

VARISPEED SERIES OPTION CARD
PROFIBUS-DP COMMUNICATION INTERFACE CARD
INSTRUCTIONS

MODEL: SI-P1

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



Safety Information

Read this instruction manual and the related documents thoroughly before installation, operation, maintenance or inspection of this product. Make sure you understand product information, all precautions and safety information before using the product. Also, keep this manual in a convenient location so that it can be referred to whenever necessary.


The following conventions are used to indicate precautions in this manual.



Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.



Indicates precautions that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

Even items described in  may result in a vital accident in some situations.

In either case, follow these important notes.



: Items to be observed by users are described in the relevant sections.

CAUTION

- **A CMOS IC is used for the Option Card. Handle the control board and CMOS IC carefully. The CMOS IC can be destroyed by static electricity if touched directly.**
- **To remove this option card from the inverter and transport or store it separately, keep the option card in the anti-static electricity package used to protect the unit at delivery.**
- **Do not change the wiring or remove/insert the connectors while the power is turned ON.**

Failure to observe this caution may result in injury.

The PROFIBUS-DP Communication Interface Card SI-P1 is an option card that can be mounted on the inverter control circuit board and used for communications with the PROFIBUS-DP master.

Three types of I/O data length (32 bytes, 12bytes, 6bytes) can be selected. The run/stop status can be monitored and the inverter internal constants can be set/changed from the PROFIBUS-DP master.

The SI-P1 card can be mounted on these inverters.

VS-616G5:Standard series (Operates on inverter software No.S1042 or later edition)

Varispeed F7:Standard series

Varispeed G7:Standard series

Description	Code No.	Function
SI-P1 PROFIBUS-DP Communication Interface Card SI-P1	73600-C033X	<p>PROFIBUS data</p> <p>Extended data 1 (Data length:32 bytes) High-speed I/O data area (input:16bytes, output 16bytes) MEMOBUS message (input:16bytes, output 16bytes)</p> <p>Extended data 2 (Data length:12bytes) High-speed I/O data area (input:4bytes, output 4bytes) MEMOBUS message (input:8bytes, output 8bytes)</p> <p>Basic data (Data length:6 bytes) High-speed I/O data area (input:6bytes, output 6bytes)</p> <p>Communication speed:9.6kbps to 12Mbps</p>



: Before Use

- (1) Read this instruction manual and the instruction manual of the inverter on which the PROFIBUS-DP Communications Interface Card SI-P1 is to be mounted before using the PROFIBUS-DP Communications Interface Card SI-P1
- (2) Connect the PROFIBUS-DP communications interface card SI-P1 to the connectors or external terminals where the inverter power supply is turned OFF and the inverter CHARGE indicator lamp is extinguished.
- (3) Specify the name and code number when placing an order of the PROFIBUS-DP communications interface card SI-P1.

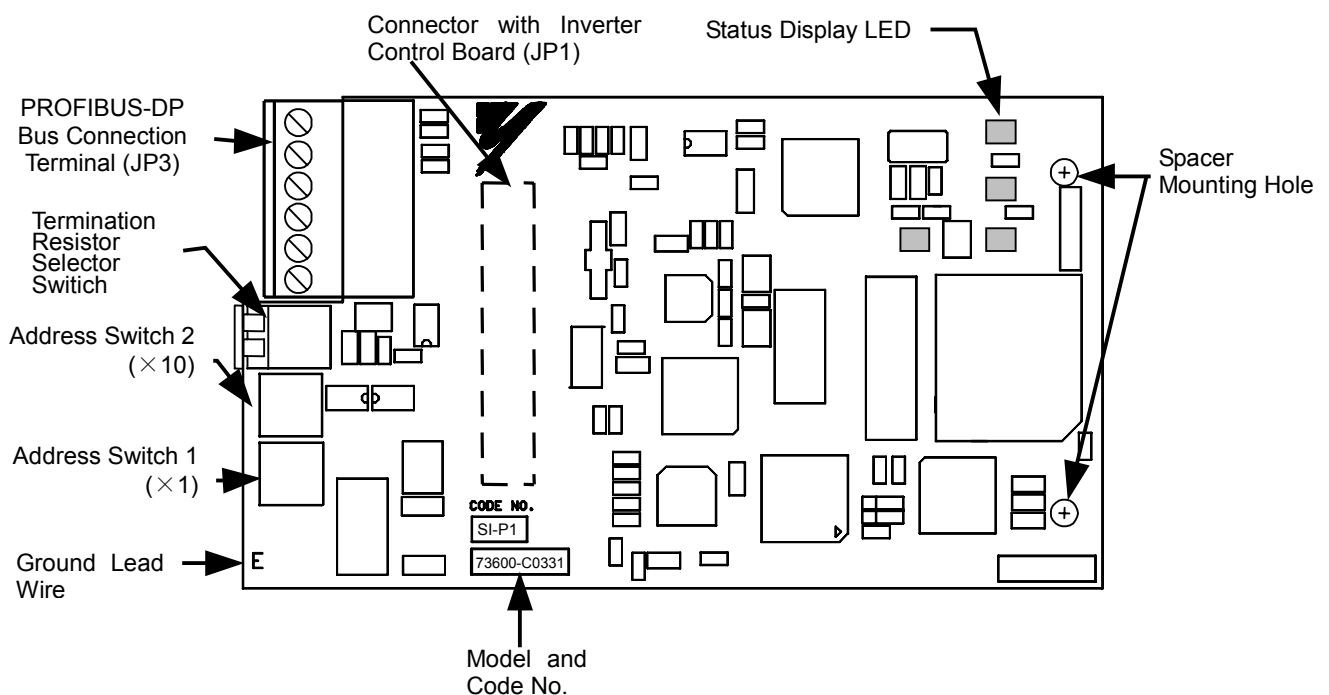


Fig. 1 PROFIBUS-DP Communications Interface Card SI-P1

1. RECEIVING



CAUTION

Verify that the product received is the product ordered.
Installing the wrong product may cause injury or equipment damage.

Check the following points although the product has been through strict inspections.

- (1) Check the nameplate to confirm that the product is as you ordered.
- (2) Check that there is no damaged part caused during transportation.

Contact your Yaskawa representative immediately if any failure should be found concerning the above items.

2. INSTALLING TO INVERTER (See Fig. 2.)

- (1) Turn OFF the main circuit power supply and remove the inverter front cover after passing the time specified in the inverter front cover. Confirm that the CHARGE indicator lamp is extinguished.
- (2) Fit the SI-P1 card connector JP1 to the connector 2CN (number of pins: 60P) on the inverter control board. At this time, insert the two SI-P1 card spacer mounting holes into the option card spacer on the control board until a click is heard, and mount the SI-P1 card firmly. (See part **(A)** in the side view.)
- (3) Connect the ground lead wire to the control circuit terminal E (For G5 inverter : terminal 12) of the inverter control board.
- (4) After mounting the SI-P1 card, select the termination resistor, set the address switches 1 and 2, and make connection with the card to the peripheral devices. After completion of connection, mount the inverter front cover.

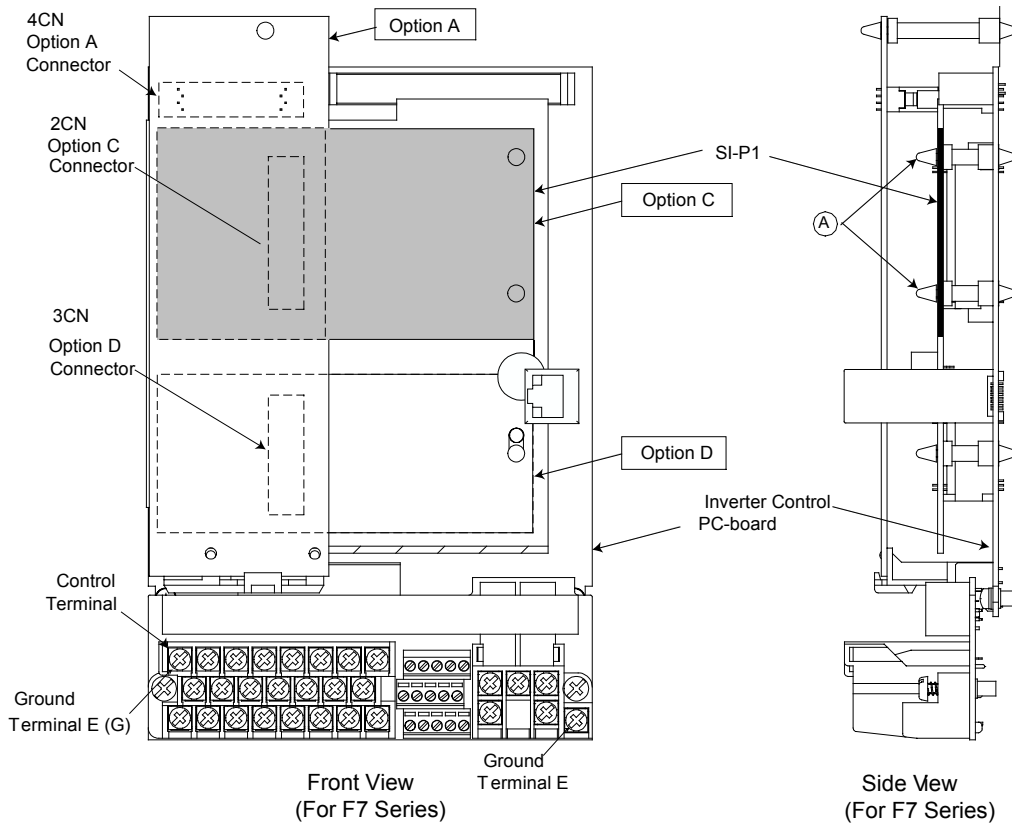
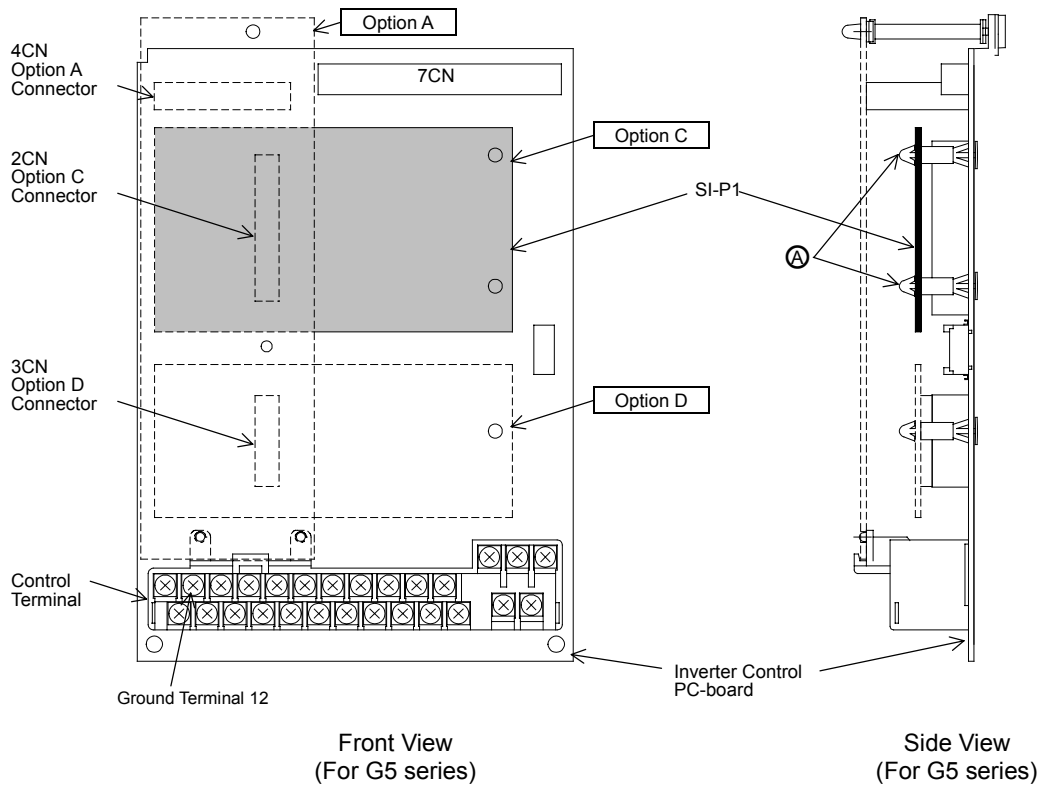


Fig. 2 Installation of PROFIBUS-DP Communications Interface Card SI-P1

3. INTERCONNECTION

Fig. 3 shows the interconnection between the inverter, SI-P1 card and host PROFIBUS-DP master.

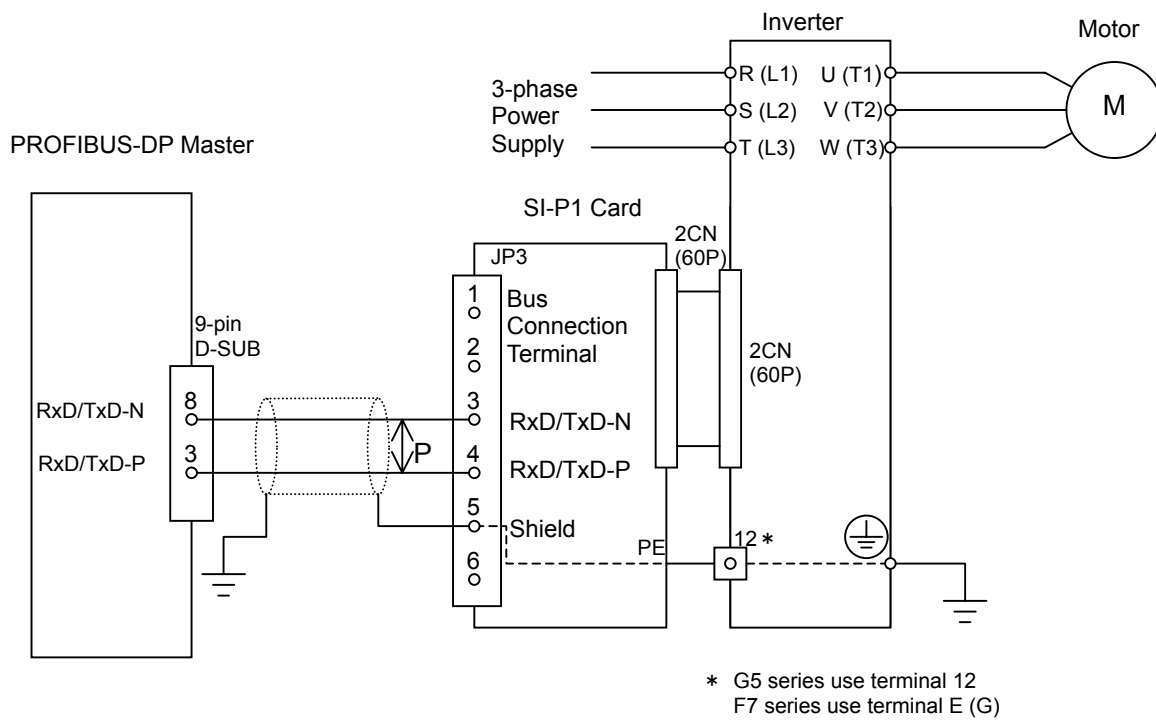


Fig. 3 Interconnection Diagram

: Precaution on Wiring



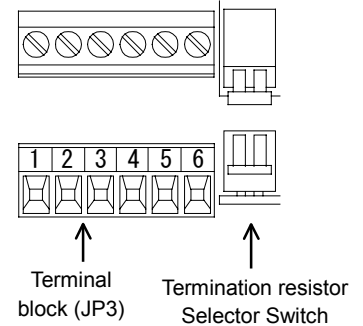
- (1) Separate the SI-P1 card communications wiring from main circuit wiring and other power cables.
- (2) Use a shielded twisted-pair cable conforming to the PROFIBUS specifications for the communications cable.

4. WIRING

(1) Table 1 shows the functions of the terminals for the SI-P1 card PROFIBUS-DP bus connection.

Table 1 Functions of Terminals for SI-P1 Card PROFIBUS-DP Bus Connection

Terminal No.	Name	Contents
1	+5V BUS	Not used.
2	GND BUS	Not used.
3	A-Line	Minus RxD/TxD according to RS-485 specifications
4	B-Line	Plus RxD/TxD according to RS-485 specifications
5	Shield	Bus cable shield connection terminal
6	RTS	Not used.



(2) Wire the host PROFIBUS-DP master and SI-P1 card on the terminal block as follows;

1) The applicable cable sizes of the terminal block JP3 are shown below.

[Terminal: MINI COMBICON series, made by Phoenix Contact Co., Ltd.]

	[mm]	AWG	I [A]	VAC [V]
Twisted Cable	0.14–1.5	28–16	8	160
Single Cable	0.14–1.5	28–16	8	160
UL	—	30–14	8	300
CSA	—	28–16	8	300

2) Refer to Fig. 4 for an illustration of how the end of the connecting cable on the SI-P1 card's side should be prepared.

3) Use a thin screwdriver, less than 2.5mm wide and less than 0.4mm thick, to loosen the terminal screw.

4) Connect the SI-P1 card's terminal block No. 3 with the PROFIBUS-DP master's No. 8 pin and connect the SI-P1 card terminal block No. 4 with the PROFIBUS-DP master's D-SUB No. 3 pin. (See Fig. 3.)

5) Insert the cable from the bottom of the terminal block.

6) Tighten the terminal screw so that the cable cannot be removed.
(Tightening torque: 0.22 to 0.25 [N · m])

7) To connect more than one lead wire to a single terminal on the terminal block, observe the following diagram.

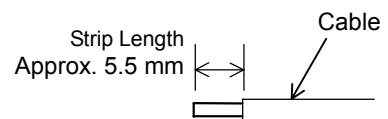
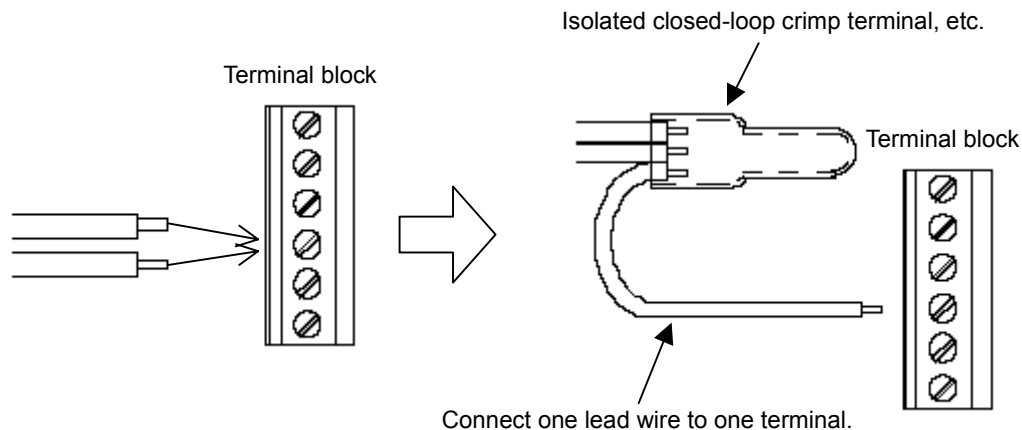
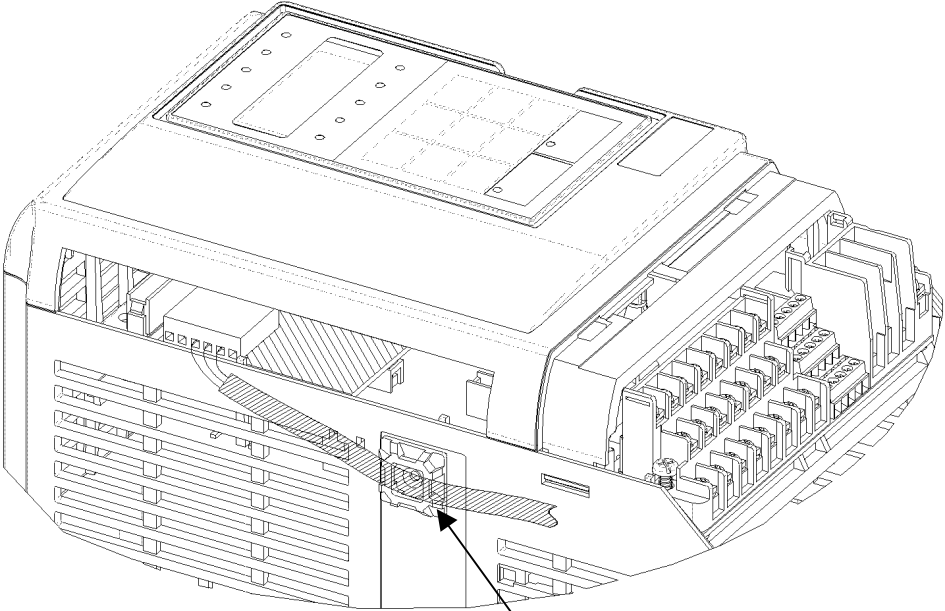


Fig. 4 Connection Cable Termination at Bus Connection Terminal SI-P1



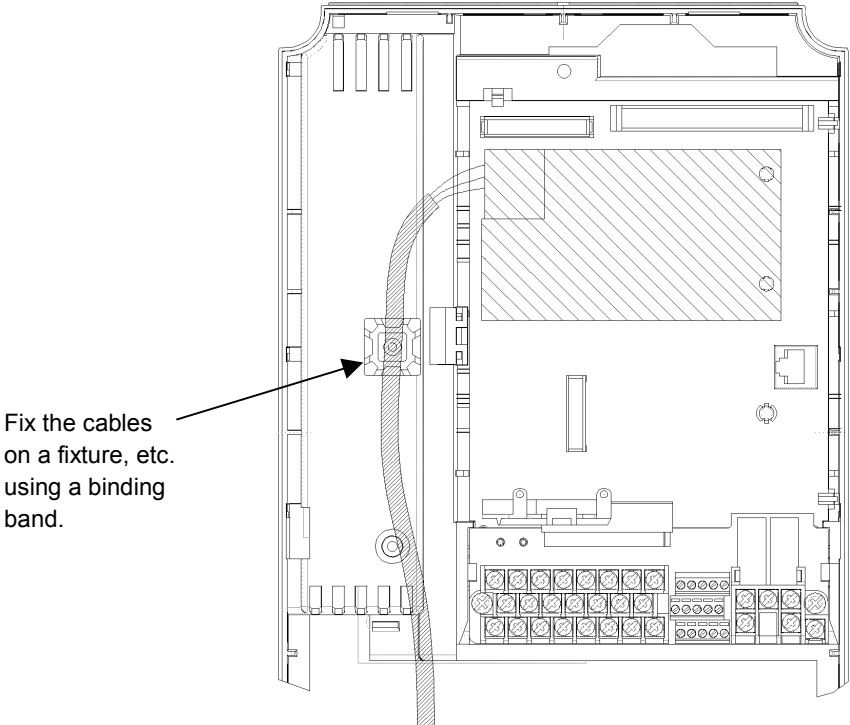
(3) To avoid stress being applied to the connection parts, fix the cables using a binding band and a fixture, etc. as follows:

For F7 Series of 5.5 kW or less, G7 Series of 3.7 kW or less



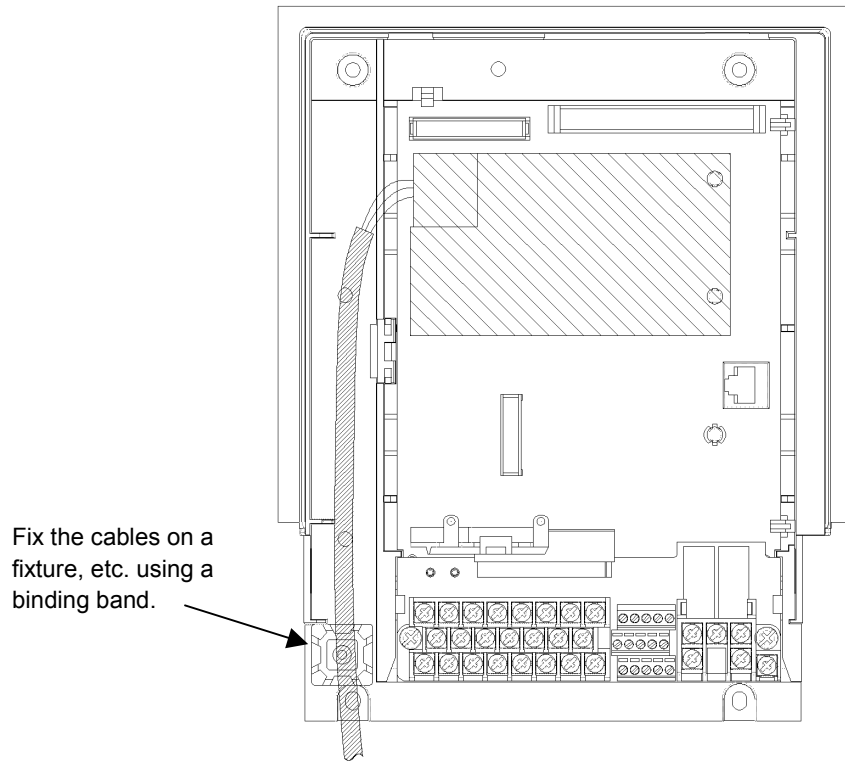
Fix the cables on a fixture, etc. using a binding band.

For F7 Series of 7.5/11/15/18 kW, G7 Series of 5.5/7.5/11/15 kW



Fix the cables on a fixture, etc. using a binding band.

For F7 Series of 22 kW or more, G7 Series of 18.5 kW or more



5. SETTING

5.1 Setting of SI-P1 Board

5.1.1 Address Switches

Rotary address switches to set the slave address on the PROFIBUS-DP are provided.

Setting address switches 1 and 2 on the SI-P1 card can be used to set the inverter address on the PROFIBUS-DP.

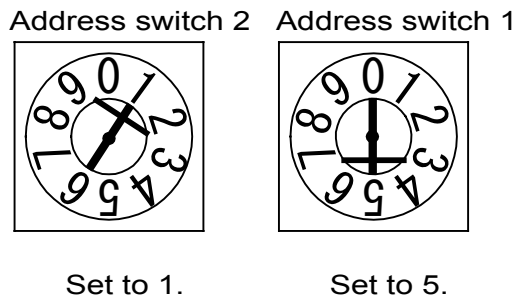
Address setting:

$$\text{Address} = (\text{setting of address switch 2}) \times 10 + (\text{setting of address switch 1}) \times 1$$

Example) For address "15" setting.

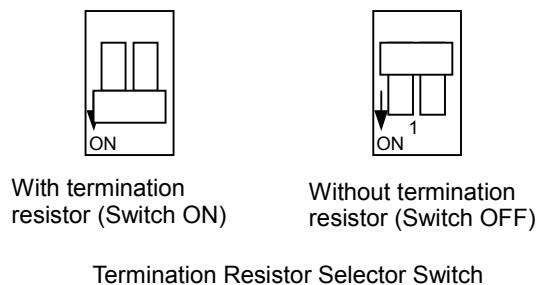
Set address switch 2 to "1".

Set address switch 1 to "5".



5.1.2 Termination resistor Selector Switch

To reduce the reflection of the signal and stabilize communications, a termination resistor must be attached on the end unit of the transmission line. When the SI-P1 card is connected as the end unit of the communications line, the termination resistor selector switch ON of the SI-P1 card will connect the termination resistor. Termination resistors do not have to be mounted externally.



5.1.3 Setting of Communications Speed

When the communications speed is set on the PROFIBUS-DP master, the speed for the SI-P1 card is also automatically set. The communications speed for the SI-P1 card does not have to be set.

5.2 Inverter Setting

Execute the following constant setting, whenever necessary, before starting communications between the inverter and the PROFIBUS-DP master.

5.2.1 F7, G7 Series

Constant No.	Name	Description	Factory setting
b1-01	Reference selection *1	Set the frequency reference input method. 0: Digital Operator 1: Control circuit terminal (analog input) 2: MEMOBUS communications 3: Option Card 4: Pulse train input	1
b1-02	Operation method selection *1	Set the run command input method 0: Digital Operator 1: Control circuit terminal (sequence input) 2: MEMOBUS communications 3: Option Card	1
F6-01	Stopping method after communications errors	Set the stopping method for communications errors. 0: Deceleration stop using deceleration time in C1-02. 1: Coast to stop 2: Emergency stop using deceleration time in C1-09 3: Continue operation *2	1
F6-02	Input level of external error from Communications Option Card	0: Always detect. 1: Detect during operation.	0
F6-03	Stopping method for external error from Communications Option Card	0: Deceleration stop using deceleration time in C1-02 1: Coast to stop 2: Emergency stop using deceleration time in C1-09 3: Continue operation *2	1

*1: To run/stop through the PROFIBUS-DP communications, set "3" to b1-02. To set frequency, set "3" to b1-01.

*2: Selecting "Continuous operation" continues the operation with the inverter single-unit at fault occurrence. Therefore, provide some other measures (emergency stop switch, etc.) to assure safe operation.

5.2.2 G5 Series

Constant No.	Name		Description	Factory Setting
	Operator Display			
b1-01	Reference selection *1		0: Digital Operator 1: Control circuit terminals (analog inputs) 2: MEMOBUS communications (using SI-K2) 3: Option Card 4: MEMOBUS communications (for CP-717)	1
	Reference Source			
b1-02	Operation method selection *1		0: Digital Operator 1: Control circuit terminals (sequence inputs) 2: MEMOBUS communications (using SI-K2) 3: Option Card 4: MEMOBUS communications (for CP-717)	1
	Run Source			
F9-01	External Fault Input Level from Optical option		0:NO contact (external fault at "1") 1:NC contact (external fault at "0")	0
	E-15 Selection			
F9-02	External Fault from Optical Option		0: Always detect 1: Detect during operation	0
	EF0 Detection			
F9-03	Action for external fault from Optical option		0: Deceleration to stop 1: Coast to stop 2: Emergency stop 3: Continue operation *2	1
	EF0 ERROR SELECT			
F9-05	Torque reference/torque limit selection from communications cards other than SI-K2 *3		0: Torque reference/torque limit from communications disabled 1: Torque reference/torque limit from communications enabled *4	1
	Torq/Ref/Lmt Sel			
F9-06	Operation selection when transmission error detected for communications cards other than SI-K2		0: Deceleration to stop (in deceleration time C1-02) 1: Coast to stop 2: Emergency stop (decelerate to stop in emergency stop time C1-09) 3: Continue operation *2	1
	BUS Fault Sel			

*1: To run/stop through the PROFIBUS-DP communications, set "3" to b1-02. To set frequency, set "3" to b1-01.

*2: Selecting "Continuous operation" continues the operation with the inverter single-unit at fault occurrence. Therefore, provide some other measures (emergency stop switch, etc.) to assure safe operation.

*3: Enabled when "3: flux vector control" is selected at A1-02 (control mode selection). In this case, d5-01 (torque control selection) setting alternates torque reference and torque limit.

d5-01 = 0 (speed control mode) : Torque limit value

d5-01 = 1 (torque control mode) : Torque reference value

*4: When "1: Enabled" is selected for F9-05 (factory setting), the motor may not rotate unless torque reference/torque limit is set from the PROFIBUS-DP.

5.3 Operating the GSD File

To configure the SI-P1 card for the PROFIBUS-DP master, the GSD file is necessary. To use the SI-P1 card, register the GSD file in the PROFIBUS-DP master as slave.

The GSD file name (YASK00CA.gsd) for the SI-P1 card is the same as the GSD file name for the SI-P card, however the GSD file version is different.

(Previous GSD file:Revision=Version1.0 → New GSD file:Revision=Version3.1)

Contact your Yaskawa representative to get the new GSD file for SI-P1 card.

The new GSD file (Version3.1) for SI-P1 card is applicable to both the SI-P1 card and the SI-P card.

GSD files

	Version1.0	Version3.1
SI-P card	Applicable	Applicable
SI-P1 card	Not applicable	Applicable

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YASKAWA ELECTRIC CORPORATION

YASKAWA

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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