YASKAWA

YASKAWA 1000-Series Option

Digital Output
Installation Manual

Type DO-A3

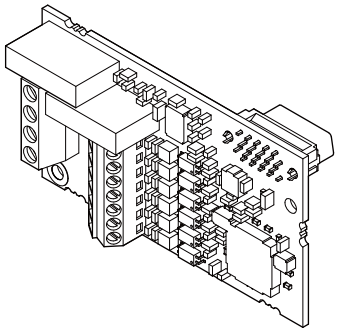
To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.

安川 1000シリーズ オプション

ディジタル出力
取扱説明書

形式 DO-A3

製品を安全にお使い頂くために，この取扱説明書を必ずお読みください。
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。



MANUAL NO. TOBP C730600 41F

Copyright © 2008 YASKAWA ELECTRIC CORPORATION

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, mechanical, electronic, photocopying, recording, or otherwise, without the prior written permission of Yaskawa. No patent liability is assumed with respect to the use of the information contained herein. Moreover, because Yaskawa is constantly striving to improve its high-quality products, the information contained in this manual is subject to change without notice. Every precaution has been taken in the preparation of this manual. Yaskawa assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained in this publication.

Table of Contents

1 PREFACE AND SAFETY 4
2 PRODUCT OVERVIEW 7
3 RECEIVING 8
4 OPTION COMPONENTS 9
5 INSTALLATION PROCEDURE 10
6 RELATED PARAMETERS 23
7 TROUBLESHOOTING 27
8 SPECIFICATIONS 29

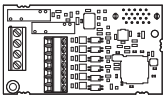
1 Preface and Safety

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.

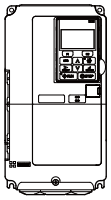
◆ Applicable Documentation

The following manuals are available for the option:

Digital Output DO-A3 Option

	**Yaskawa 1000-Series Option Digital Output DO-A3 Installation Manual (This book) Manual No: TOBP C730600 41**	Read this manual first. The installation manual is packaged with the option and contains information required to install the option and set up related unit parameters.

Unit

	**Yaskawa AC Drive 1000-Series Quick Start Guide**	The unit manuals cover basic installation, wiring, operation procedures, functions, troubleshooting, and maintenance information. The manuals also include important information about parameter settings and unit tuning. Access these sites to obtain Yaskawa instruction manuals: U.S.: http://www.yaskawa.com Europe: http://www.yaskawa.eu.com Japan: http://www.e-mechatronics.com Other areas: contact a Yaskawa representative.
	Yaskawa AC Drive 1000-Series Technical Manual	
	Yaskawa D1000 Series Power Regenerative Converter Instruction Manual	
	Yaskawa R1000 Series Power Regenerative Unit Instruction Manual	

◆ Terms

Note:	Indicates supplemental information that is not related to safety messages
Option:	Yaskawa 1000-Series Option Digital Output DO-A3
Unit:	• Yaskawa AC Drive 1000-Series • Yaskawa D1000 Series Power Regenerative Converter • Yaskawa R1000 Series Power Regenerative Unit
Energy-Saving Unit:	• Yaskawa D1000 Series Power Regenerative Converter • Yaskawa R1000 Series Power Regenerative Unit

◆ Registered Trademarks

Trademarks are the property of their respective owners.

◆ Supplemental Safety Information

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

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

Indicates an equipment damage message.

■ General Safety

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

⚠ DANGER

Heed the safety messages in this manual.

Failure to comply will result in death or serious injury.

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

NOTICE

Do not modify the unit or option circuitry.

Failure to comply could result in damage to the unit 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 unit or option to halogen group disinfectants.

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

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

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

2 Product Overview

◆ About This Product

The Digital Output Option DO-A3 allows the user to expand the number of available digital outputs to monitor unit run status.

The option has the following features:

- Six photocoupler outputs (48 V, 50 mA or less)
- Two relay outputs (250 Vac, 1 A or less; 30 Vdc, 1 A or less)

◆ Applicable Models

The option can be used with the unit models in ***Table 1***.

Table 1 Applicable Models

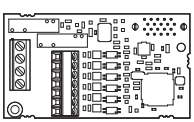
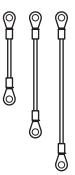
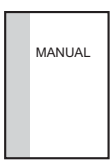
Unit Series	Unit Model Number
A1000	All models
L1000A	All models
D1000	All models
R1000	All models

3 Receiving

Please perform the following tasks upon receiving the option:

- Inspect the option for damage. Contact the shipper immediately if the option appears damaged upon receipt.
- Verify receipt of the correct model by checking the model number printed on the option nameplate. (Refer to ***Figure 1*** on page ***9*** for more information)
- Contact your supplier if you have received the wrong model or the option does not function properly.

◆ Option Package Contents

Description:	Option	Ground Wires	Screws (M3)	Installation Manual
–				
Quantity:	1	3	3	1

◆ Tools Required for Installation

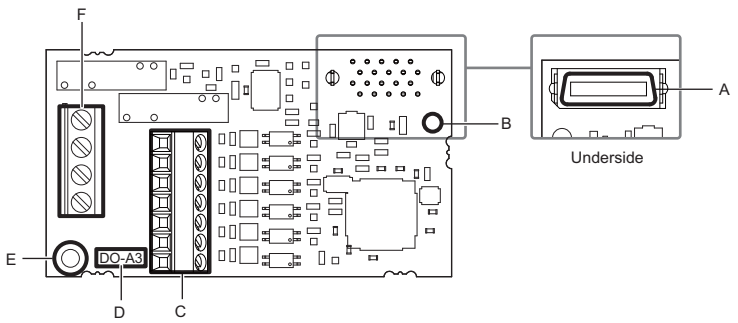
- A Phillips screwdriver (M3 metric/#1, #2 U.S. standard size <1>) is required to install the option.
- A straight-edge screwdriver (blade depth: 0.4 mm, width: 2.5 mm) is required to wire the option terminal block.
- A pair of diagonal cutting pliers. (required for some unit models)
- A small file or medium grit sandpaper. (required for some unit models)

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

<1> Select a screwdriver appropriate for the unit capacity.

4 Option Components

◆ Digital Output DO-A3 Option

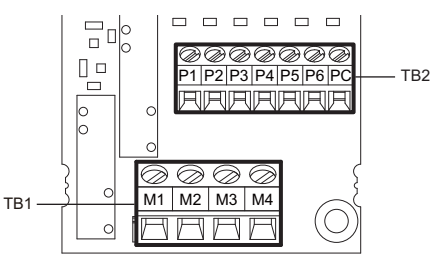


A – Connector (CN5)
B – Installation hole
C – Terminal block TB2
D – Model number
E – Ground terminal and installation hole *<1>*
F – Terminal block TB1

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

Figure 1 Digital Output DO-A3 Option Components

◆ Terminal Blocks TB1 and TB2



Refer to ***Table 4*** on page ***20*** for details on TB1 and TB2 terminal functions and signal levels.

5 Installation Procedure

◆ Section Safety

⚠ DANGER

Electric 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 unit and wait at least the amount of time specified on the unit 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. The internal capacitor remains charged after the power supply is turned off.

⚠ WARNING

Electrical Shock Hazard

Do not remove the front covers of the unit while the power is on.

Failure to comply could result in death or serious injury.

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

Do not allow unqualified personnel to use equipment.

Failure to comply could result in death or serious injury.

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

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

Failure to comply could result in death or serious injury.

⚠ WARNING

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

Failure to comply could result in death or serious injury.

Fire Hazard

Tighten all terminal screws to the specified tightening torque.

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

NOTICE

Damage to Equipment

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

Failure to comply may result in ESD damage to circuitry.

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

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

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.

Tighten all terminal screws to the specified tightening torque.

Failure to comply could result in damage to the terminal block.

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 unit.

NOTICE

Properly connect all pins and connectors.

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

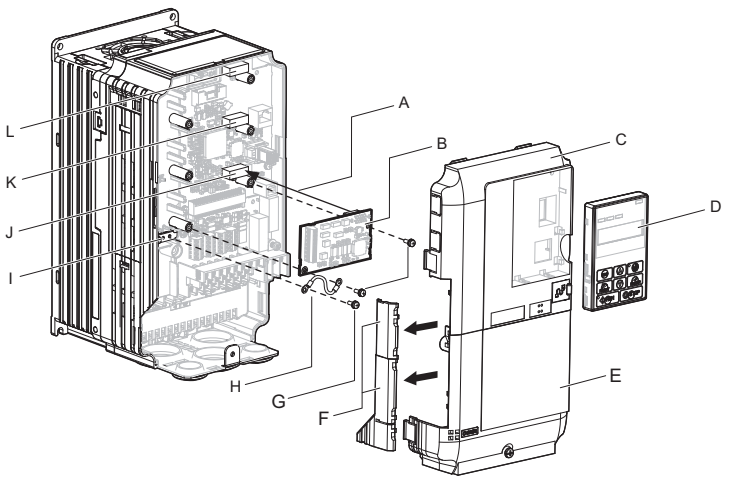
Check wiring to ensure that all connections are correct after installing the option and connecting any other devices.

Failure to comply may result in damage to the option.

◆ Prior to Installing the Option

Prior to installing the option, wire the unit, make the necessary connections to the unit terminals, and verify that the unit functions normally. Refer to the instruction manual packaged with the unit for information on wiring and connecting the unit.

Figure 2 shows an exploded view of the unit with the option and related components for reference.



A – Insertion point for CN5
B – Option card
C – Front cover
D – Digital operator
E – Terminal cover
F – Removable tabs for wire routing
G – Included screws
H – Ground wire
I – Unit grounding terminal (FE)
J – Connector CN5-A
K – Connector CN5-B
L – Connector CN5-C

Figure 2 Unit Components with Option

◆ Installing the Option

Refer to the instructions below to install the option.

1. Shut off power to the unit, wait the appropriate amount of time for voltage to dissipate, then remove the digital operator (D), front cover (C), and terminal cover (E). Cover removal varies depending on unit size. Refer to the instruction manual packaged with the unit for directions on removing the covers.

DANGER! *Electrical Shock Hazard. Disconnect all power to the unit and wait at least the amount of time specified on the unit 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, unit, and circuit boards. Failure to comply may result in ESD damage to circuitry.*

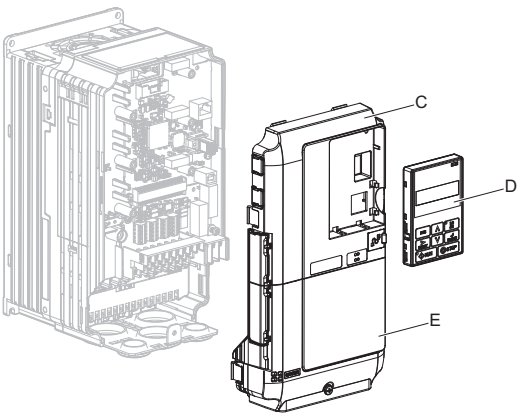


Figure 3 Remove the Front Cover, Terminal Cover, and Digital Operator

2. Insert the option card (B) into the CN5-A (J), CN5-B (K), or CN5-C (L) connector located on the unit and fasten it into place using one of the included screws (G).

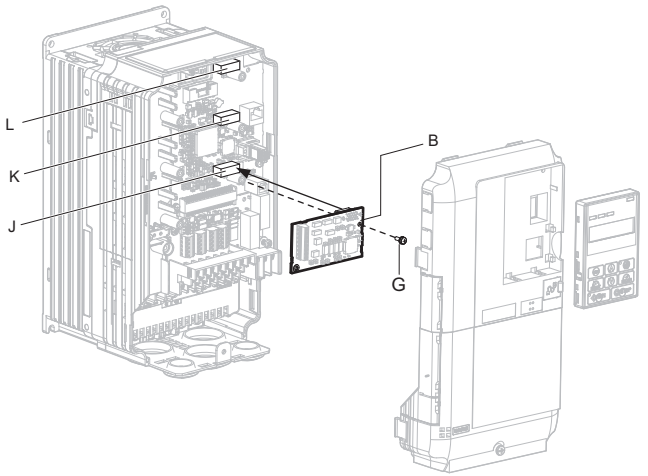


Figure 4 Insert the Option Card

3. Connect one end of the ground wire (H) to the ground terminal (I) using one of the remaining screws (G). Connect the other end of the ground wire (H) to the remaining ground terminal and installation hole on the option (B) using the last remaining provided screw (G).

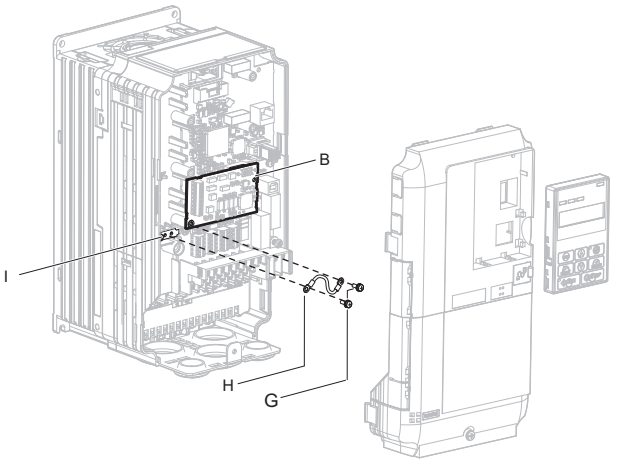


Figure 5 Connect the Ground Wire

Note: **1.** The option package includes three ground wires. Use the longest wire when plugging the option into connector CN5-C on the unit side. Use the next longest wire when plugging the option into connector CN5-B. Use the shortest wire when plugging the option into connector CN5-A. Refer to ***Option Package Contents on page 8*** for more information.

2. There are two screw holes on the unit for use as ground terminals (J). When connecting three options, two ground wires will need to share the same unit ground terminal.

4. Prepare and connect the wire ends as shown in ***Figure 6*** and ***Figure 7***. Refer to ***Wire Gauges and Tightening Torques on page 19*** to confirm that the proper tightening torque is applied to each terminal. Take particular precaution to ensure that each wire is properly connected and wire insulation is not accidentally pinched into electrical terminals.

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

NOTICE: *Heat shrink tubing or electrical tape may be required to ensure that cable shielding does not contact other wiring. Insufficient insulation may cause a short circuit and damage the option or unit.*

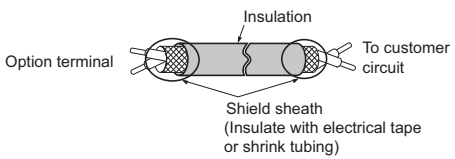


Figure 6 Preparing Ends of Shielded Cable

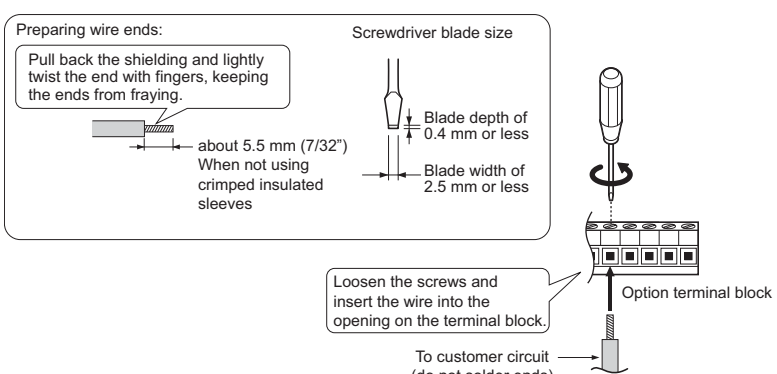
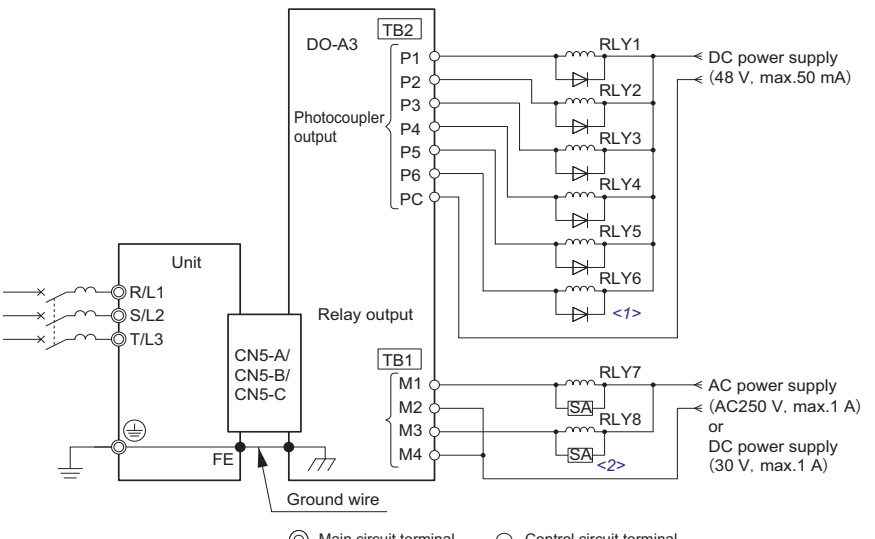


Figure 7 Preparing and Connecting Cable Wiring

5. Wire the customer-supplied circuit to the terminal blocks on the option. Refer to ***Figure 8*** for wiring instructions.

Connection Diagram
Refer to ***Table 4*** on page ***20*** for a detailed description of the option board terminal functions. To ensure accurate control, use stable power supply for the voltage reference source.



<1> Double-check the polarity on the diode when connecting a DC relay.
<2> Install a surge absorber (SA) when using an AC relay.

Figure 8 Option Connection Diagram

Wire Gauges and Tightening Torques

Wire gauge and torque specifications are listed in ***Table 2***.

Table 2 Wire Gauges and Tightening Torques

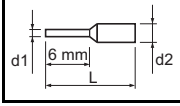
Terminal signal	Screw Size	Tightening Torque N·m (in·lb)	Bare Cable		Ferrule-Type Terminals		Wire Type
			Recomm. Gauge mm^2	Applicable Gauges mm^2	Recomm. Gauge mm^2	Applicable Gauges mm^2	
P1 to P6, PC	M2	0.22 to 0.25 (1.95 to 2.21)	0.75 (18 AWG)	Stranded wire: 0.25 to 1.0 (24 to 17 AWG) Solid wire: 0.25 to 1.5 (24 to 16 AWG)	0.5 (20 AWG)	0.25 to 0.5 (24 to 20 AWG)	Shielded twisted pair, etc.
M1 to M4	M3	0.5 to 0.6 (4.43 to 5.31)		Stranded wire: 0.25 to 1.5 (24 to 16 AWG) Solid wire: 0.25 to 2.5 (24 to 13 AWG)		0.25 to 1.0 (24 to 17 AWG)	

Ferrule-Type Terminals

Yaskawa recommends using CRIMPFOX 6 by Phoenix Contact or equivalent ferrule-type terminals with the specifications listed in ***Table 4*** for wiring to ensure proper connections.

Note: Properly trim wire ends so loose wire ends do not extend from the crimp terminals.

Table 3 Ferrule-Type Terminal Sizes

Ferrule-Type Terminal	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)

Terminal Functions

Table 4 Option Terminal Functions

Terminal Block	Terminal	Output <1>	Output Type	Output Level
TB1	M1	Contact relay output 1	N.O. output	Max voltage and current: 250 Vac, 1 A 30 Vdc, 1 A
	M2			
	M3	Contact relay output 2		
	M4			
TB2	P1	Photocoupler output 1	Open-collector output	Max voltage and current: 48 Vdc, 50 mA
	P2	Photocoupler output 2		
	P3	Photocoupler output 3		
	P4	Photocoupler output 4		
	P5	Photocoupler output 5		
	P6	Photocoupler output 6		
	PC	Photocoupler output common	Emitter common	

<1> Set unit parameters to determine the function assigned to each output. See the unit Instruction Manual for directions on setting parameters.

6. Route the option wiring.
Depending on the unit model, some units may require routing the wiring through the side of the front cover to the outside. In these cases, cut out the perforated openings on the left side of the unit front cover as shown in ***Figure 9-A*** and leave no sharp edges to damage wiring.
Route the wiring inside the enclosure as shown in ***Figure 9-B*** for units that do not require routing through the front cover.
Refer to the Peripheral Devices & Options section of the unit Instruction Manual for more information.

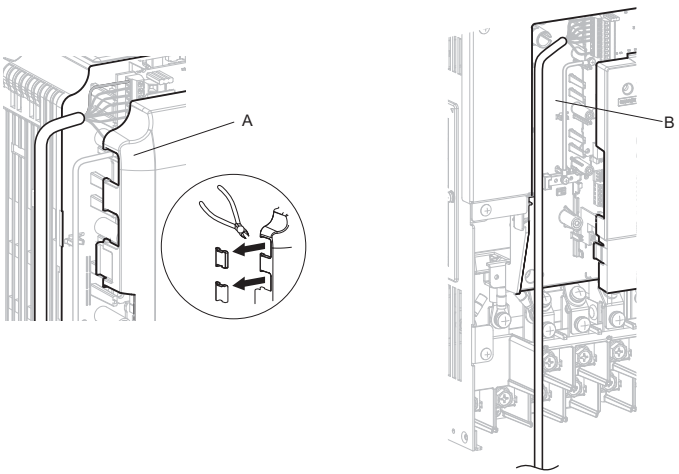


Figure 9 Wire Routing Examples

7. Replace and secure the front covers of the unit (C, E) and replace the digital operator (D).

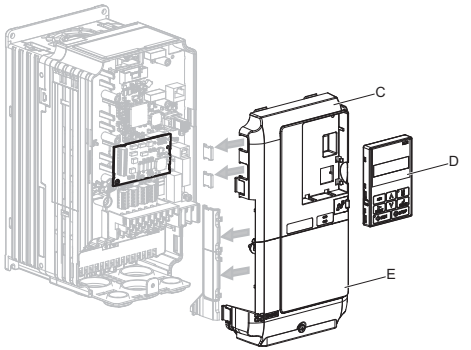


Figure 10 Replace the Front Covers and Digital Operator

Note: Take proper precautions when wiring the option so that the front covers will easily fit back onto the unit. Make sure cables are not pinched between the front covers and the unit when replacing the covers.

8. Set unit parameters in ***Table 7*** for proper option performance.

6 Related Parameters

The parameters outlined in the following sections are used to set up the unit for operation with the option. Set parameters as needed. Parameter setting methods can be found in the drive unit Instruction Manual.

◆ Parameter F5-09

Set parameter F5-09 to select the option output mode.

Table 5 shows the changes in the output terminal contents according to the output mode set in F5-09.

Table 5 F5-09 and Output Mode

Terminal Block	Terminal	F5-09 = 0 Individual Output (Default when Installed to Drive)	F5-09 = 1 Binary Code Output	F5-09 = 2 Multi-Function Output (Default when Installed to Energy-Saving Unit)
TB1	M1-M2	Zero speed	During run	Determined by F5-07
	M3-M4	Speed agree	Alarm (excluding bb)	Determined by F5-08
TB2	P1-PC	oC, GF (Overcurrent)	Binary code output (Refer to *Table 6*.)	Determined by F5-01
	P2-PC	ov (Overvoltage)		Determined by F5-02
	P3-PC	oH2 (Unit overheat) or oL2 (overload)		Determined by F5-03
	P4-PC	Not used		Determined by F5-04
	P5-PC	oS (Overspeed)	Zero speed	Determined by F5-05
	P6-PC	oH, oH1 (Unit overheat) or oL1 (Overload)	Speed agree	Determined by F5-06

Table 6 Binary Coded Output (F5-09 = 1)

Coded Output	Description	TB2			
		P1-PC	P2-PC	P3-PC	P4-PC
0	Normal operation (no fault)	0	0	0	0
1	oC, GF (Overcurrent)	1	0	0	0
2	ov (Overvoltage)	0	1	0	0
3	oL2 (Unit overload)	1	1	0	0
4	oH, oH1 (Unit overheat)	0	0	1	0
5	oS (Overspeed)	1	0	1	0
6	Not used	0	1	1	0
7	rr, rH (Braking resistor overheat)	1	1	1	0
8	EF1 to EF12 (External fault)	0	0	0	1
9	CPF□□, oFA□□, oFb□□, oFC□□ (Unit hardware fault)	1	0	0	1
A	oL1 (Motor overload)	0	1	0	1
B	Not used	1	1	0	1
C	Uv1, Uv2, Uv3 (Undervoltage)	0	0	1	1
D	dEv (Speed deviation)	1	0	1	1
E	PGo (PG disconnect)	0	1	1	1
F	Not used	1	1	1	1

◆ Parameter Table

Table 7 Related Parameters

No. (Addr. Hex)	Name	Description	Values
F5-01 (399)	Terminal P1-PC Output Selection	Sets the function for contact output terminals M1-M2, M3-M4, and photocoupler output terminals P1 through P6. <I>	When installed to drive Default: 0 Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160
F5-02 (39A)	Terminal P2-PC Output Selection		When installed to drive Default: 1 Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160
F5-03 (39B)	Terminal P3-PC Output Selection		When installed to drive Default: 2 Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160
F5-04 (39C)	Terminal P4-PC Output Selection		When installed to drive Default: 4 Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160

No. (Addr. Hex)	Name	Description	Values
F5-05 (39D)	Terminal P5-PC Output Selection	Sets the function for contact output terminals M1-M2, M3-M4, and photocoupler output terminals P1 through P6. <1>	When installed to drive Default: 6 Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160
F5-06 (39E)	Terminal P6-PC Output Selection		When installed to drive Default: 37 Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160
F5-07 (39F)	Terminal M1-M2 Output Selection		When installed to drive Default: F Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160
F5-08 (3A0)	Terminal M3-M4 Output Selection		When installed to drive Default: F Range: 0 to 1A7 When installed to energy-saving unit Default: F Range: 0 to 160
F5-09 (3A1)	DO-A3 Output Mode Selection	0: Output terminals are each assigned separate output functions. 1: Binary code output 2: Multi-function output (set functions in parameters F5-01 through F5-08)	When installed to drive Default: 0 Range: 0 to 2 When installed to energy-saving unit Default: 2 Range: 2

<1> Refer to the unit Instruction Manual for more information on setting the F5 parameters.

7 Troubleshooting

◆ Unit-Side Error Codes

Table 8 lists the various fault codes related to the option. Refer to the unit instruction manual for further details on fault codes.

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

- Are the cables connected properly and securely?
- Is the option is properly installed to the unit?
- Did a momentary power loss occur?

Table 8 Fault Displays, Causes, and Possible Solutions

Digital Operator Display		Fault Name
oFA01	oFA01	Option Fault (CN5-A) Option is not properly connected.
Cause		**Possible Solution**
Option at unit port CN5-A was changed during run.		Turn the power off and check the connectors between the unit and option.
Digital Operator Display		**Fault Name**
oFb01	oFb01	Option Fault (CN5-B) Option is not properly connected.
Cause		**Possible Solution**
Option at unit port CN5-B was changed during run.		Turn the power off and check the connectors between the unit and option.
Digital Operator Display		**Fault Name**
oFb02	oFb02	Option Fault (CN5-B) Two of the same options are connected simultaneously.
Cause		**Possible Solution**
Same type of option connected to ports CN5-A and CN5-B.		Use only compatible options.
Digital Operator Display		**Fault Name**
oFC01	oFC01	Option connection error at unit port CN5-C
Cause		**Possible Solution**
Option at unit port CN5-C was changed during run.		Turn the power off and check the connectors between the unit and option.

Digital Operator Display		Fault Name
oFC02	oFC02	Option Fault (CN5-C)
		Two of the same options are connected simultaneously.
Cause		**Possible Solution**
Same type of option connected to unit ports CN5-A, CN5-B, and CN5-C.		Use only compatible options.

◆ Preventing Electrical Signal Interference

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

- Use shielded wire for the signal lines.
- Limit the length of wiring under 50 m (164 ft.).
- Separate the control wiring to the option, main circuit wiring, and power lines.

■ Interface Circuit

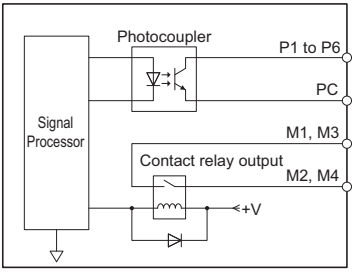


Figure 11 Output Interface Circuit

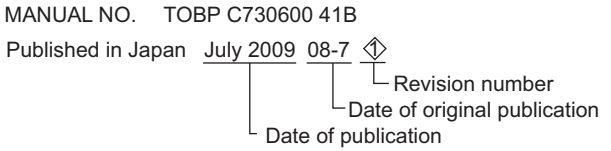
8 Specifications

Table 9 Option Specifications

Item	Description
Model	DO-A3
Photocoupler Output	6 outputs (common emitter) Maximum allowable voltage/current: 48 Vdc/50 mA
Contact Relay Output	2 outputs (independent) Maximum allowable voltage/current: 250 Vac/max.1 A, 30 Vdc/max.1 A
Ambient Temperature	-10°C to +50°C (14°F to 122°F)
Humidity	95% RH or lower with no condensation
Storage Temperature	-20°C to +60°C (-4°F to +140°F) allowed for short-term transport of the product
Area of use	Indoor (free of corrosive gas, airborne particles, etc.)
Altitude	1000 m (3280 ft.) or lower

◆ Revision History

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



Date of Publication	Revision Number	Section	Revised Content
October 2013	◇7	All	Addition: Information on R1000
		Back cover	Revision: Address
August 2012	◇6	All	Addition: Information on D1000
		Back cover	Revision: Address
February 2011	◇5	Chapters 3, 4, 5, and 7	Edited for clarity.
January 2011	◇4	Front cover, back cover	Revision: Format
July 2010	◇3	Back cover	Revision: Address
July 2010	◇2	Entire document	Edited for procedural clarity and readability.
		Back cover	Revision: Address
July 2009	◇1	Chapter 6	Correction: Table 5 F5-09 and Output Mode
July 2008	–	–	First edition

YASKAWA 1000-Series Option

Digital Output
Installation Manual

DRIVE CENTER (INVERTER PLANT)
2-13-1, Nishimiyaichi, Yukuhashi, Fukuoka, 824-8511, Japan
Phone: 81-930-25-3844 Fax: 81-930-25-4369
http://www.yaskawa.co.jp

YASKAWA ELECTRIC CORPORATION
New Pier Takeshiba South Tower, 1-16-1, Kaigan, Minatoku, Tokyo, 105-6891, Japan
Phone: 81-3-5402-4502 Fax: 81-3-5402-4580
http://www.yaskawa.co.jp

YASKAWA AMERICA, INC.
2121 Norman Drive South, Waukegan, IL 60085, U.S.A.
Phone: 1-800-YASKAWA (927-5292) or 1-847-887-7000 Fax: 1-847-887-7310
http://www.yaskawa.com

YASKAWA ELÉTRICO DO BRASIL LTDA.
Avenida Piraporinha 777, Diadema, São Paulo, 09950-000, Brasil
Phone: 55-11-3585-1100 Fax: 55-11-3585-1187
http://www.yaskawa.com.br

YASKAWA EUROPE GmbH
Hauptstrasse 185, 65760 Eschborn, Germany
Phone: 49-6196-569-300 Fax: 49-6196-569-398
http://www.yaskawa.eu.com

YASKAWA ELECTRIC KOREA CORPORATION
9F, Kyobo Securities Bldg., 26-4, Yeouido-dong, Yeongdeungpo-gu, Seoul, 150-737, Korea
Phone: 82-2-784-7844 Fax: 82-2-784-8495
http://www.yaskawa.co.kr

YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.
151 Lorong Chuan, #04-02A, New Tech Park, 556741, Singapore
Phone: 65-6282-3003 Fax: 65-6289-3003
http://www.yaskawa.com.sg

YASKAWA ELECTRIC (CHINA) CO., LTD.
12F, Carlton Bld., No.21 HuangHe Road, HuangPu District, Shanghai 200003, China
Phone: 86-21-5385-2200 Fax: 86-21-5385-3299
http://www.yaskawa.com.cn

YASKAWA ELECTRIC (CHINA) CO., LTD. BEIJING OFFICE
Room 1011, Tower W3 Oriental Plaza, No. 1 East Chang An Ave.,
Dong Cheng District, Beijing, 100738, China
Phone: 86-10-8518-4086 Fax: 86-10-8518-4082

YASKAWA ELECTRIC TAIWAN CORPORATION
9F, 16, Nanking E. Rd., Sec. 3, Taipei, 104, Taiwan
Phone: 886-2-2502-5003 Fax: 886-2-2505-1280

YASKAWA INDIA PRIVATE LIMITED
#17/A Electronics City, Hosur Road Bangalore 560 100 (Karnataka), India
Phone: 91-80-4244-1900 Fax: 91-80-4244-1901
http://www.yaskawaindia.in

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.

© 2008-2013 YASKAWA ELECTRIC CORPORATION. All rights reserved.

MANUAL NO. TOBP C730600 41F

Published in Japan October 2013 08-7 ⟨7⟩-0
13-7-11