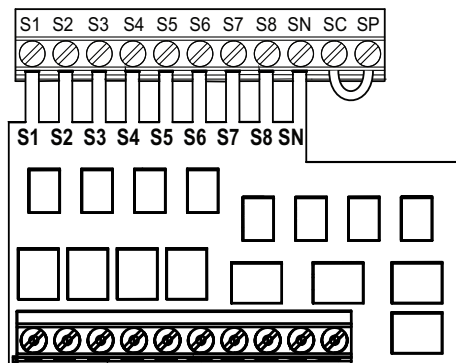


YASKAWA AC Drive Option DI-101 120 Vac Interface Option Installation Manual

PCB PN:

UTC000450, RB



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1 Preface and Safety

YASKAWA Electric supplies component parts for use in a wide variety of industrial applications. The selection and application of YASKAWA products remain the responsibility of the equipment designer 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 products designed to incorporate a component part 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 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

Document	Description
Yaskawa AC Drive Manuals	<p>Refer to the manual packaged with the drive for basic information about the drive.</p> <p>Refer to the Technical Reference for more information about programming and parameter settings.</p> <p>You can download the Technical Reference from the Yaskawa website shown on the back cover of this manual.</p>

◆ Glossary

Terminology Used in this Document	Description
Drive	YASKAWA AC Drive A1000 and GA800
Option	YASKAWA AC Drive DI-101 120 Vac Interface Option.

2 General Safety

◆ Supplemental Safety Information

⚠ DANGER This signal word identifies a hazard that will cause serious injury or death if you do not prevent it.

⚠ WARNING This signal word identifies a hazard that can cause death or serious injuries if you do not prevent it.

⚠ CAUTION This signal word identifies a hazardous situation, which, if not avoided, can cause minor or moderate injury.

NOTICE This signal word identifies a property damage message that is not related to personal injury.

◆ Section Safety

General Precautions

- Some figures in the instructions include options and drives without covers or safety shields to more clearly show the inside of the drive. Replace covers and shields before operation. Use options and drives only as specified by the instructions.
- The figures in this manual are examples only. All figures do not apply to all products included in this manual.
- Yaskawa can change the products, specifications, and content of the instructions without notice to make the product and/or the instructions better.
- If you damage or lose these instructions, contact a Yaskawa representative or the nearest Yaskawa sales office on the rear cover of the manual, and tell them the document number on the front cover to order new copies.

⚠ 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. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.

⚠ WARNING **Electrical Shock Hazard.** Only let approved personnel install, wire, maintain, examine, replace parts, and repair the drive. If personnel are not approved, it can cause serious injury or death.

⚠ WARNING **Sudden Movement Hazard.** Tighten the screws to the specified tightening torque. Incorrect tightening torques can cause damage to equipment and cause serious injury or death from falling equipment.

⚠ CAUTION **Burn Hazard.** Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.

NOTICE **Damage to Equipment.** When you touch the drive and circuit boards, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.

3 Overview

The DI-101 option has eight optically isolated input terminals that you can use to connect external 120 Vac control circuitry to an A1000 or GA800 drive. The DI-101 option mounts directly to drive control board terminals S1-S8 and SN. This option makes it possible to control the drive digital inputs with 120 Vac.

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

◆ Applicable Models

Table 3.1 Applicable Models

Drive Series	Drive Model Number
A1000	All models (excluding A1000 HHP models)
GA800	All models

4 Receiving

Please do these tasks after you receive the option:

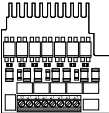
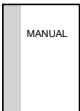
- Make sure that there is no damage to the option and no parts are missing.
The Yaskawa warranty does not include damage from shipping. If there is damage to the option or other parts, contact the shipping company immediately.

NOTICE *Damage to Equipment. Do not use damaged parts to connect the drive and the option. Failure to comply could damage the drive and option.*

- Make sure that the model number on the option nameplate and the model number on the purchase order are the same.
- Contact the distributor where you purchased the option or contact Yaskawa or a Yaskawa representative about any problems with the option.

◆ Option Package Contents

Table 4.1 Contents of Package

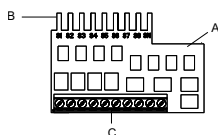
Description	Option PCB in ESD Bag PN: UTC000450, RB	Installation
—		
Quantity	1	1

◆ Required Tools

A flat blade screwdriver (#1) with a blade thickness of 0.4 mm or less and a blade width of 2.5 mm or less is required to install the option.

5 Option Components

◆ DI-101 Option



A - DI-101 120 Vac Interface Card


B - Option terminals (to drive)

C - Option terminal block (to control wiring)

Figure 5.1 DI-101 Option

◆ Option Terminal Block

Table 5.1 Option Terminal Functions

DI-101 Option Terminal Block	Terminal	Signal Function	Description	Signal Level
	S1	Forward Run / Stop ^{<i>*1</i>}	Forward run when closed, stop when open. <i>[H1-01]</i>	120 Vac ±10%
	S2	Reverse Run / Stop ^{<i>*1</i>}	Reverse run when closed, stop when open. <i>[H1-02]</i>	
	S3	Multi-function Input ^{<i>*1</i>}	Multi-function contact inputs <i>[H1-03 to H1-07]</i>	
	S4	Multi-function Input ^{<i>*1</i>}		
	S5	Multi-function Input ^{<i>*1</i>}		
	S6	Multi-function Input ^{<i>*1</i>}		
	S7	Multi-function Input ^{<i>*1</i>}		
	S8	Multi-function Input ^{<i>*1</i>}		
	X2	Common	Control Input Common	
	X2	Common (spare)	Control Input Common	

^{*1} Parameter functions and defaults change based on drive programming.

6 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, measure for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ WARNING *Electrical Shock Hazard. Do not operate the drive when covers are missing. Replace covers and shields before you operate the drive. Use the drive only as specified by the instructions. Some figures in this section include drives without covers or safety shields to more clearly show the inside of the drive. If covers or safety shields are missing from the drive, it can cause serious injury or death.*

⚠ WARNING *Electrical Shock Hazard. Only let approved personnel install, wire, maintain, examine, replace parts, and repair the drive. If personnel are not approved, it can cause serious injury or death.*

⚠ WARNING *Electrical Shock Hazard. Do not remove covers or touch circuit boards while the drive is energized. If you touch the internal components of an energized drive, it can cause serious injury or death.*

⚠ WARNING *Electrical Shock Hazard. Do not use damaged wires, put too much force on the wiring, or cause damage to the wire insulation. Damaged wires can cause serious injury or death.*

⚠ 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. When you touch the option, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.*

NOTICE *Damage to Equipment. Do not de-energize the drive while the drive is outputting voltage. Incorrect equipment sequencing can cause damage to the drive.*

NOTICE *Do not operate a drive or connected equipment that has damaged or missing parts. You can cause damage to the drive and connected equipment.*

NOTICE *Use Yaskawa connection cables or recommended cables only. Incorrect cables can cause the drive or option to function incorrectly.*

NOTICE *Damage to Equipment. Correctly connect the connectors. Incorrect connections can cause malfunction or damage to the equipment.*

NOTICE *Damage to Equipment. Make sure that all connections are correct after you install the drive and connecting peripheral devices. Incorrect connections can cause damage to the option.*

◆ Procedures to Install and Wire Options on a Drive

Refer to the following table to check the procedures to install and wire the option on a drive.

Table 6.1 Applicable Models

Drive Series	Installation Procedure	Reference Page
A1000	All models (excluding A1000 HHP models)	10
GA800	All models	18

◆ Procedure A

This section shows the procedure to install and wire the option on a 1000-series drive.

■ Prior to Installing the Option

Prior to installing the option, wire the drive, make the necessary connections to the drive terminals, and verify that the drive functions normally. Refer to the Quick Start Guide packaged with the drive for information on wiring and connecting the drive.

Figure 6.1 is an exploded view of the drive with the option and related components for reference.

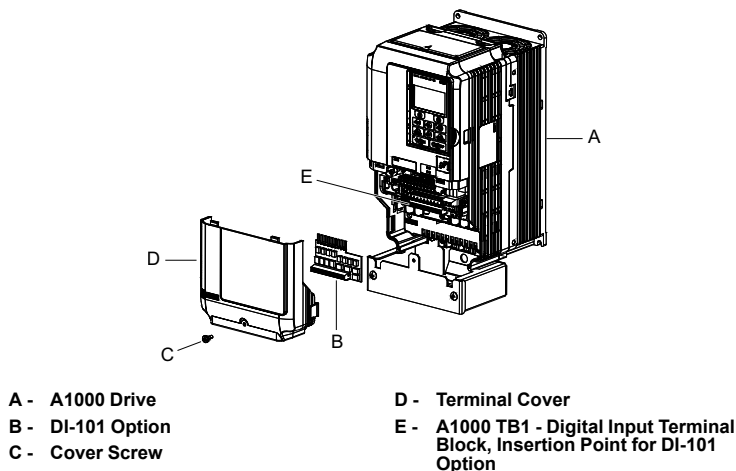


Figure 6.1 Drive Components with Option

■ Installing the Option (Procedure A)

Refer to the following instructions to install the option.

1. Shut off power to the drive, wait the appropriate amount of time for voltage to dissipate. Remove the terminal cover screw (C) then remove the terminal cover (D). Refer to the Quick Start Guide packaged with the drive for directions on removing the cover. Cover removal varies depending on drive size.

⚠ DANGER *Electrical Shock Hazard.. Disconnect all power to the drive and wait at least the amount of time specified on the drive front cover safety label. 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.*

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.*

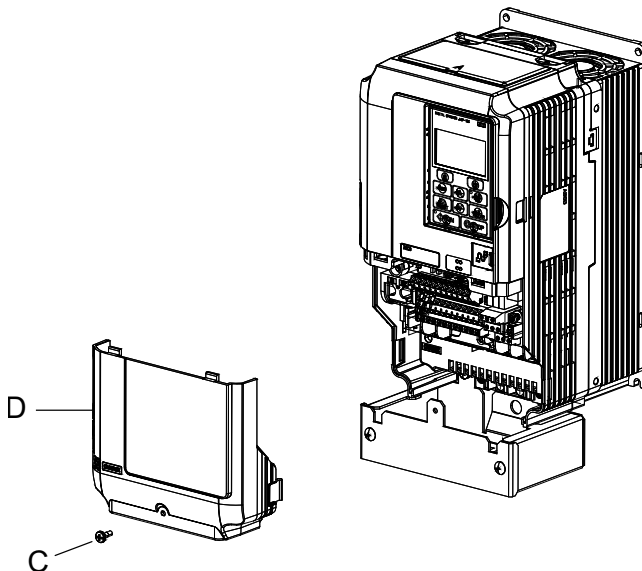


Figure 6.2 Terminal Cover Removal

2. Loosen terminals S1 to S8 and SN on the A1000 drive digital Input terminal block.

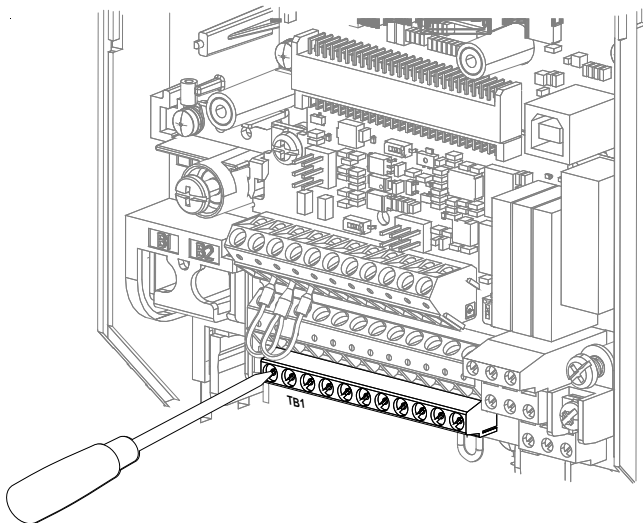


Figure 6.3 Loosen Drive Control Terminals TB1 S1 to S8 and SN

3. Remove the DI-101 option from the ESD bag.

NOTICE When handling printed circuit boards (PCB) always use electrostatic discharge (ESD) protection. Keep the boards in the ESD bag as long as you can. Do not lay the board on any surfaces without the ESD protection. When handling, always hold the board from the edges and do not touch the components. Before installing this option, a technically qualified individual, familiar with this type of equipment and the hazards involved, should read this entire installation guide.

4. Insert the DI-101 option (B) into the A1000 drive control terminals TB1, S1 to S8 and SN at the insertion point (E). Refer to for the proper placement of the option terminals into the drive TB1 terminals. Secure the DI-101 option by tightening the TB1 terminals S1 to S8 and SN. Refer [Wire Gauges](#), [Tightening Torques](#), and

Crimp Terminals on page 26 to confirm that the proper tightening torque is applied to each terminal.

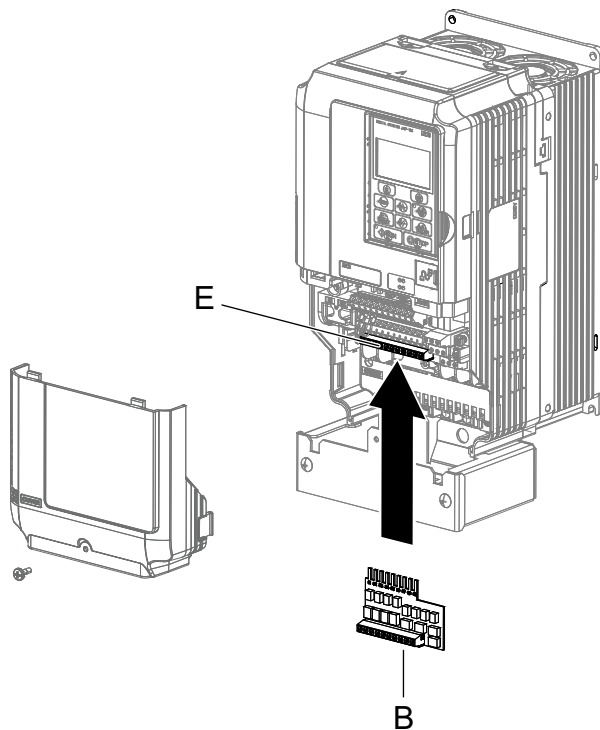


Figure 6.4 DI-101 Option Insertion into TB1

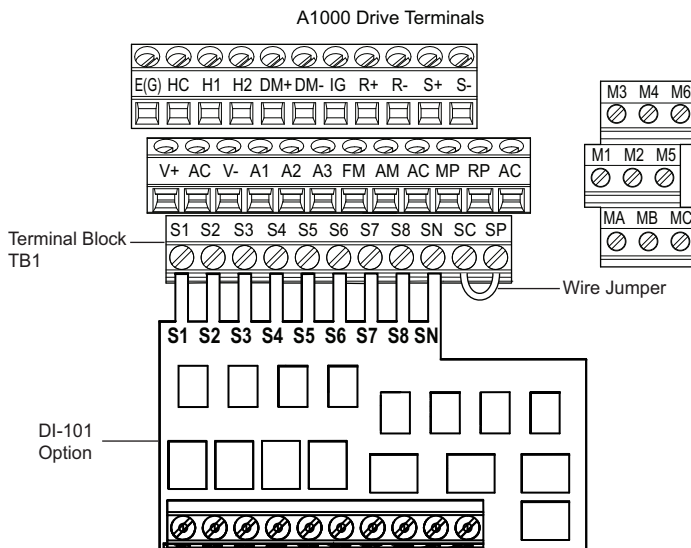


Figure 6.5 DI-101 Option to Drive Connection

5. Ensure the factory installed wire jumper is present between TB1 terminals SC to SP. If no wire jumper is present, prepare and install a jumper according to [Figure 6.6](#). Route the customer-supplied option wiring through one of the cable glands on the A1000 drive bottom conduit bracket.

6. Prepare the external 120 Vac control circuit wires (customer supplied) for terminals S1 to S8 and X2 on the DI-101 option as shown in [Figure 6.6](#).

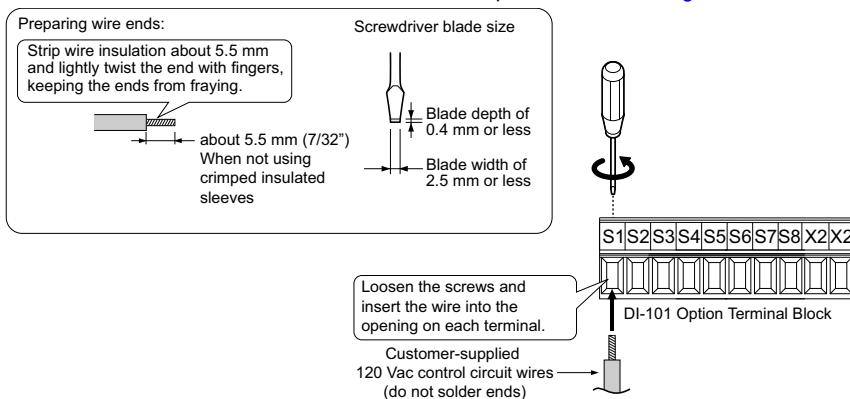


Figure 6.6 Preparing Cable Wiring

7. Connect the customer wiring to the DI-101 option terminal block. Refer to [Figure 6.7](#) for a wiring diagram example showing customer interface circuitry. Refer to [Wire Gauges, Tightening Torques, and Crimp Terminals on page 26](#) to confirm that the proper tightening torque is applied to each terminal. Take particular precaution to ensure each wire is properly connected and wire insulation is not accidentally pinched into electrical terminals.

⚠ WARNING *Fire Hazard.. Tighten terminal screws to the specified tightening torque. Loose electrical connections could result in death or serious injury by fire due to overheating. Tightening screws beyond the specified tightening torque may cause erroneous operation, damage the terminal block, or cause a fire.*

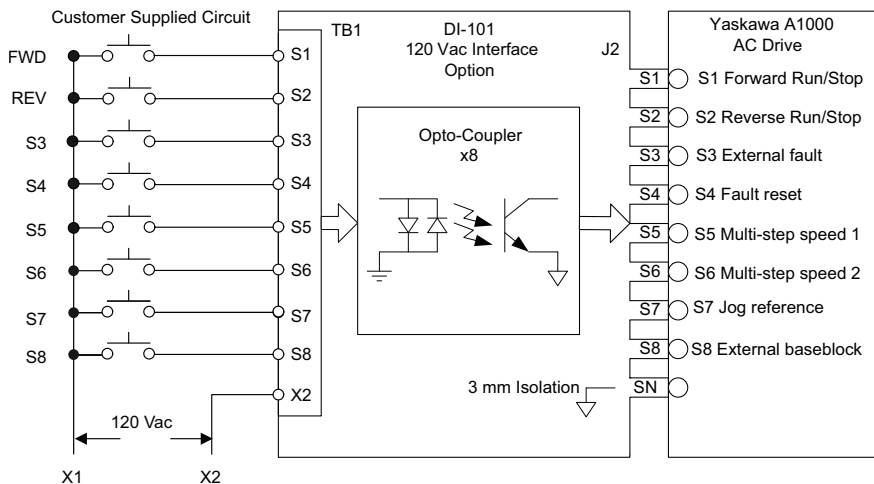


Figure 6.7 Wiring Diagram Example

To ensure accurate control, use a stable 120 Vac power supply for the DI-101 input voltage source.

8. Replace terminal cover (D) and secure screw (C).

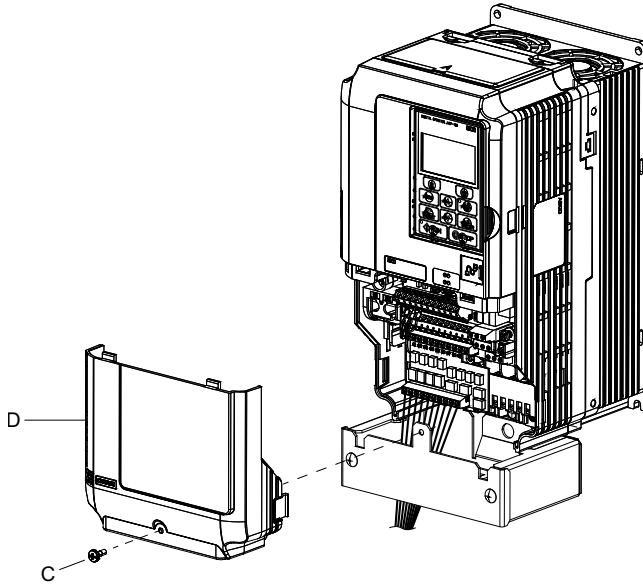


Figure 6.8 Replace the Terminal Cover

◆ Procedure B

This section shows the procedure to install and wire the option on a GA800 drive.

■ Prior to Installing the Option

Prior to installing the option, wire the drive, make the necessary connections to the drive terminals, and verify that the drive functions normally. Refer to the Installation & Primary Operation manual packaged with the drive for information on wiring and connecting the drive.

Figure 6.9 is an exploded view of the drive with the option and related components for reference.

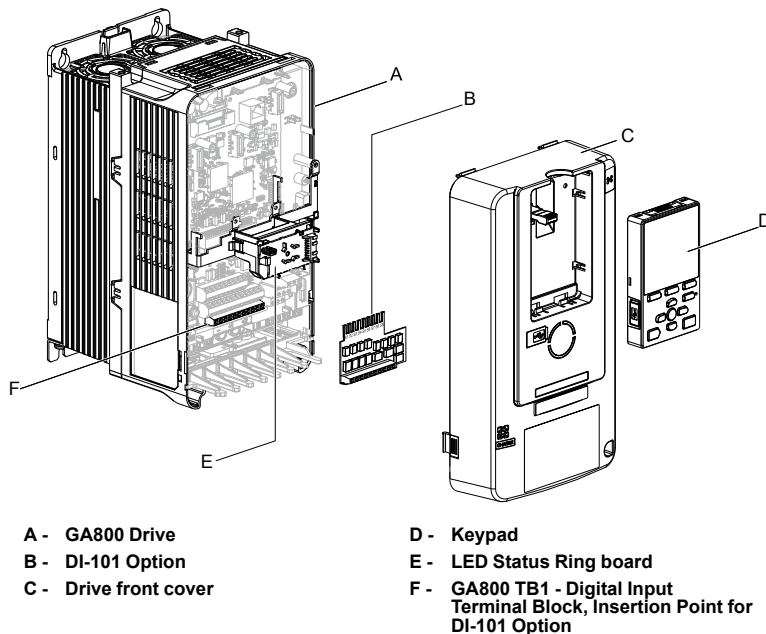


Figure 6.9 Drive Components with Option

■ Installing the Option (Procedure B)

Refer to the following instructions to install the option.

1. Remove the keypad (D) and front cover (C).

Shut off power to the drive and wait for the time specified on the drive warning label at a minimum. Make sure that the charge indicator LED is unlit, then remove the keypad and front cover. Refer to the drive manuals for more information. This option can only be installed into the CN5-A connector on the drive control board.

⚠ DANGER

Electrical Shock Hazard.. Disconnect all power to the drive and wait at least the amount of time specified on the drive front cover safety label. 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.

NOTICE

Damage to Equipment. When you touch the option, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.

Note:

Remove the keypad, then move the keypad connector to the holder on the drive, then remove the front cover.

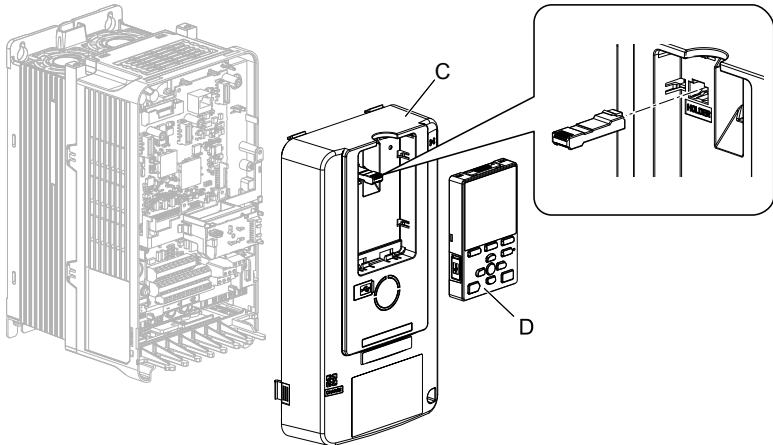


Figure 6.10 Remove the Front Cover and Keypad

2. Carefully remove the LED Status Ring board (E) and put it in the temporary placement holes (G) on the right side of the drive. Refer to the drive manuals for more information.

NOTICE

Do not remove the LED Status Ring board cable connector. If you disconnect the LED Status Ring board, it can cause incorrect operation and damage to the drive.

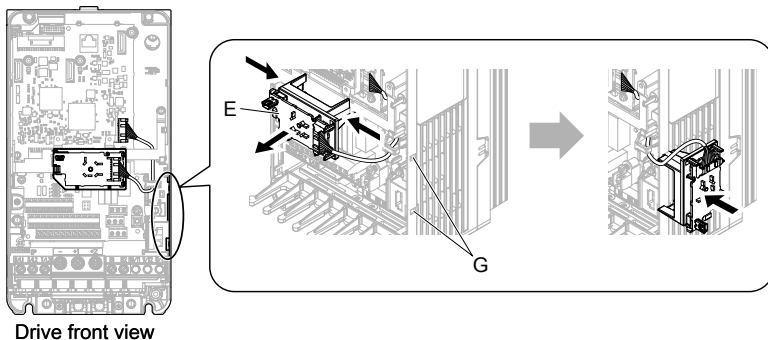


Figure 6.11 Remove the LED Status Ring Board

3. Loosen terminals S1 to S8 and SN on the GA800 drive digital Input terminal block.

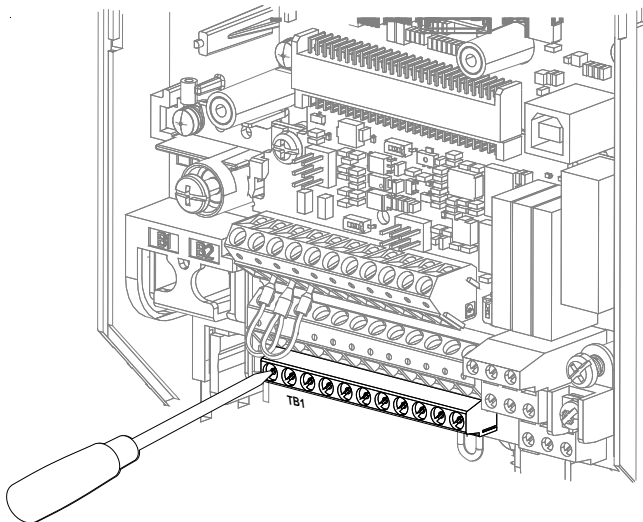


Figure 6.12 Loosen Drive Control Terminals TB1 S1 to S8 and SN

4. Remove the DI-101 option from the ESD bag.

NOTICE When handling printed circuit boards (PCB) always use electrostatic discharge (ESD) protection. Keep the boards in the ESD bag as long as you can. Do not lay the board on any surfaces without the ESD protection. When handling, always hold the board from the edges and do not touch the components. Before installing this option, a technically qualified individual, familiar with this type of equipment and the hazards involved, should read this entire installation guide.

5. Insert the DI-101 option (B) into the GA800 drive control terminals TB1, S1 to S8 and SN at the insertion point (F). Refer to [Figure 6.13](#) for the proper placement of the option terminals into the drive TB1 terminals. Secure the DI-101 option by tightening the TB1 terminals S1 to S8 and SN. Refer [Wire Gauges, Tightening Torques, and Crimp Terminals on page 26](#) to confirm that the proper tightening torque is applied to each terminal.

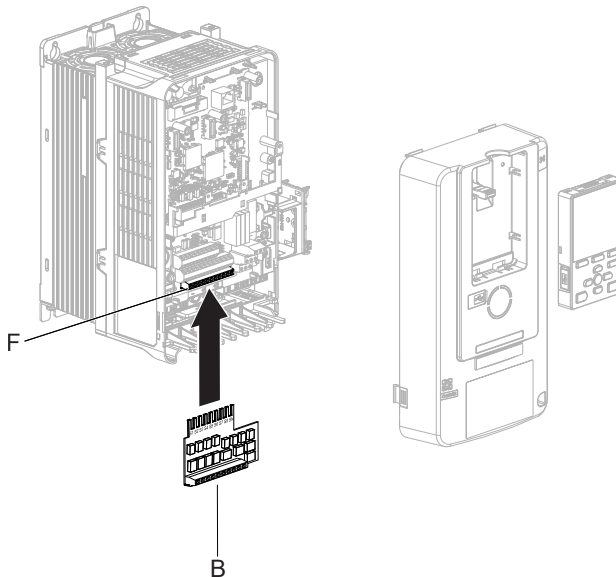


Figure 6.13 DI-101 Option Insertion into TB1

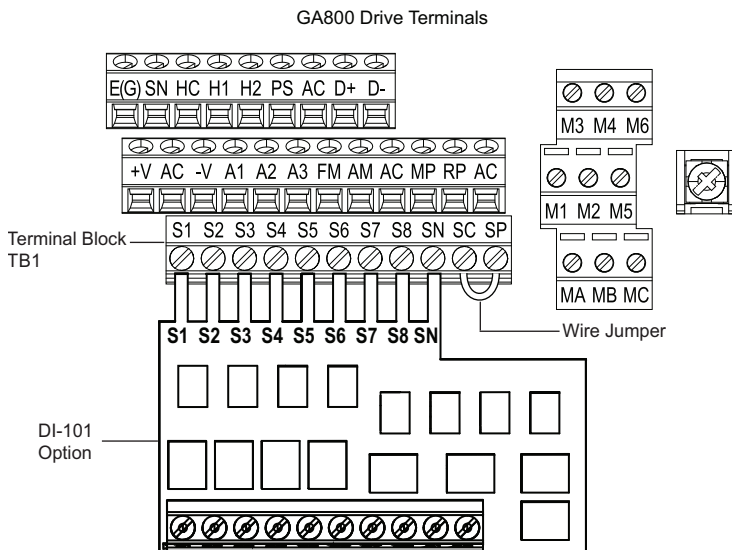


Figure 6.14 DI-101 Option to Drive Connection

6. Ensure the factory installed wire jumper is present between TB1 terminals SC to SP. If no wire jumper is present, prepare and install a jumper according to [Figure 6.15](#). Route the customer-supplied option wiring through one of the cable glands on the GA800 drive bottom conduit bracket.

7. Prepare the external 120 Vac control circuit wires (customer supplied) for terminals S1 to S8 and X2 on the DI-101 option as shown in [Figure 6.15](#).

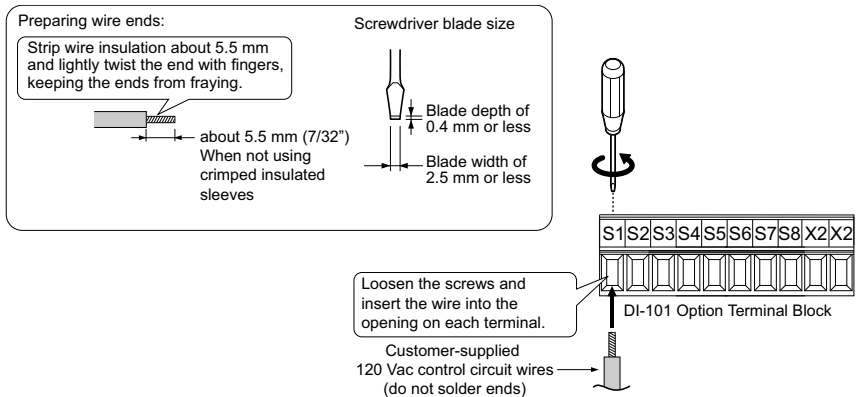


Figure 6.15 Preparing Cable Wiring

8. Connect the customer wiring to the DI-101 option terminal block. Refer to [Figure 6.16](#) for a wiring diagram example showing customer interface circuitry. Refer to [Wire Gauges, Tightening Torques, and Crimp Terminals on page 26](#) to confirm that the proper tightening torque is applied to each terminal. Take particular precaution to ensure each wire is properly connected and wire insulation is not accidentally pinched into electrical terminals.

⚠ WARNING *Fire Hazard.. Tighten terminal screws to the specified tightening torque. Loose electrical connections could result in death or serious injury by fire due to overheating. Tightening screws beyond the specified tightening torque may cause erroneous operation, damage the terminal block, or cause a fire.*

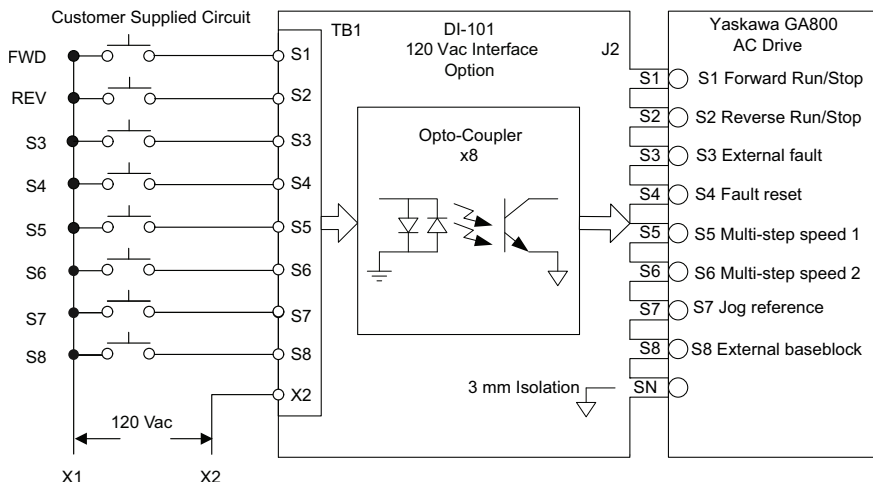


Figure 6.16 Wiring Diagram Example

To ensure accurate control, use a stable 120 Vac power supply for the DI-101 input voltage source.

9. Reattach the LED Status Ring board (E), front cover (C), and keypad (D). Refer to the drive manuals for more information.

NOTICE Do not pinch cables between the front cover or the LED Status Ring board and the drive. Failure to comply could cause erroneous operation.

Note:

- Replace the keypad connector then install the keypad.
- Put the keypad connector tab into the holder when you install the keypad connector to the holder.

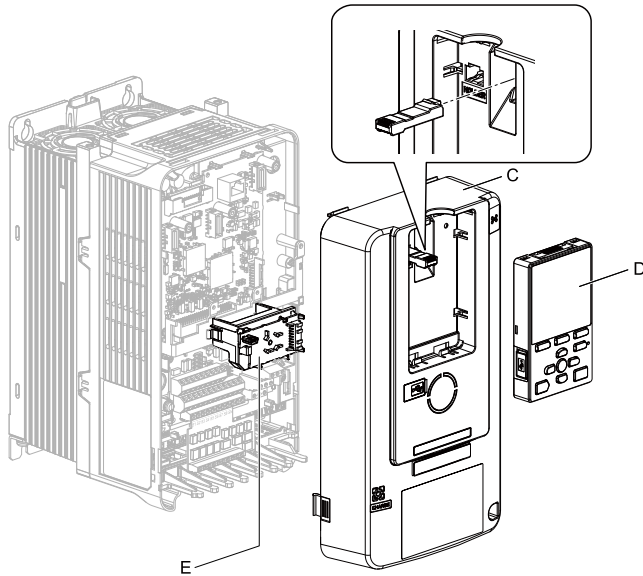


Figure 6.17 Install the LED Status Ring board, Front Cover, and Keypad

◆ Wire Gauges, Tightening Torques, and Crimp Terminals

■ Wire Gauges and Tightening Torques

Wire gauge and torque specifications are listed in [Table 6.2](#)

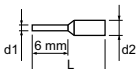
Table 6.2 Wire Gauges and Tightening Torques

Terminal Signal	Screw Size	Tightening Torque N.m (in.lb)	Bare Cable		Crimp Terminals		Wire Type
			Applicable Gauges (mm ²)	Recomm. Gauges (mm ²)	Applicable Gauges (mm ²)	Recomm. Gauges (mm ²)	
S1 to S8 and X2	M2	0.22 to 0.25 (1.95 to 2.21)	Stranded wire: 0.25 to 1.0 (24 to 17 AWG) Solid wire: 0.25 to 1.5 (24 to 16 AWG)	0.75 (18 AWG)	0.25 to 0.5 (24 to 20 AWG)	0.5 (20 AWG)	Stranded or solid

■ Crimp Terminals

Yaskawa recommends using CRIMPFOX 6 by Phoenix Contact or equivalent crimp terminals with the specifications listed in [Table 6.3](#)

Table 6.3 Wire Gauges and Tightening Torques

	Wire Gauge mm ²	Phoenix Contact Model	L mm (in)	d1 mm (in)	d2 mm (in)
	0.25 (24 AWG)	AI 0.25 - 6YE	10.5 (13/32)	0.8 (1/32)	2 (5/64)
	0.34 (22 AWG)	AI 0.34 - 6TQ	10.5 (13/32)	0.8 (1/32)	2 (5/64)
	0.5 (20 AWG)	AI 0.5 - 6WH	14 (9/16)	1.1 (3/64)	2.5 (3/32)

7 Troubleshooting

Troubleshooting tips are provided below. Verify these points if the drive performance is not as expected after installing the option:

- Verify all wire connections are tight.
- Verify all DI-101 PCB Fingers are fully inserted into the drive terminals and the terminals are fully tightened.
- Verify that the factory installed wire jumper is installed between TB1 terminals SC to SP.
- Verify the signal is present at the DI-101 option input terminals by using an AC voltmeter to measure for a 120 Vac input signal is present on any activated terminals S1 thru S8 with respect to the X2 terminal.
- Verify the digital input is recognized by the drive by viewing Input Terminal Status monitor parameter U1-10.
- Verify the drive Multi-Function Digital Input parameters (H1-01 through H1-08) of the drive are set correctly for the expected S1 to S8 input terminal behavior.

◆ Preventing Noise Interference

Take the following steps to prevent erroneous operation caused by conducted electrical noise interference:

- Use shielded wire for the signal lines less than 24 V.
- Limit the length of I/O signal wiring to less than 50 m (164 ft).
- Use separate conduits or cable tray separation for 120 Vac control wiring, DC signal and other I/O wiring, main circuit power lines.
- Use noise suppression on relay coils.
- Ensure adequate system and drive grounding.

8 Specifications

Table 8.1 Option Specifications

Specification	Data
Inputs	8 Digital Inputs , +2 Neutral Common
Input Impedance	10 Kohms
On-State Voltage	93 to 132 Vac (110/120 Vac +10 % / -15%)
On-State Current, Nominal	12.5 mA @ 120 Vac
Off-State Voltage, Maximum	19 Vac
Off-State Leakage Current, Maximum	4.0 mA
Operating Frequency	57 to 63 Hz (+/- 15%)
On-State Response Time, Maximum	50 ms
Off-State Response Time, Maximum	50 ms
Terminal Wiring	16 AWG to 26 AWG
Area of Use	Indoors
Operating Temperature	-10 to +60 °C
Storage Temperature	-20 to +5 °C (short-term temperature during transport)
Humidity	95% Relative Humidity or less (non-condensing)

Revision History

Date of Publication	Revision Number	Section	Revised Content
December 2025	-	-	First Edition

YASKAWA AC Drive Option

DI-101 120 Vac Interface

Option

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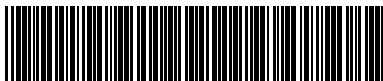
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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and 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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