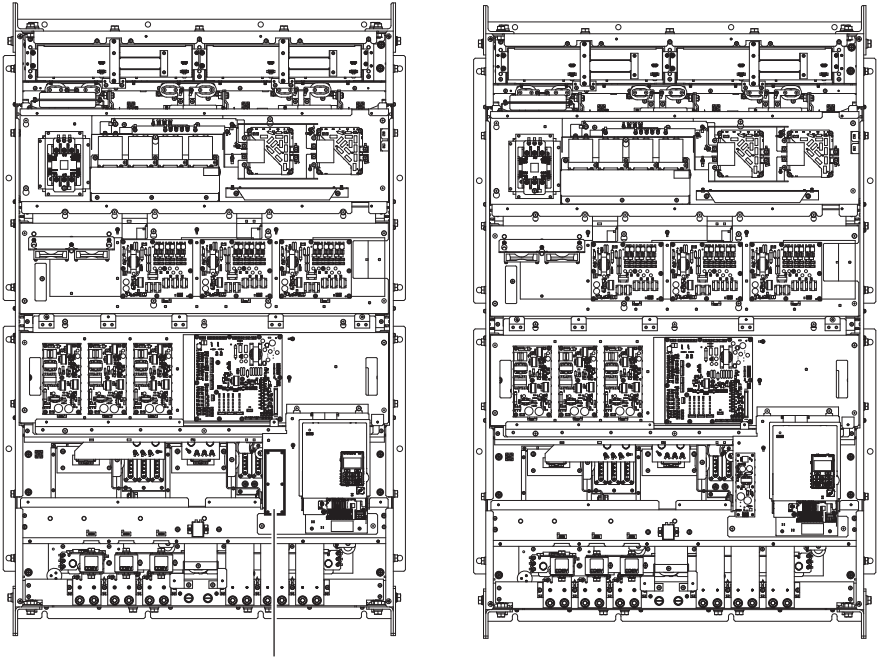


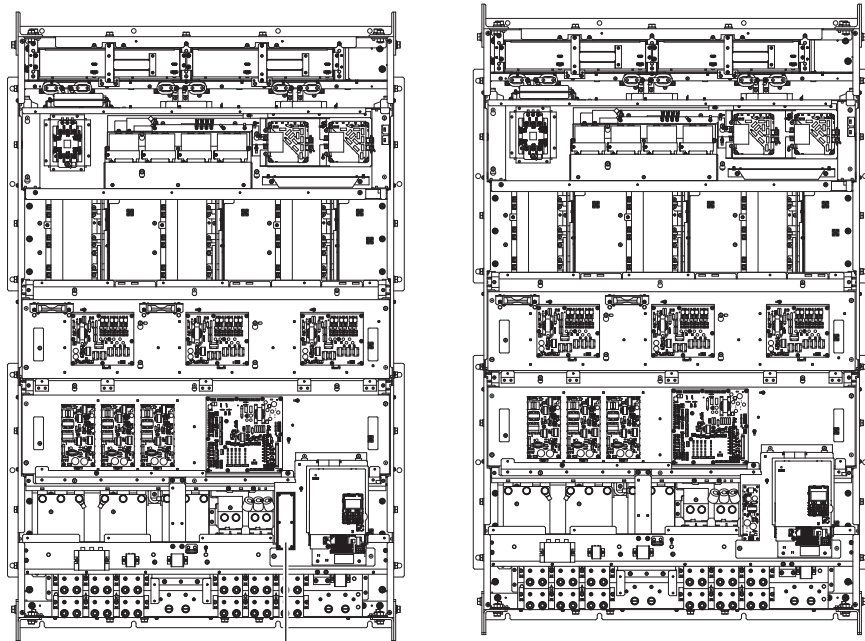
Figure 9 U1000, Z1000U: 4□0302 to 4□0414



Installation position  
of the option

**Figure 10 U1000, Z1000U: 4□0477, 4□0590**

## 5 Installation Procedure



Installation position  
of the option

**Figure 11 U1000, Z1000U: 4□0720 to 4□0930**

### ■ Connection Diagram

Figure 12 illustrates the 24 Vdc Power Supply Option and drive connections.

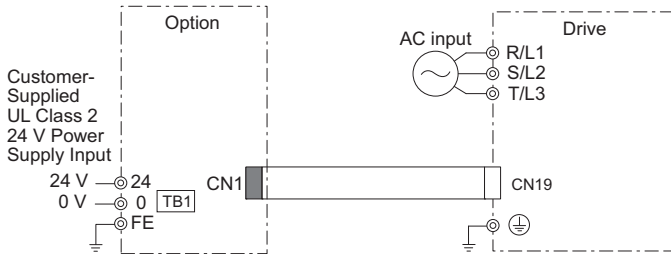


Figure 12 Connection Diagram for Drive and Option

### ■ Wire Gauges and Tightening Torques

Terminal Number	Screw Size	Tightening Torque N·m (in·lb)	Bare Cable		Crimp Terminals		Wire Type
			Recomm. Gauges mm <sup>2</sup>	Applicable Gauges mm <sup>2</sup>	Recomm. Gauges mm <sup>2</sup>	Applicable Gauges mm <sup>2</sup>	
24, 0, FE	M2	0.22 to 0.25 (1.95 to 2.21)	0.75 (18 AWG)	Standard wire: 0.25 to 1.0 (24 to 17 AWG) Single line: 0.25 to 1.5 (24 to 16 AWG)	0.5 (20 AWG)	0.25 to 0.5 (24 to 20 AWG)	Shielded cable, etc.

## 5 Installation Procedure

### ■ Installation Method A

**DANGER!** *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. Failure to obey will cause death or serious injury.*

**NOTICE:** *Damage to Equipment. Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards. Failure to obey can cause ESD damage to the drive circuitry.*

1. De-energize the drive, wait for voltage to dissipate, then remove the digital operator (F), front cover (E), and terminal cover (G). Refer to the manual in the drive package for instructions to remove the digital operator and covers.

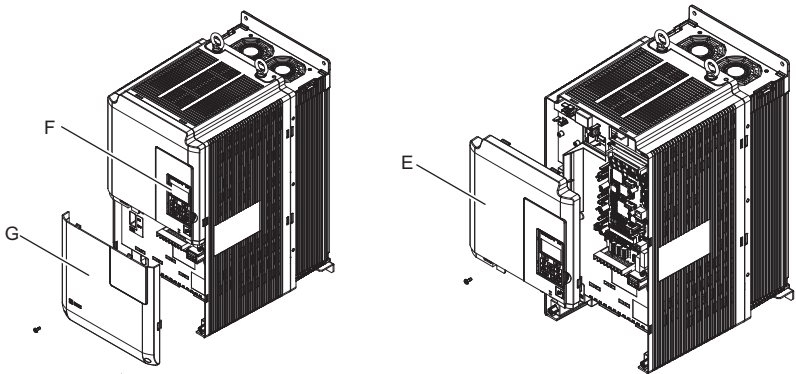


Figure 13 Remove the Front Cover, Terminal Cover, and Digital Operator

2. Connect the option into position with the included screws.

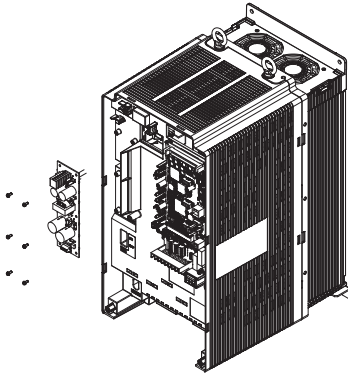


Figure 14 Connect the Option

3. Pull the loose end of the connection cable out of the drive and connect to CN1 on the option.

**NOTICE:** Put the cable connector in the correct position to connect it to the option. An incorrect connection can cause damage to the connector and the drive.

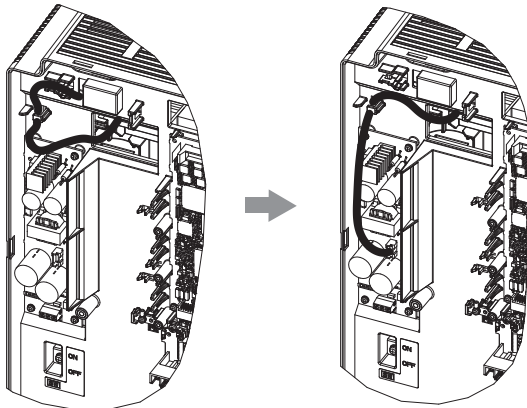
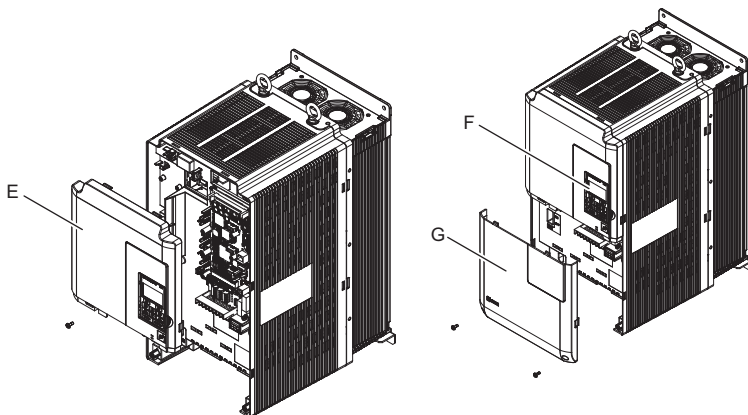


Figure 15 Plug the Connection Cable into the Option

## 5 Installation Procedure

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4. Replace and attach the drive front cover (E) and terminal cover (G) and replace the digital operator (F).



**Figure 16 Replace the Front Cover, Terminal Cover, and Digital Operator**

**Note:** Wire the option to easily fit the front covers back onto the drive. Do not pinch wires between the covers and the drive when replacing the covers.

5. Skip to [Wire the Option on page 40](#).



### ■ Installation Method B

**DANGER!** *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. Failure to obey will cause death or serious injury.*

**NOTICE:** *Damage to Equipment. Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards. Failure to obey can cause ESD damage to the drive circuitry.*

1. De-energize the drive, wait for voltage to dissipate, then remove the digital operator (F), front cover (E), and terminal cover (G). Refer to the manual in the drive package for instructions to remove the digital operator and covers.

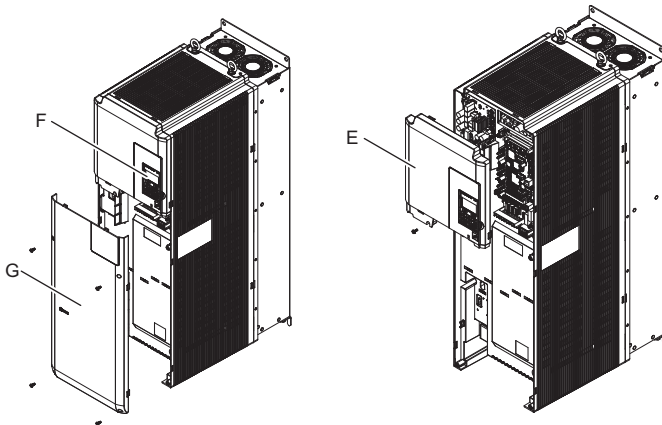


Figure 17 Remove the Front Cover, Terminal Cover, and Digital Operator

## 5 Installation Procedure

2. Connect the option into position with the included screws.

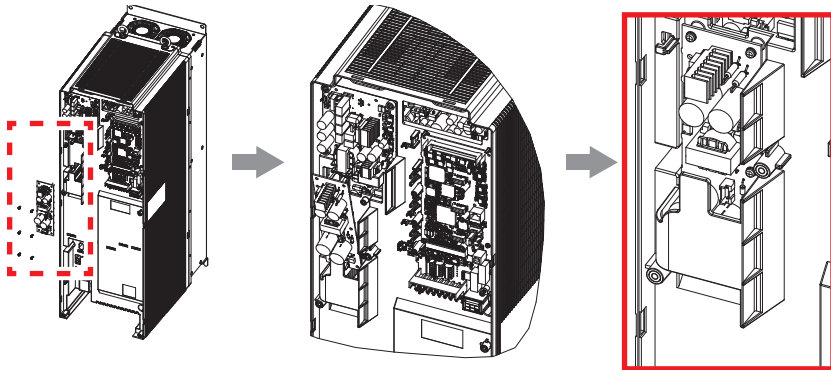


Figure 18 Connect the Option

3. Pull the loose end of the connection cable out of the drive and connect to CN1 on the option.

**NOTICE:** Put the cable connector in the correct position to connect it to the option. An incorrect connection can cause damage to the connector and the drive.

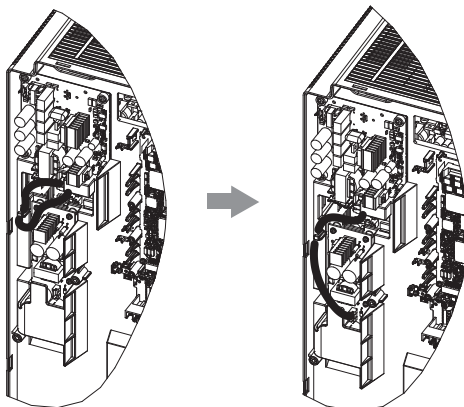
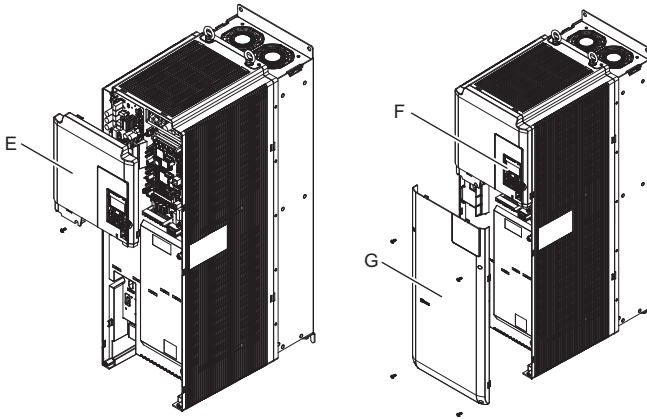


Figure 19 Plug the Connection Cable into the Option

4. Replace and attach the drive front cover (E) and terminal cover (G) and replace the digital operator (F).



**Figure 20 Replace the Front Cover, Terminal Cover, and Digital Operator**

**Note:** Wire the option to easily fit the front covers back onto the drive. Do not pinch wires between the covers and the drive when replacing the covers.

5. Skip to [Wire the Option on page 40](#).

## 5 Installation Procedure

### ■ Installation Method C

**DANGER!** *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. Failure to obey will cause death or serious injury.*

**NOTICE:** *Damage to Equipment. Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards. Failure to obey can cause ESD damage to the drive circuitry.*

1. De-energize the drive, wait for voltage to dissipate, then remove the digital operator (F), front cover (E), and terminal cover (G). Refer to the manual in the drive package for instructions to remove the digital operator and covers.

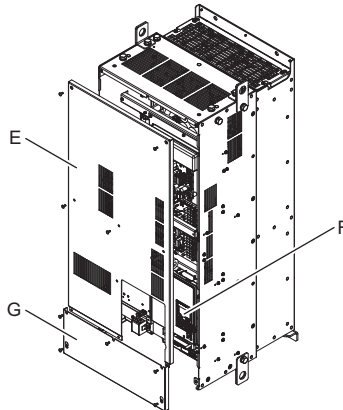


Figure 21 Remove the Front Cover, Terminal Cover, and Digital Operator

2. Connect the option into position with the included screws and studs.

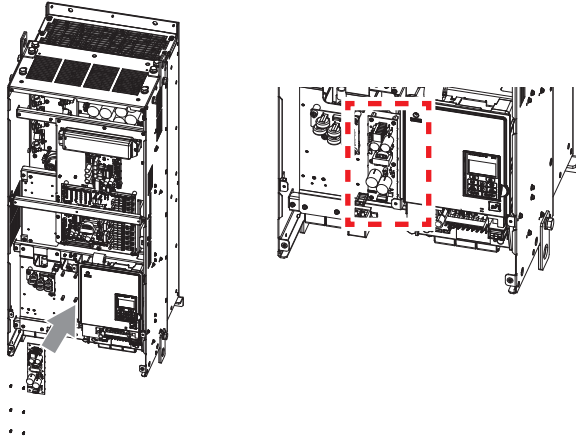


Figure 22 Connect the Option

3. Connect one end of the included connection cable A to CN1 on the option. Connect the other end to CN19 on the drive.

**NOTICE:** Put the cable connector in the correct position to connect it to the drive and option. An incorrect connection can cause damage to the connector and the drive.

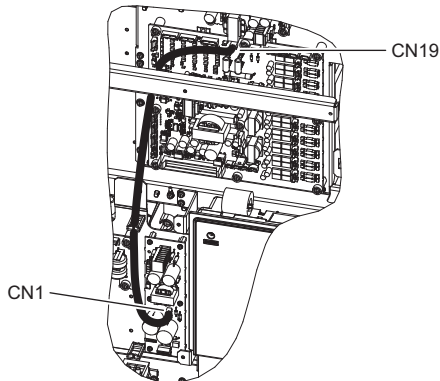
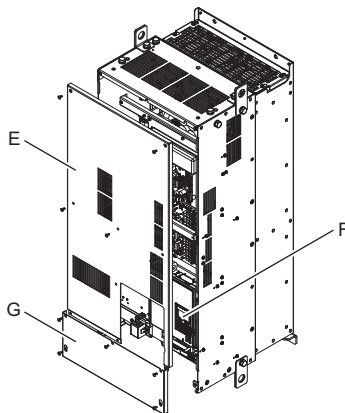


Figure 23 Plug the Connection Cable

## 5 Installation Procedure

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4. Replace and attach the drive front cover (E) and terminal cover (G) and replace the digital operator (F).



**Figure 24 Replace the Front Cover, Terminal Cover, and Digital Operator**

**Note:** Wire the option to easily fit the front covers back onto the drive. Do not pinch wires between the covers and the drive when replacing the covers.

5. Skip to [Wire the Option on page 40](#).

### ■ Installation Method D

**DANGER!** *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. Failure to obey will cause death or serious injury.*

**NOTICE:** *Damage to Equipment. Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards. Failure to obey can cause ESD damage to the drive circuitry.*

1. De-energize the drive, wait for voltage to dissipate, then remove the digital operator (F), front covers (E), and terminal cover (G). Refer to the manual in the drive package for instructions to remove the digital operator and covers.

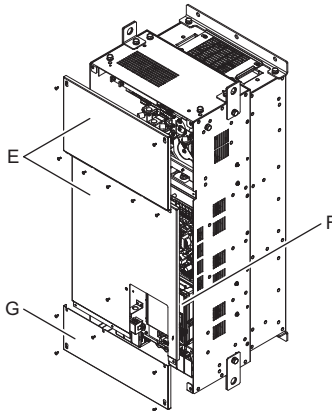


Figure 25 Remove the Front Covers, Terminal Cover, and Digital Operator

## 5 Installation Procedure

2. Connect the option into position with the included screws and studs.

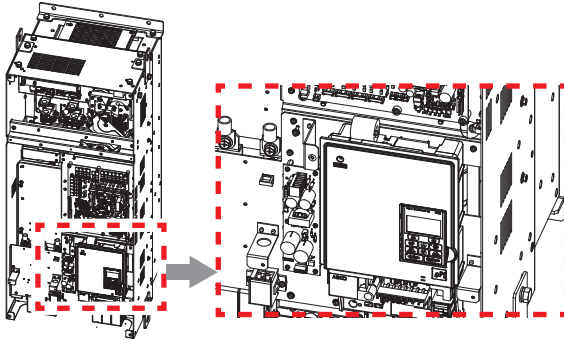


Figure 26 Connect the Option

3. Connect one end of the included connection cable B to CN1 on the option. Connect the other end to CN19 on the drive.

**NOTICE:** Put the cable connector in the correct position to connect it to the drive and option. An incorrect connection can cause damage to the connector and the drive.

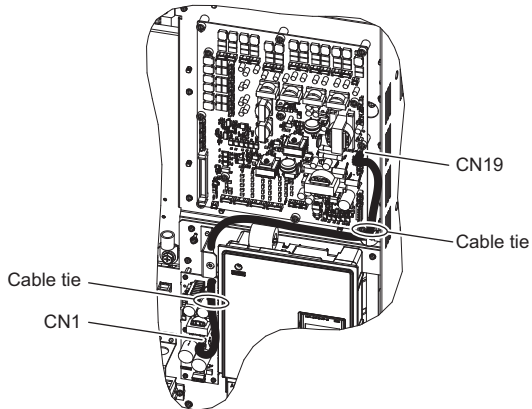
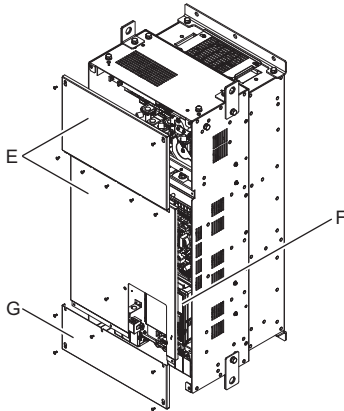


Figure 27 Plug the Connection Cable

**Note:** Tie the connection cable with cables around the two spots shown in [Figure 27](#) using cable ties. Tie the connection cable with the blue ground cable at the option side.



4. Replace and attach the drive front covers (E) and terminal cover (G) and replace the digital operator (F).



**Figure 28 Replace the Front Covers, Terminal Cover, and Digital Operator**

**Note:** Wire the option to easily fit the front covers back onto the drive. Do not pinch wires between the covers and the drive when replacing the covers.

5. Skip to [Wire the Option on page 40](#).

## 5 Installation Procedure

### ■ Installation Method E

**DANGER!** *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. Failure to obey will cause death or serious injury.*

**NOTICE:** *Damage to Equipment. Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards. Failure to obey can cause ESD damage to the drive circuitry.*

1. De-energize the drive, wait for voltage to dissipate, then remove the digital operator (F), front covers (E), and terminal cover (G). Refer to the manual in the drive package for instructions to remove the digital operator and covers.

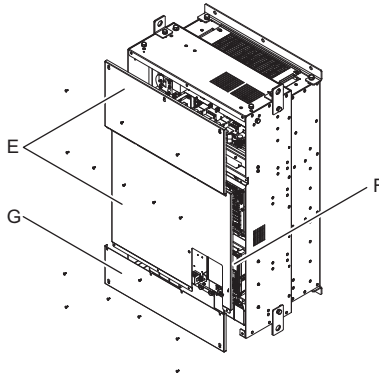


Figure 29 Remove the Front Covers, Terminal Cover, and Digital Operator

2. Connect the option into position with the included screws and studs.

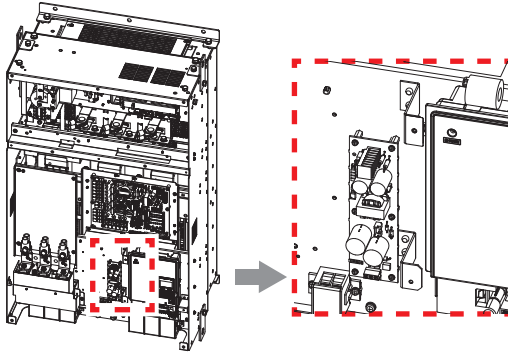


Figure 30 Connect the Option

3. Connect one end of the included connection cable C to CN1 on the option. Connect the other end to CN19 on the drive.

**NOTICE:** Put the cable connector in the correct position to connect it to the drive and option. An incorrect connection can cause damage to the connector and the drive.

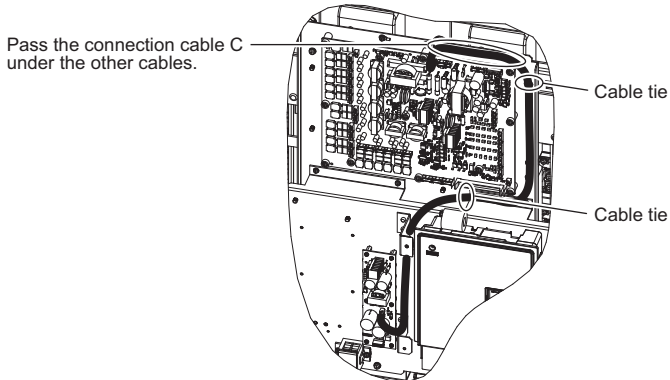


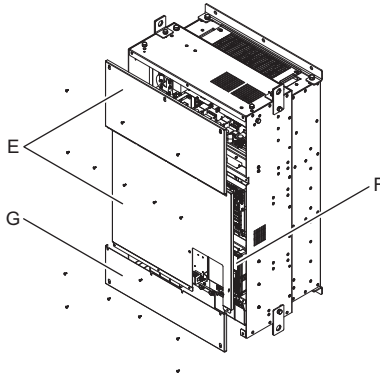
Figure 31 Plug the Connection Cable

**Note:** Pass the connection cable under the other cables at the area shown in [Figure 31](#). Tie the connection cable with cables around the two spots shown in [Figure 31](#) using cable ties.

## 5 Installation Procedure

---

4. Replace and attach the drive front covers (E) and terminal cover (G) and replace the digital operator (F).



**Figure 32 Replace the Front Covers, Terminal Cover, and Digital Operator**

**Note:** Wire the option to easily fit the front covers back onto the drive. Do not pinch wires between the covers and the drive when replacing the covers.

5. Skip to [Wire the Option on page 40](#).

### ■ Installation Method F

**DANGER!** *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. Failure to obey will cause death or serious injury.*

**NOTICE:** *Damage to Equipment. Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards. Failure to obey can cause ESD damage to the drive circuitry.*

1. De-energize the drive, wait for voltage to dissipate, then remove the digital operator (F), front covers (E), and terminal cover (G). Refer to the manual in the drive package for instructions to remove the digital operator and covers.

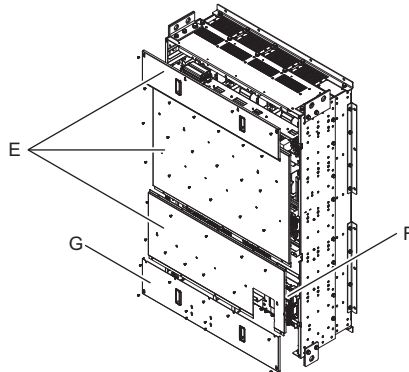


Figure 33 Remove the Front Covers, Terminal Cover, and Digital Operator

## 5 Installation Procedure

2. Connect the option into position with the included screws and studs.

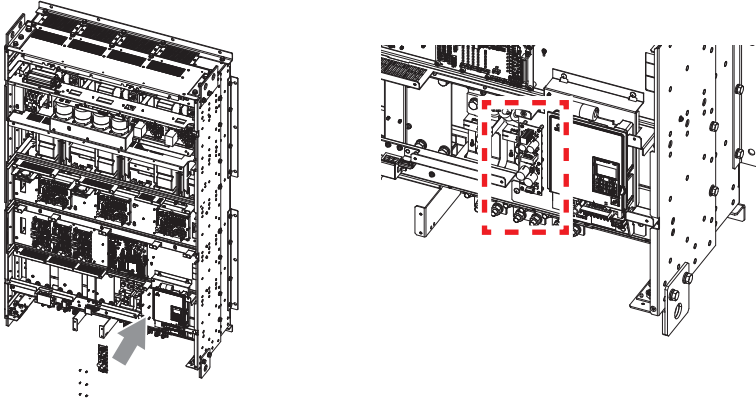


Figure 34 Connect the Option

3. Connect one end of the included connection cable B to CN1 on the option. Connect the other end to CN19 on the drive.

**NOTICE:** Put the cable connector in the correct position to connect it to the drive and option. An incorrect connection can cause damage to the connector and the drive.

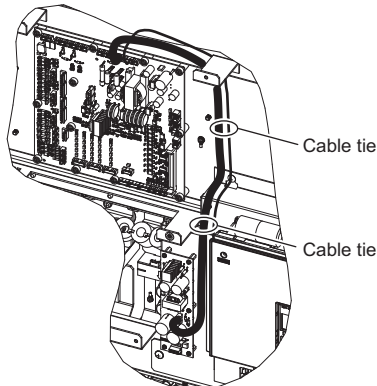
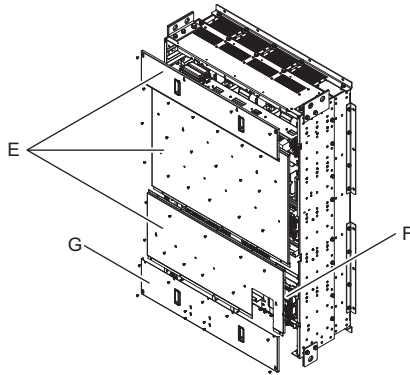


Figure 35 Plug the Connection Cable

**Note:** Tie the connection cable with a cable connected to the LED around the two spots as shown in [Figure 35](#) using cable ties.

4. Replace and attach the drive front covers (E) and terminal cover (G) and replace the digital operator (F).



**Figure 36 Replace the Front Covers, Terminal Cover, and Digital Operator**

**Note:** Wire the option to easily fit the front covers back onto the drive. Do not pinch wires between the covers and the drive when replacing the covers.

5. Skip to [Wire the Option on page 40](#).

## 5 Installation Procedure

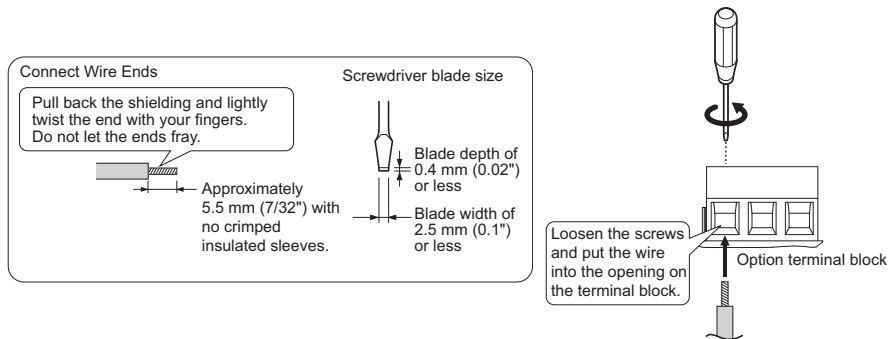
### ◆ Wire the Option

1. Select an external power supply.  
Two times the usual current will flow through the option for approximately 0.5 seconds after energizing the option.  
3 A minimum are necessary for the option to function correctly.

**WARNING!** *Electrical Shock Hazard. Use a battery or a double-reinforced UL Class 2 power supply to provide power to the option. Other power supplies can cause death or serious injury from electrical shock or fire.*

2. Remove the terminal cover and wire Terminal Block TB1.  
Wire the external power supply to terminal block TB1 on the option.  
Use a straight-edge screwdriver to loosen the screws on the terminal block of the option. Then connect wires to the 24 V, 0, and FE terminals as shown in [Figure 37](#) and tighten the terminal screws using the tightening torque in [on page 21](#).  
Be sure to connect each wire correctly, do not pinch wire insulation in the terminals, and cut frayed wires.

**NOTICE:** *Correctly connect an external 24 V power source to the option terminal block. Refer to [Option Specifications on page 42](#) for information. Incorrect terminal connections can cause damage to the option.*



**Figure 37 Wire the Terminal Block**

**WARNING!** *Fire Hazard. Tighten all terminal screws to the correct tightening torque. Connections that are too loose or too tight can cause incorrect operation and damage to the drive. Incorrect connections can also cause death or serious injury from fire.*

**NOTICE:** *Use heat shrink tubing or electrical tape to make sure that cable shielding does not touch other wires. Incorrect insulation can cause damage to the option or drive from a short circuit.*



## 6 Verifying Operation

After correctly wiring and installing the option, use the procedure below to make sure that the option operates correctly:

1. Energize the drive and make sure that 24 Vdc external power is supplied to the 24 V connector plug, and the 24 V connector plug is connected to the option.
2. De-energize the drive. The 24 V external power supply should provide power to the drive control unit.
3. The red LED on the option identifies when the option is operating correctly.
4. The digital operator on the drive will flash “Fdv” or “AUv” for approximately 10 seconds to show an undervoltage condition on the drive.  
If “Fdv” or “AUv” does not flash on the display screen, make sure that the wiring is correct.  
If “Fdv” or “AUv” does not flash on the keypad after making sure that the wiring is correct, the drive or option may be damaged.

### ◆ Power Supply and the Control Circuit

*Table 3* outlines the conditions under which the option provides power to the control circuit.

**Table 3 Power Supply and Control Circuit**

Drive Main Circuit Input Power Supply	Power from Option	Control Circuit Operation in Drive	Drive Operation
ON	ON	Normal operation	Possible
ON	OFF		Possible
OFF	ON		Not possible
OFF	OFF	Stop	Not possible

# 7 Specifications

**Table 4 Option Specifications**

Item	Specifications
Input Operating Voltage	24 Vdc $\pm$ 20% (19.2 V to 28.8 V)
Input Current	1.9 A
Consumption Power	38 W
Output Ride-Thru time (when power is off)	Over 50 ms
Ambient Temperature	-10°C to +50°C (+14°F to +122°F) <I>
Storage Temperature	-20°C to +60°C (-4°F to +140°F) allowed for short-term transport of the product
Weight	0.2 kg (0.4 lbs.)
Compliance	UL, CE

<I> Install the option in an environment compatible with the drive environmental specifications.

## 8 Standards Compliance

### ◆ Section Safety

#### DANGER

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

**Do not examine, connect, or disconnect wiring on an energized drive.**

Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe.

Failure to obey will cause death or serious injury.

#### WARNING

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

**Do not operate equipment with covers removed.**

Failure to obey could cause death or serious injury.

Figures in this manual can show options and drives without covers or safety shields. Install covers and safety shields before operating the option or drive. Use the option as shown in this manual.

**Always ground the motor-side grounding terminal.**

Contacting the motor case can cause death or serious injury from incorrect equipment grounding.

### **WARNING**

**Do not touch any terminals before the capacitors have fully discharged.**

Failure to obey could result in death or serious injury.

Before wiring terminals, disconnect all power to the equipment. The capacitor for the control power supply remains charged even after the power supply is turned off. After shutting off the power, wait for at least the amount of time specified on the drive before touching any components.

**Only let authorized persons install, wire, maintain, examine, replace parts, and repair the drive and option.**

Failure to obey can cause death or serious injury.

**Do not perform work on the drive while wearing loose clothing or jewelry.**

Failure to obey could cause death or serious injury. Before servicing, secure loose clothing and remove all metal objects such as watches or rings.

**Do not make changes to the drive body or drive circuitry.**

Failure to obey could cause death or serious injury and will void warranty. Yaskawa is not responsible for changes to the product made by the user.

**WARNING****Fire Hazard****Tighten all terminal screws to the correct tightening torque.**

Connections that are too loose or too tight can cause incorrect operation and damage to the drive. Incorrect connections can also cause death or serious injury from fire.

**Do not use an improper voltage source.**

Failure to obey could cause death or serious injury by fire. Verify that the rated voltage of the drive matches the voltage of the incoming power supply before energizing the drive.

**Do not use combustible materials to mount the drive, harmonic filter module, or option.**

Failure to obey could cause death or serious injury by fire. Attach the drive, harmonic filter module, and option to metal or other noncombustible material.

**NOTICE****Observe correct electrostatic discharge (ESD) procedures when touching the option, drive, and circuit boards.**

Failure to obey can cause ESD damage to the drive circuitry.

**Do not connect or disconnect the motor from the drive while the drive is supplying voltage.**

Incorrect equipment sequencing can cause damage to the drive.

**Do not use unshielded wire for control wiring.**

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

Failure to obey can cause electrical interference and unsatisfactory system performance.

### NOTICE

**Make sure that all connections are correct after installing the drive and connecting peripheral devices.**

Failure to obey can cause damage to the drive.

**After blowing a fuse or tripping an Earth Leakage Circuit Breaker (ELCB), wait at least 5 minutes and make sure that the CHARGE lamp is off before starting the drive again or operating the peripheral devices.**

Check the wiring and peripheral devices to identify the problem. Contact your supplier before starting the drive or peripheral devices if the cause cannot be identified.

### ◆ UL Standards



Figure 38 UL/cUL Mark

The UL/cUL mark applies to products in the United States and Canada and it means that UL has performed product testing and evaluation and determined that their stringent standards for product safety have been met. For a product to receive UL certification, all components inside that product must also receive UL certification.

### ■ UL Standards Compliance

This product is evaluated in accordance with UL standard UL508C and complies with UL requirements.

#### **Installation Area**

Do not install the product in a pollution degree 3 or 4 area (UL standard).

#### **Ambient Temperature**

IP00 enclosure: -10°C to +50°C

IP20/UL Type 1 enclosure: -10°C to +40°C

#### **Low Voltage Wiring for Control Circuit Terminals**

Wire low voltage wires with NEC Class 1 circuit conductors. Refer to national, state, or local codes for wiring. The external power supply shall be a UL Listed Class 2 power supply source or equivalent only.

Input: External power supply

Terminal Signal: 24, 0, FE

Power Supply Specifications: Requires class 2 power supply.

### ◆ European Standards



Figure 39 CE Mark

The CE mark identifies products that comply with applicable European Directives for safety and environmental regulations.

It is required for engaging in business and commerce in Europe.

The applicable European Directives for this product are in the following table.

Yaskawa declared the CE mark based on the harmonized standards in the following table.

Applicable European Directive	Applicable Harmonized Standards
Low Voltage Directive (2006/95/EC)	IEC/EN 61800-5-1: 2007
EMC Guidelines (2004/108/EC)	EN 61800-3: 2004/A1: 2012 IEC 61800-3: 2004/A1: 2011

The user is responsible to make sure that the end products used with this product comply with all applicable European directives and other national regulations (if required).

#### ■ CE Low Voltage Directive Compliance

Yaskawa tested this product according to European standard IEC/EN 61800-5-1:2007. The product fully complies with the Low Voltage Directive.

Meet the following condition when using this product with other devices to comply with the Low Voltage Directive:

##### Area of Use

Do not use the product in areas with pollution degree 3 or 4 or overvoltage category 3 in accordance with IEC/EN 60664.



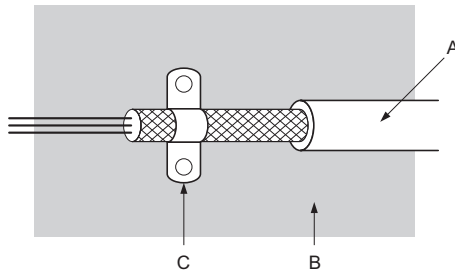
### ■ EMC Guidelines Compliance

Yaskawa tested this option according to European standards EN 61800-3:2004/A1:2012. The option complies with EMC guidelines. Yaskawa declared the CE mark based on the harmonized standards.

#### Installation Method

Install the option with the following conditions to make sure that other devices and machinery used with this option also comply with EMC guidelines.

1. Use dedicated shield cable for the option and external device, or put the wiring through a metal conduit.
2. Keep wiring as short as possible and ground the largest possible surface area of the shield to the metal panel according to [Figure 40](#).



A – Braided shield cable  
B – Metal panel

C – Cable clamp (conductive)

Figure 40 Ground Area

# 9 Warranty Information

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### ◆ Warranty Period

This product is warranted for 12 months from the date of delivery to the customer or 18 months from the date of shipment from the Yaskawa factory, whichever comes first.

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### ◆ Scope of Warranty

#### ■ Inspections

Customers are responsible for periodic inspections of the product. Upon request, a Yaskawa representative will inspect the product for a fee. If the Yaskawa representative finds the product to be defective due to Yaskawa workmanship or materials and the defect occurs during the warranty period, this inspection fee will be waived and the problem remedied free of charge.

#### ■ Repairs

If a Yaskawa product is found to be defective due to Yaskawa workmanship or materials and the defect occurs during the warranty period, Yaskawa will provide a replacement, repair the defective product, and provide shipping to and from the site free of charge.

However, if the Yaskawa Authorized Service Center determines that the problem with the product is not due to defective workmanship or materials, the customer will be responsible for the cost of any necessary repairs. Some problems that are outside the scope of this warranty are:

- Problems due to improper maintenance or handling, carelessness, or other reasons where the customer is determined to be responsible.
- Problems due to additions or modifications made to a Yaskawa product without Yaskawa's understanding.
- Problems due to the use of a Yaskawa product under conditions that do not meet the recommended specifications.
- Problems caused by natural disaster or fire.
- After the free warranty period elapses.
- Replenishment or replacement of consumables or expendables.
- Defective products due to packaging or fumigation.
- Malfunction or problems caused by program that has been made by customers using DriveWorksEZ.
- Other problems not due to defects in Yaskawa workmanship or materials.

Warranty service is only applicable within the country where the product was purchased. However, after-sales service is available for customers outside the country where the product was purchased for a reasonable fee.

Contact your local Yaskawa representative for more information.

### ■ Exceptions

Any inconvenience to the customer or damage to non-Yaskawa products due to Yaskawa's defective products whether within or outside of the warranty period are NOT covered by warranty.

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### ◆ Restrictions

This product was not designed or manufactured for use in devices or systems that may directly affect or threaten human lives or health.

Customers who intend to use the product described in this manual for devices or systems relating to transportation, health care, space aviation, atomic power, electric power, or in underwater applications must first contact their Yaskawa representatives or the nearest Yaskawa sales office.

This product has been manufactured under strict quality-control guidelines. However, if this product is to be installed in any location where failure of this product could involve or result in a life-and-death situation or loss of human life or in a facility where failure may cause a serious accident or physical injury, safety devices must be installed to minimize the likelihood of any accident.

## 9 Warranty Information

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### ◆ Revision History

Revision dates and manual numbers appear on the bottom of the back cover.

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# YASKAWA U1000-Series Option 24 V Power Supply Installation Manual

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# YASKAWA

**YASKAWA ELECTRIC CORPORATION**

In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.

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

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