

VARISPEED-616G5 OPTION CARD  
2C-RELAY OUTPUT CARD DO-02C  
**INSTRUCTIONS**

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Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

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## NOTES FOR SAFE OPERATION


Read this instruction manual thoroughly before installation, operation, maintenance or inspection. In this manual, the NOTES FOR SAFE OPERATION is classified as “CAUTION”.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to personnel and damage to equipment.

It may also be used to alert against unsafe practices.

Even items described in  may result in a vital accident in some situations. In either case, follow these important items.

 : These are steps to be taken to insure proper operation and to avoid malfunctions, etc.

### CAUTION

- The option card uses C MOS IC chips. It may break if touched by bare fingers because of static electricity. Be careful when handling.
- When removing the option card from the inverter for transportation or storage, put the card into the anti-static package it was in when delivered.
- Never change wiring or connect or disconnect connectors while the power is ON.

Failure to observe this caution may injure you.

The 2C-relay output card, DO-02C is mounted on the control board of the inverter to output two 1C dry contacts.

This option card is applicable to the following inverter series:  
VS-616G5: Entire series

Name	Code No.	Functions
2C-relay output card DO-02C	73600-A007X	C (1A-1B) dry contact output × 2 circuits Contact open/close capability: 250VAC 1A or lower 30VDC 1A or lower

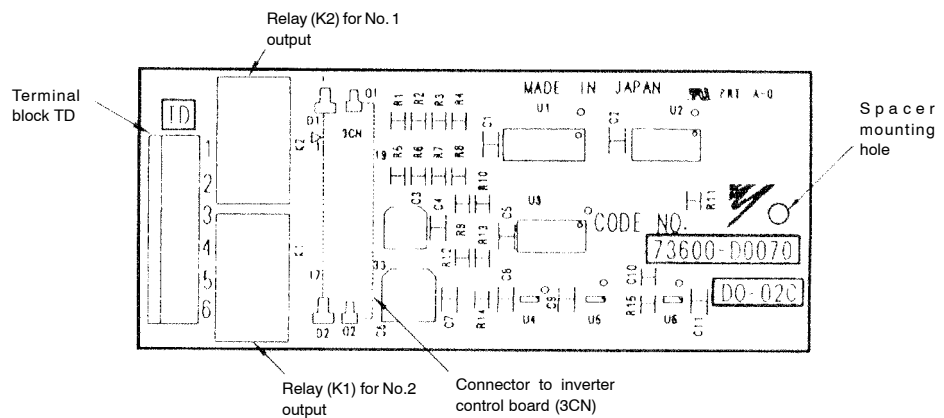


Fig. 1 2C-relay output card DO-02C



Before use,

- (1) Before using DO-02C, read this manual and the manual for the installation of the inverter.
- (2) Before connecting DO-02C or external terminals, turn OFF main power of the inverter and verify the CHARGE indicator lamp of the inverter is OFF.
- (3) When ordering DO-02C, specify the name and code number.

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# 1 Inspection after Delivery



## CAUTION

- Verify that ordered products have been delivered.  
Installation of a wrong device may lead to injury or damage.

Though the products have undergone rigorous inspection before shipping, check the following for safety.

- Check the name written on the product to verify that ordered products have been delivered.
- Check for damage caused during transportation.

If there is anything uncertain on the structure, contact your YASKAWA representative.

## 2 Installing to Inverter (See Fig. 2)

### 2.1 Installation Procedure

- ① Turn OFF the main power and wait for the time specified on the cover of the inverter. Remove the cover and verify that the CHARGE indicator lamp is OFF.
- ② Plug the 3CN connector of 2C-relay output card DO-02C into the 3CN connector (34 pins) on the control board of the inverter. Gently push DO-02C until the spacer engages the spacer hole of the option card on the control board. Fix DO-02C tightly. (See part A of the side view.)
- ③ After installing DO-02C, connect the inverter with peripheral devices and replace the cover of the inverter.

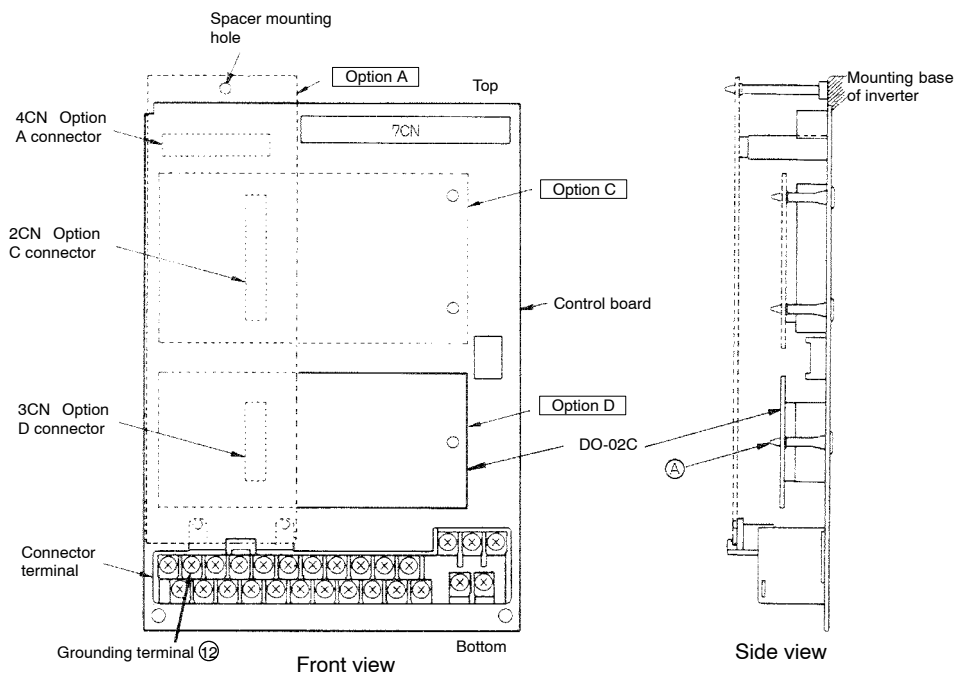


Fig. 2 Installation of 2C-relay output card DO-02C

### 3 Interconnection

Fig. 3 shows interconnection between the inverter, DO-02C, and peripheral equipment.

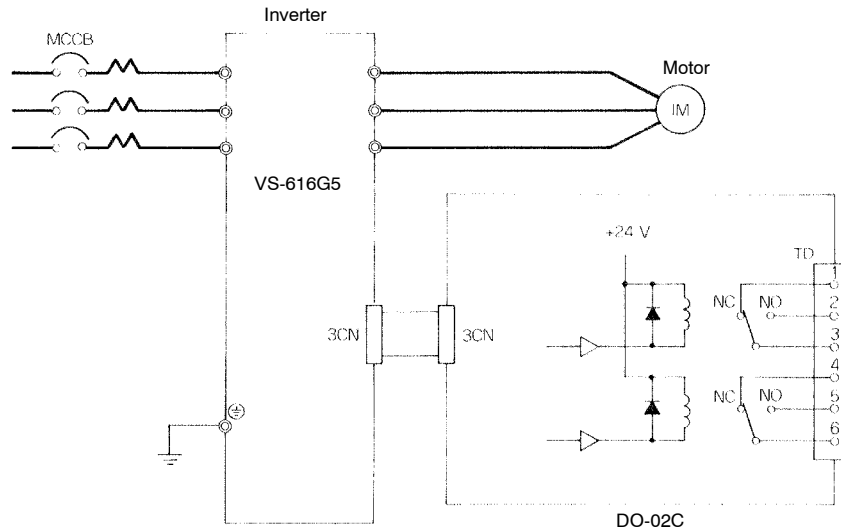


Fig. 3 Interconnection diagram



Care must be taken with the cables connected to DO-02C according to the use of the card. Observe the following.

- If the card is to be used as a heavy current circuit (for main circuit wiring, or as any other type of circuit that emits much noise), separate the cables from other signal cables.
- If the card is to be used as a signal circuit, separate the cables from heavy current circuits (main circuit wiring or any other power wiring).

The output relays of DO-02C are not for weak current signals. If used for switching of weak current signals, imperfect contact may occur.

## 4 Wiring

See Table 1 for the functions of the external terminals.

Table 1 External terminals

Terminal block symbol	Pin No.	Functions
TD	1	No. 1 output, Normal close (NC) contact
	2	No. 1 output, Normal open (NO) contact
	3	No. 1 output, Common terminal
	4	No. 2 output, Normal close (NC) contact
	5	No. 2 output, Normal open (NO) contact
	6	No. 2 output, Common terminal

Make sure the followings when wiring.

- Applicable wire sizes for terminal block TD are shown below.

[Terminal: MKDS1 series manufactured by Phoenix Contact GmbH & Co.]

	[mm <sup>2</sup> ]	AWG	I [A]	VAC [V]
Thin twisted wire	1	16	16	250
Solid wire	1.5	14	16	250
UL	—	22–14	10	300
CSA	—	22–14	10	300



Terminal block TD side  
Connecting wire end

### NOTE

#### Notes on selecting cables

Too thick a cable applies pressure to the option card and may lead to failure.

Too thin a cable may lead to imperfect contact or a break in the wire.

For setting and selecting constants, refer to the constants list in ‘descriptive manual for constants’ (Manual No. TOEZ-S616-10.11).

## 5 Related constants for 2C-Relay Output Card DO-02C

Table 2 Related constants for 2C-Relay Output Card DO-02C

Operator function display	Operator display	Constant No.	Name	Setting range	Factory setting	Change during operation	Reference
DO-02	DO-02 Ch1 Select	F5-01	Channel 1 output selection	0 to FF	0	Disabled	<ul style="list-style-type: none"> <li>Refer to Table 3 for the output function.</li> <li>Refer to the function selection of the multi-function output terminal of the inverter for details of each function.</li> </ul>
	DO-02 Ch2 Select	F5-02	Channel 2 output selection	0 to FF	1	Disabled	

Table 3 Multi-function Output Functions of DC-02C

Setting value	Function	Setting value	Function
00	During run (ON: run command is input or during inverter output)	20	–
01	Zero speed	21	–
02	Frequency agree 1	22	–
03	Desired frequency agree 1	23	–
04	Frequency detection 1	24	–
05	Frequency detection 2	25	–
06	Inverter Operation ready	26	–
07	During undervoltage (UV) detection	27	–
08	During baseblock (NO contact output)	28	–
09	Frequency reference mode	29	–
0A	Run command mode	2A	–
0B	Overtorque detection 1 (NO contact output)	2B	–
0C	Loss of frequency reference	2C	–
0D	Braking resistor fault	2D	–
0E	Fault (Faults other than CPF00 or CPF01)	2E	–
0F	–	2F	–
10	Alarm	30	During torque limit *2
11	Fault reset command active	31	During speed limit *1
12	Timer function output	32	–
13	Frequency agree 2	33	During zero-servo *1
14	Desired frequency agree 2	34	–
15	Frequency detection 3	35	–
16	Frequency detection 4	36	–
17	Overtorque detection 1 (NC contact output)	37	During run 2 (Other than Base block, DC injection braking, initial excitation)
18	Overtorque detection 2 (NO contact output)	38	–
19	Overtorque detection 2 (NC contact output)	39	–
1A	During reverse run	3A	–
1B	During baseblock (NC contact output)	3B	–
1C	–	3C	–
1D	Regenerating/motoring mode (Closed during regenerating mode) *1	3D	–
1E	Restart enabled	3E	–
1F	Motor overload (OL1) pre-alarm	3F	–

\* 1. Can be used during Flux vector control mode.

\* 2. Can be used during Open loop vector or Flux vector control mode.



Table 4 Constants List

Digital Operator Function Display	Digital Operator Display	Constant No.	Constant Name	Setting Range	Factory Setting	Change during Operation (○=Enable, X=Disable)	Data Selection	Control Method (○=Setting enable, X=Setting disable)			
								V/f Control	V/f with PG Feedback	Open Loop Vector	Flux Vector
Sequence	Reference Source	B1-01	Reference selection	0 to 3	1	X	0 : Digital operator 1 : Terminal 2 : Serial communication 3 : Option PCB	○	○	○	○
	Run Source	B1-02	Operation method selection	0 to 3	1	X	0 : Digital operator 1 : Terminal 2 : Serial communication 3 : Option PCB	○	○	○	○
	Stopping method	B1-03	Stopping method selection	0 to 3	0	X	0 : Ramp to Stop 1 : Coast to Stop 2 : DC injection to stop 3 : Coast with timer	○	○	○	○
	Reverse Oper	B1-04	Prohibition of reverse operation	0, 1	0	X	0 : Reverse enabled 1 : Reverse disabled	○	○	○	○
AI-14B	AI-14 Input Set	F2-01	Bi-polar or uni-polar input selection	0/1	0	X	0 : 0 to 10V 1 : -10 to 10 V	X	○	○	○
DI-08, DI-16H2	DI Input	F3-01	Digital input option	0 to 8	1	X	0 : BCD 1% 1 : BCD 0.1% 2 : BCD 0.01% 3 : BCD 1 Hz 4 : BCD 0.1Hz 5 : BCD 0.01Hz 6 : BCD (5 digits) input 7 : Binary 100%=255 4095/10000	X	○	X	○
AO-08, -12	AO Ch1 Select	F4-01	Channel 1 monitor selection	1 to 31	2	X	0 : Disabled 1 : Enabled	X	○	X	X
	AO Ch1 Gain	F4-02	Channel 1 gain	0 to 2.50	1.00	○		X	○	X	○
	AO Ch2 Select	F4-03	Channel 2 monitor selection	1 to 31	3	X		X	○	X	○
	AO Ch2 Gain	F4-04	Channel 2 gain	0 to 2.50	1.00	○		X	○	X	○
DO-02C	DO-02 Ch1 Select	F5-01	Channel 1 output selection	0 to FF	0	X		X	○	X	○
	DO-02 Ch2 Select	F5-02	Channel 2 output selection	0 to FF	1	X		X	○	X	X
DO-08	DO-08 Selection	F6-01	Output mode selection	0 to 2	0	X	0 : 8-channel individual 1 : Binary output	X	○	X	X
DO-36F	PO-36F Selection	F7-01	Frequency multiple selection	0 to 4	0	X	0 : 1F 1 : 6F 2 : 10F 3 : 12F 4 : 36F	X	○	X	X