

A5 Series PLC Installation Manual

Safety precautions

Please read this instruction manual and other related manuals carefully before installing, operating and maintaining the PLC to ensure correct use.

In this manual, safety precautions are divided into two categories: "WARNING" and "DANGER".



Before installing, operating, and maintaining the product, please be sure to read the instruction manual and other relevant manuals carefully to ensure correct use.



Failure to operate according to the instructions in the manual may lead to improper installation, use and storage of the equipment, which may cause personal injury or even death, and cause property damage.

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1 Design precautions

DANGER

When an external power supply abnormality occurs or the programmable logic controller fails, a safety circuit must be installed externally to the programmable logic controller to ensure safe operation of the entire system.

- (1) The external circuit of the programmable logic controller shall be equipped with an emergency stop circuit, protection circuit, interlock circuits for opposing- action operations such as forward/reverse rotation, and interlock circuits for upper/lower position limits to prevent machine damage.
- (2) When the programmable logic controller CPU detects abnormalities such as a WDT error via its self- diagnosis function, all outputs are turned OFF. In the event of an abnormality undetectable by the CPU of the programmable logic controller, outputs cannot be reliably turned OFF. An external protection circuit shall be designed to prevent accidents.
- (3) Transistor failure of the output module may result in outputs being stuck ON or OFF. For critical output signals, external protection circuits and mechanical mechanisms shall be provided to guarantee safe machine operation.

2 Installation precautions

⚠ WARNING

- Use the device within the range specified in the Environmental Specifications manual.
- Do not use the device in locations with dust, oil fumes, conductive dust, corrosive gas or flammable gas; locations exposed to high temperature, condensation, wind and rain; or locations subject to vibration and shock. Electric shock, fire or incorrect operation may also cause damage to the device.
- During screw-hole machining and wiring, prevent iron filings or wire ends from falling into the ventilating openings of the PLC; otherwise, fire, malfunction or incorrect operation may occur.

- To prevent temperature rise, do not install at the bottom, top, and vertical. Be sure to install horizontally on the wall as shown on the right.
- Reserve more than 50 mm clearance between the host and other devices or structures. Try to avoid high-voltage lines, high-voltage equipment and power device.



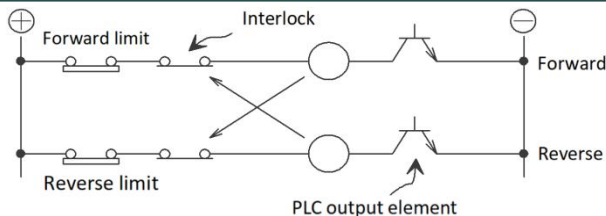
3 Wiring precautions

- Signal input and output lines of the programmable logic controller shall not be run in the same cable.
- Signal input or output lines shall not be routed in the same conduit with other power lines, nor bundled together.
- Input/output wiring of 50 m to 100 m generates nearly no noise if the above precautions are followed. For general safety considerations, wiring length shall be kept within 20 m.

⚠ DANGER

- Installation, wiring and other operations shall only be performed when all external power supplies are disconnected. Failure to do so may result in electric shock or device damage.
- Before energizing the system after completing installation and wiring, the terminal cover must be installed to prevent electric shock.

⚠ DANGER



It is very dangerous to close the forward and reverse contactors at the same time. For loads like this, in addition to the interlock set by the program inside the programmable logic controller, the interlock shown in the above figure must also be set outside the programmable controller.

⚠ WARNING

Do not connect external wiring to vacant terminals marked with "●". Otherwise, device damage may occur.

WARNING

- Do not perform external wiring to vacant terminals marked with "●", otherwise device damage may occur.
- The grounding terminal of the basic unit shall not share ground with high-voltage power systems.
- The programmable controller continues to operate for momentary power outages shorter than 10 ms.
- In case of long time power loss or undervoltage, the PLC stops operation and outputs turn OFF. Operation resumes automatically when power is restored (RUN input is ON).
- The specifications of the terminals shall meet the following requirements:
 - (1) Stripping length 8 to 9 mm.
 - (2) Flexible wire with tubular pre-insulated end 0.2 to 2.0 mm².

4 Startup and maintenance precautions

DANGER

- Please do not touch the terminal when power-on, otherwise it may cause electric shock and misoperation.
- Please remove and clean the terminal after the power is off. Otherwise, it may cause electric shock when power-on.
- Please read the manual carefully and confirm the safety before performing program changes, forced output, RUN, STOP and other operations during machine running.
- Mistakes in operation will damage the machine and cause accidents.

WARNING

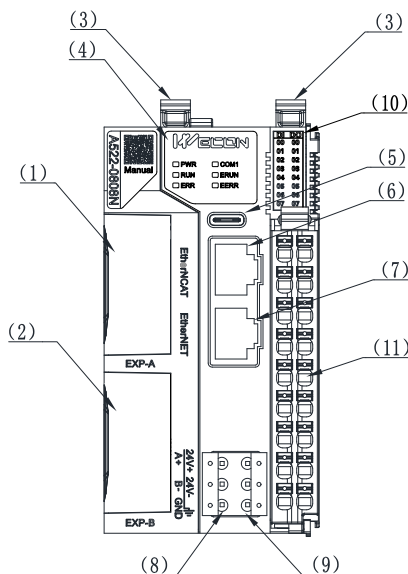
- Do not disassemble or modify the device. Otherwise, failure, malfunction or fire may occur.
- ※ For maintenance matters, please contact FUJIAN FUCAN WECON CO., LTD.
- Connect or disconnect extension cables and other connecting cables only when power is off. Otherwise, failure or malfunction may occur.

5 Maintenance and overhaul

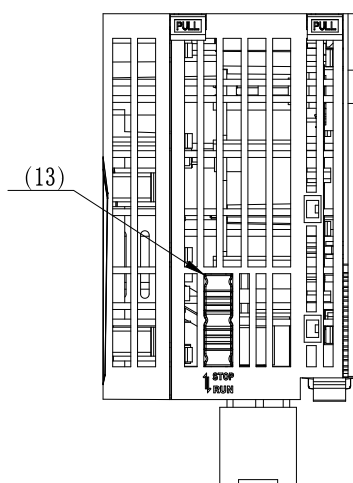
Regular inspection

- Whether the programmable controller contains consumables with short life.
- When checking with other equipment, please note the following points:
 - (1) Whether the temperature inside the machine has risen abnormally due to other heating elements or direct sunlight.
 - (2) Whether there is dust or conductive dust intrusion into the machine.
 - (3) Whether there are loose wiring and terminals and other abnormalities.

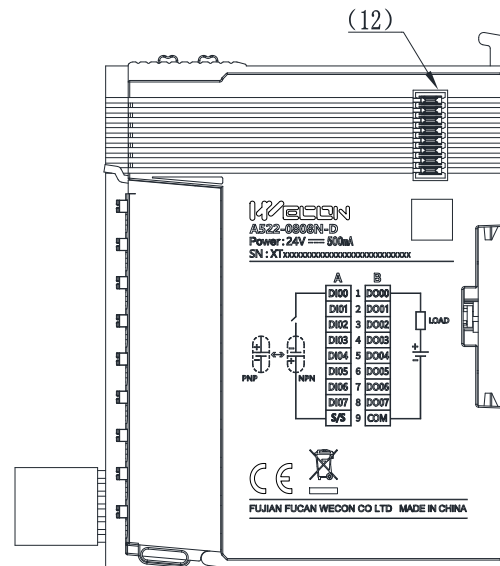
6 Model composition and product specifications



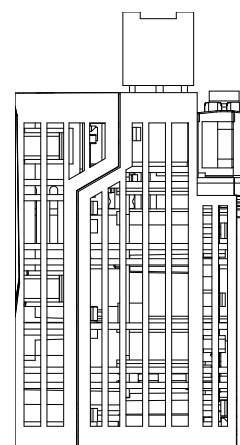
Main view



Top view



Right view

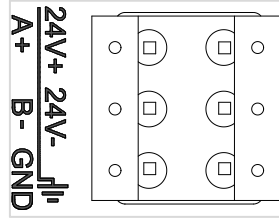


Bottom view

- | | |
|---|----------------------------|
| (1) Expansion card slot: Optional | (5) USB port |
| (2) Expansion card slot: Optional | (6) EtherCAT port |
| (3) DIN rail clip | (7) EtherNet port |
| (4) Function area indicators | (8) COM1- RS485 port |
| ● PWR: Power status indicator | (9) Power port |
| ● RUN: Run status indicator | (10) I/O indicators |
| ● ERR: Error status indicator | (11) I/O terminals |
| ● COM1: COM1 communication indicator | (12) Expansion module port |
| ● ERUN: EtherCAT run status indicator | (13) RUN/STOP mode switch |
| ● EERR: EtherCAT error status indicator | |

7 Communication interface definition

The RS485 communication port and power port share one terminal block. The left side of the terminal block is for RS485 communication, and the right side is for 24 V power supply. The signal pin definitions are as follows:



Signal	Left side terminal	Right side terminal	Description
RS485+	A+	24V+	24V power supply positive input
RS485-	B-	24V-	24V power supply negative input
Ground	GND		PE

8 Model name system and types

Refer to the model label on the side of the device for the model name of the PLC.

Basic Unit Model Composition:

A5 2 □ - 08 08 N - D
 ① ② ③ ④ ⑤ ⑥ ⑦

The ① to ⑦ in the model name structure represents the following specifications:

- ① Host model
- ② 2 Ethernet communication ports
- ③ Bus axis load capacity: Axis count = $4 \times (2^N)^{\text{Note}}$
- ④ Input points
- ⑤ Output points
- ⑥ N = NPN type DO, P = PNP type DO
- ⑦ D = DC power supply

Note: This calculation rule applies only when $N \neq 0$.

9 Electrical specifications

DC power supply

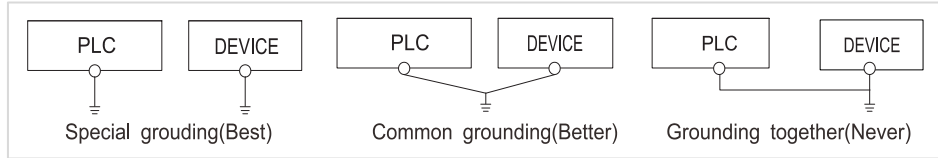
Item	A5 series model
Rated voltage	DC 24 V
Voltage range	DC 24 V $\pm$ 10%
Power fuse	250 V 3.15 A
Impulse current	<5 A 1 ms / DC 24 V
Maximum load	<12 W (excluding the expansion module part)

10 Environmental specification

Environmental temperature	Operating temperature: 0 to 55℃ Storage temperature: -20 to 70℃				
Environmental humidity	Working humidity: 10 to 90% RH (no condensation) Storage humidity: ≤90% RH (no condensation)				
Vibration resistance	Conform to JISC0040 standard				
		Frequency	Acceleration	Amplitude	10 times of X, Y, Z (80 minutes from every direction)
	DIN rail mounting	10 to 57 Hz	--	0.035 mm	
		57 to 150 Hz	4.9 m/S ²	--	
	Directly mounting	10 to 57 Hz	--	0.075 mm	
57 to 150 Hz		9.8 m/S ²	--		
Shock resistance	Compliant with JISC0041 standard (147 m/s ² , action time 11 ms, three sinusoidal half-wave pulses in each of X, Y, and Z directions)				
Voltage resistance	AC 1500 V (1 minute)			Compliant with JEM-1021	
Insulation resistance	DC 500 V is more than 5 MΩ				
Grounding	Third grounding (Cannot be co-located with strong current systems) ※1				
Usage environment	No corrosive and flammable gas, no large amount of conductive dust.				
EMC immunity level	Zone B IEC 61131-2				
Altitude requirements	≤2000 m (80 kPa)				
Protection	IP20				

level	
Mounting method	Snap on mounting on IEC 60715 standard rail (35 mm width, 1 mm thickness)

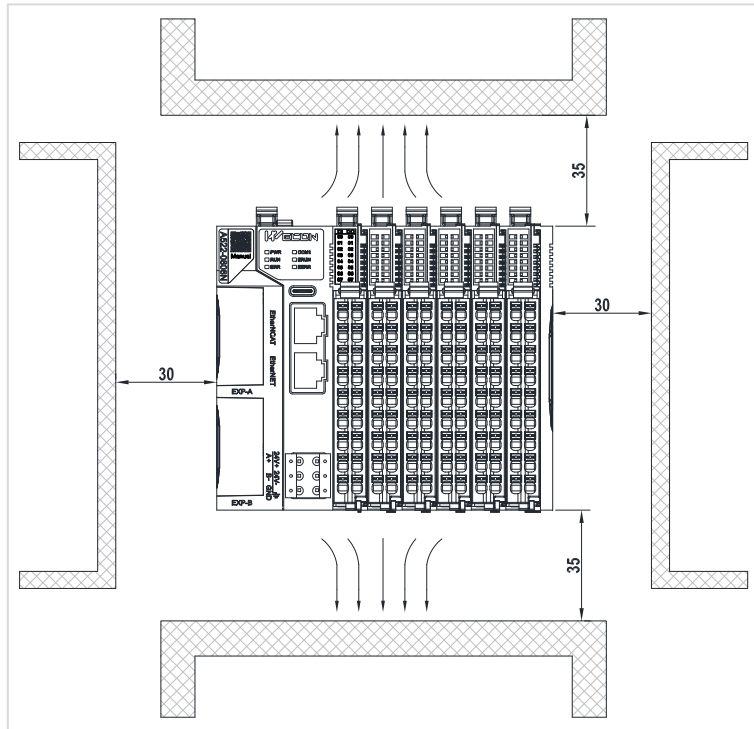
※1



- **Special grounding:** The PLC is grounded separately from other devices. Suitable for applications without analog signal transmission requirements. This provides the best immunity against interference for the PLC with short ground wires.
- **Common grounding:** The PLC and other devices connect to the same ground point. Suitable for applications requiring analog signal transmission, with relatively long leads.
- **Grounding together:** The ground wire of the PLC is connected to the ground wires of other devices before connecting to earth. Suitable for applications requiring analog signal transmission. The PLC ground wire is susceptible to radiation interference from other devices; leads are relatively long, while wiring is simple.

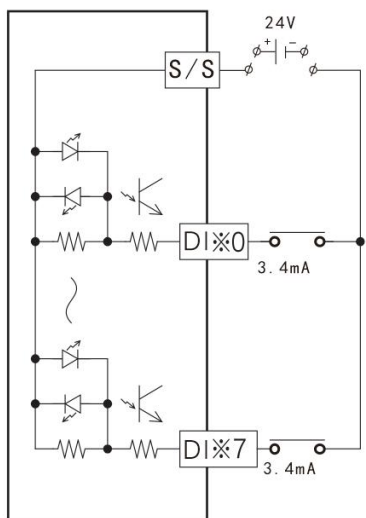
Mounting position

Mount this device horizontally with natural convection heat dissipation. Keep sufficient wiring space and minimum clearances around the device for normal ventilation and cooling, as shown in the figure below.

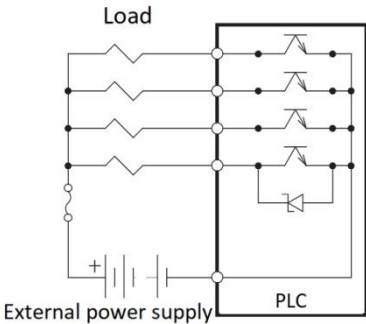


11 Input specifications

The specifications of the A5 series programmable controller base unit are shown in the table below.

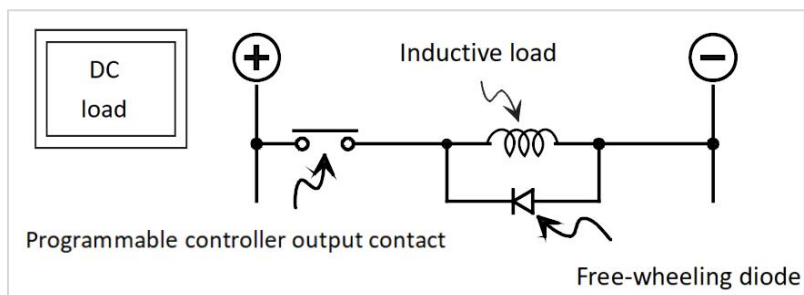
Item	Digital input	
Number of input channels	8-channel input	
Input signal voltage	DC 24 V $\pm$ 10%	
Input signal current	High speed input point: 3.4 mA / DC 24 V	
Input ON current	High speed input point: Above 2.7 mA	
Input OFF current	<1.5 mA	
Input response time	Maximum response 1 μ s, configurable via software	
Input signal form	NPN / PNP	
Circuit insulation	Integrated chip capacitance isolation mode	
Input action indication	LED turns ON when input is active	
Input circuit configuration		The figure shows the NPN wiring, connect S/S to DC 24 V negative and DI to positive for PNP wiring.

12 Output specifications

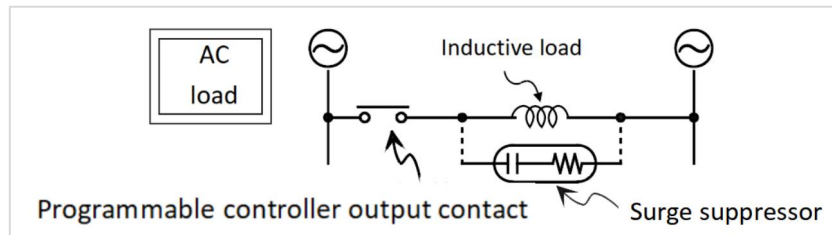
Model		A5 series
Item		8-channel transistor output
Output circuit configuration		
External power supply		DC 5 to 30 V
Circuit insulation		Integrated chip capacitance isolation mode
Action indication		LED turns ON when driven
Max.load	Resistance	0.4 A / point, 3.2A / module
	Inductive	9.6 W / point, 24 W / module
	Lamp	5 W / point, 10 W / module
Open circuit leakage current		< 20 μ A / DC 24 V
Min.load		—
Response time	ON $\rightarrow$ OFF	2 μ s
	OFF $\rightarrow$ ON	1 μ s
Output signal mode		NPN mode

Output circuit configuration

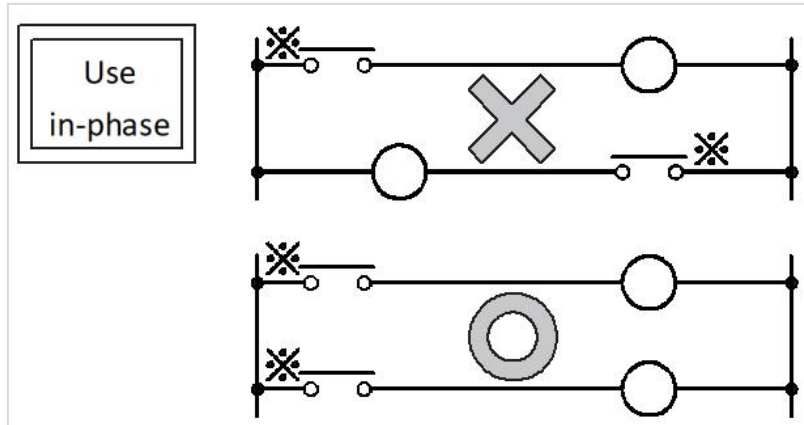
- Please put the perceptual load and DC free-wheeling diode in parallel, otherwise it will significantly reduce the service life of contact.
Reverse voltage of Fly-wheel diode is 5 to 10 times bigger than the load voltage, positive current value is higher than load current.



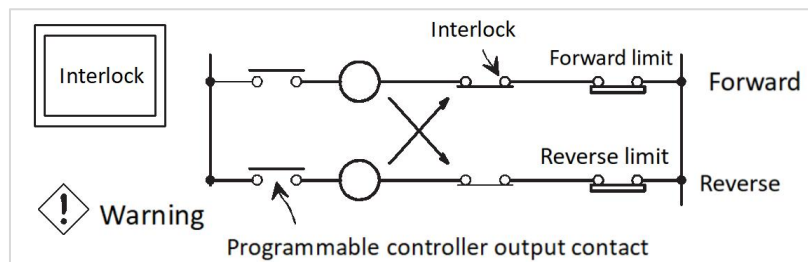
- For AC inductive loads, connect a surge suppressor in parallel to reduce noise.



- It is best to use a programmable output contact on the non-inverting side.



- It is very dangerous to close the forward and reverse contactors at the same time. In addition to the interlocking program inside the programmable controller, this type of load must also have an interlocking device outside the programmable controller.



13 Terminal introduction

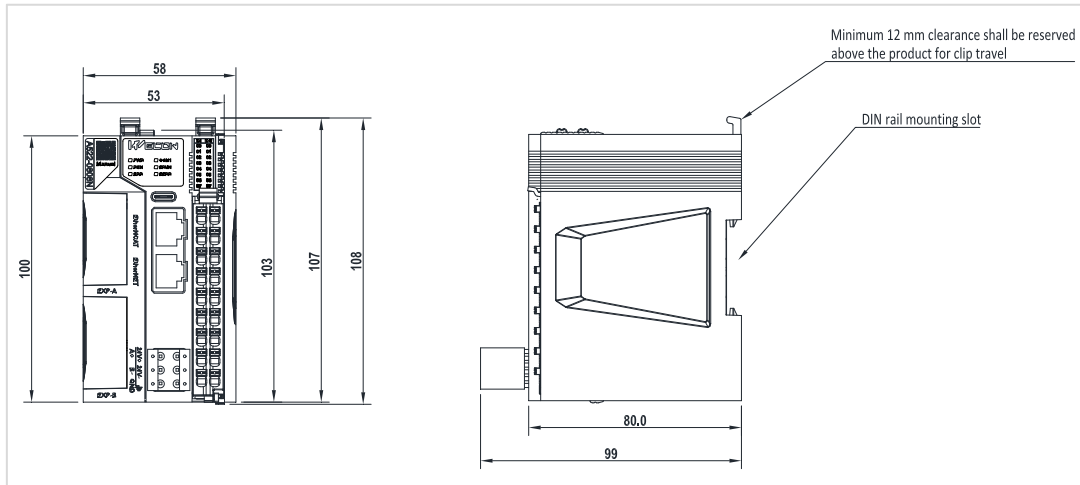
Please refer to the table below for the locations of the signal input/output terminals and power input terminals on the panel of the A5 series PLC.

Pin	Function description
	Ground wire terminal PE
24V DC+	DC 24 V positive input
24V DC-	DC 24 V negative input
S/S	It allows users to select the input mode. Connection with +24V indicates support for drain input mode; Connecting to COM indicates support for source input.
DI00-DI07	Digital signal input terminal
DO00-DO07	Digital signal output terminal
COM	Common terminal of digital output point

14 Installation method and dimensions

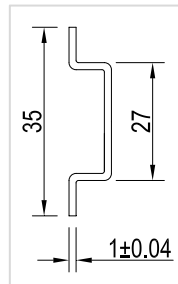
Mounting dimension

Mounting dimensions are shown in the figure below. Unit: mm.



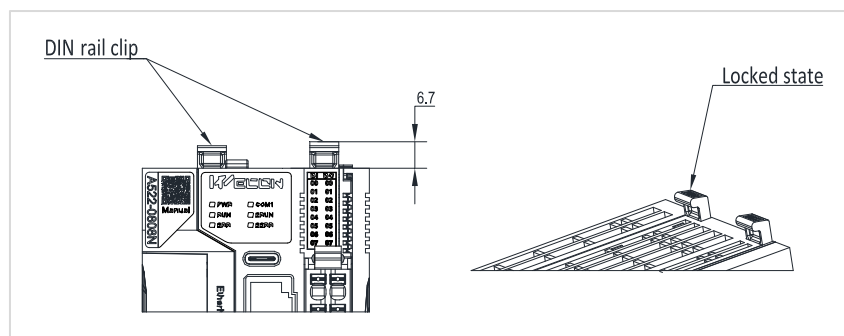
Mounting method

The host uses DIN rail mounting. The DIN rail shall comply with IEC 60715 (Width: 35 mm, thickness: 1 mm). Refer to the figure below for dimensions. Unit: mm. Pull the DIN rail latch to remove the host.



DIN rail clip locking and unlocking diagram

If the DIN rail clip is in the lower position, the device is in the locked state.



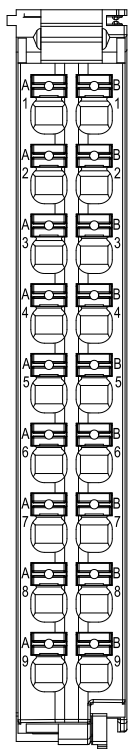
If the DIN rail clip is in the upper position, the device in the unlocked state.



15 Basic unit terminal arrangement

The terminal arrangement of the A5 series is as follows:

<A520/A521/A522/A523-0808N-D>



Left-side signal	Left-side terminal	Right-side terminal	Right-side signal
DI00	A1	B1	DO00
DI01	A2	B2	DO01
DI02	A3	B3	DO02
DI03	A4	B4	DO03
DI04	A5	B5	DO04
DI05	A6	B6	DO05
DI06	A7	B7	DO06
DI07	A8	B8	DO07
S/S	A9	B9	COM

Notice

The contents of this manual are subject to change without notice.



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