SMC

TECHNICAL INSTRUCTION MANUAL FOR SI UNIT CORRESPONDING TO OMRON PLC

EX120-STA1

EX121-STA1

EX130-STA1

SMC CORPORATION

Contents

1. Outline

SYSBUS Remote I/O (Wire) System

(1) SYSBUS Remote I/O (Wire) System is a Remote I/O System whose master station is C500-RM201 and C200H-RM201 of Series PLC SYSMAC C(Cv) made by OMRON.

(2) Noncentralized control of 16 output point unit can be obtained with a combination of remote I/O master station unit and transmission terminal. Wiring Saving is realized by Double Wiring System.

(3) Maximum 32 transmission terminals can be connected to a remote I/O master station and maximum 512 input/output points can be controlled.

(4) Transmission delay is 16ms/128 points.

SI Manifold Solenoid Valve

(1) SI Manifold Solenoid Valve has a remote I/O unit (output unit) that can be connected to SYSBUS Remote I/O System of Series PLC SYSMAC C(Cv) made by OMRON.

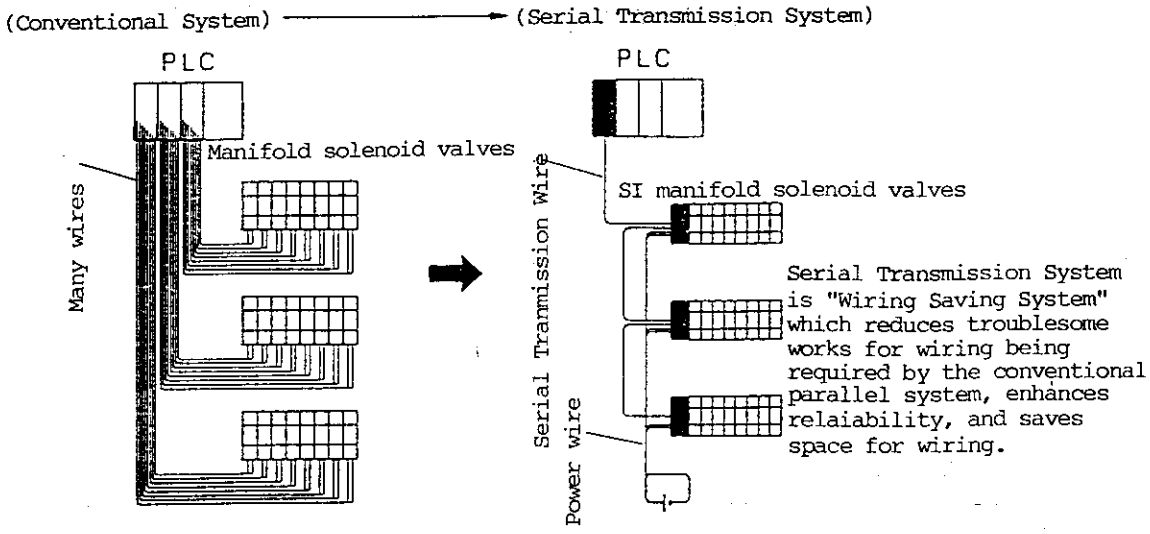
(2) It saves man-hour for wiring as it only requires Double Core Cable for connecting PLC.

(3) Its output point is 16 maximum. Up to 32 terminals can be connected to one master station made by OMRON.

2.Characteristics and System Configuration

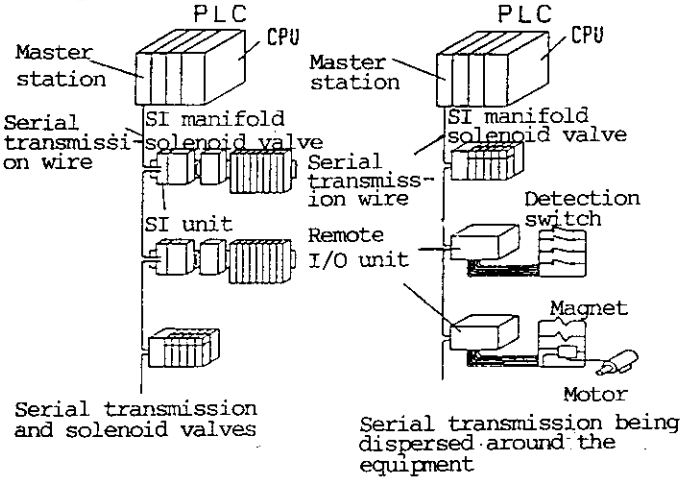
2-1 Characteristics

The transmission system saves wiring.



*A large number of solenoid valves can be controlled by one serial transmission wire

Considerable reduction in man-hour for wiring can be realized by SMC's Serial Transmission System due to direct serial transmission from the PLC (Programmable Logic Controller) master station.



*Noncentralized control of 16 point unit can be obtained

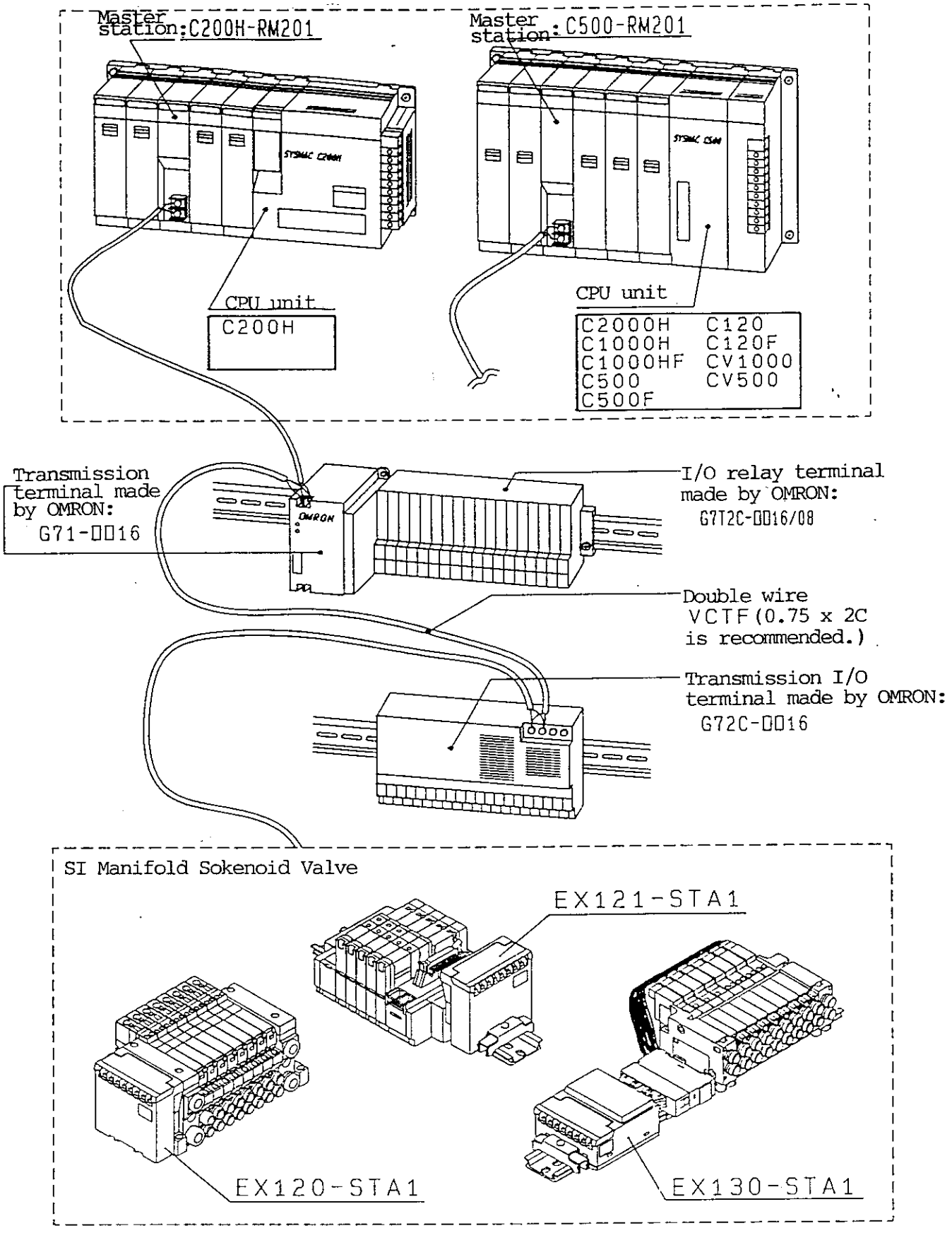
For SI manifold solenoid valve, up to 512 output points (16 points each) can be connected per PLC master station.

Considerable reduction in maintenance work

You are released from maintenance work for troubleshooting and the reliability will be enhanced due to single serial transmission wire.

2-2 System Configuration

Series CYSMAC C(CV) made by OMRON



3.Applicable PLC

SI unit is connected to SYSBUS System of Series PLC SYSMAC C(Cv) made by OMRON.
SYSBUS System requires CPU unit and Remote I/O unit made by OMRON as shown below.

CPU unit	Remote I/O master unit
C2000 C1000H C1000HF C500 C500F C120 C120F CV1000 CV500	C500-RM201
C200H*	C200H-RM201

*Please note that C200H-CPU02 can not be used with Remote I/O unit.

4.Applicable Solenoid Valve

Solenoid valve / SI unit	VQ Base mounted type			VQ Flip type		VQ Cassette type	SX Base mounted type	SY Base mounted type
	Plug-in	Plug lead		Plug-in	Plug lead	Plug lead	Plug-in	Plug-in
	VQ1000 VQ2000	VQ0000	VQ1000	VQ1000	VQ000 VQ1000 VQ2000	VQ1000	SX3000 SX5000	SY3000 SY5000
EX120-STA1	○							
EX121-STA1			○			○	○	○
EX130-STA1		○		○	○			

*For details of solenoid valves and manifold, please refer to catalogs below.
VQ Series (Base Mounted Type)
VQ Series (Body Ported Type)
SX Series
SY Series

5.Specifications

5-1 General Specifications

Item		Specifications
Operating ambient temperature		0～ +55 ℃ (Max.8 points at ON state). 0 ～ 50 ℃ (All points at ON state)
Operating ambient humidity		35～85%RH(No condensation)
Vibration resistance	Endurance	The small one in either of single amplitude 0.75mm at 10～150Hz or acceleration 10G(4 sweeps in 8 minutes sweep time)
	Malfunction	The small one in either of single amplitude 0.50mm at 10～150Hz or acceleration 7G(4 sweeps in 8 minutes sweep time)
Impact resistance		At the peak acceleration 30G, 3 times from 3 directions
Noise resistance		1000Vp-p Pulse width 100ns～1 μ s Leading 1ns pulse
Withstand voltage		AC1000V50/60Hz 1 min. (between external terminal package and case)
Insulation resistance		10M Ω (with a DC500V insulation tester) (between external terminal package and case)
Operating atmosphere		No corrosive gas and dust

5-2 Performance Specifications

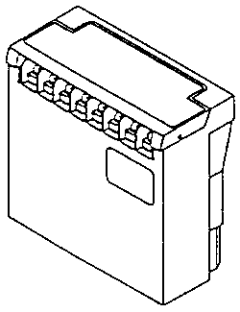
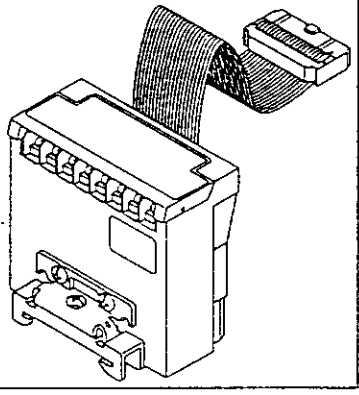
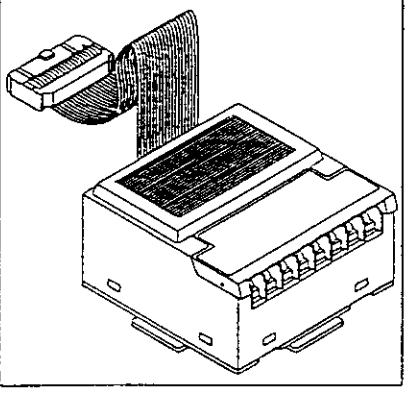
Remote I/O System Specifications

Item	Specifications
Applicable PLC	SYSMAC C(Cv) Series made by OMRON
Remote I/O master station	C500-RM201 and C200H-RM201 for SYSMAC C(Cv) Series
Number of connection terminal	Max.32 stations per Remote I/O master station
Max.number of channels	Max.32 CH (512 points) per Remote I/O master station
Communication speed	187.5KBPS
Transmission delay	16ms/128 points
Transmission distance	200m (total extension)
Transmission path	Double core cable (VCTF0.75 is recommended.)

5-3 SI Unit Specifications

Item	Specifications		
Type of SI unit	EX120-STA1	EX121-STA1	EX130-STA1
Output point	16 points		
Output type	Transistor type (Open collector type)		
Connected load	DC24V, Solenoid valve with lamp surge voltage protection circuit of 2.1W or less		
Residual voltage	0.4V or less		
Power voltage	$D^{+10\%}_{-5\%}$		
Current consumption	0.3A(inside unit)		
Weight	85g or less	130g or less	130g or less
Dimensions	30 × 64 × 60.8mm	40.1 × 64 × 60.8mm	64 × 64 × 35mm

5-4 SI Unit Appearance / How to Order

EX120-STA1	EX121-STA1	EX130-STA1
		

EX1**20**-S**TA**1

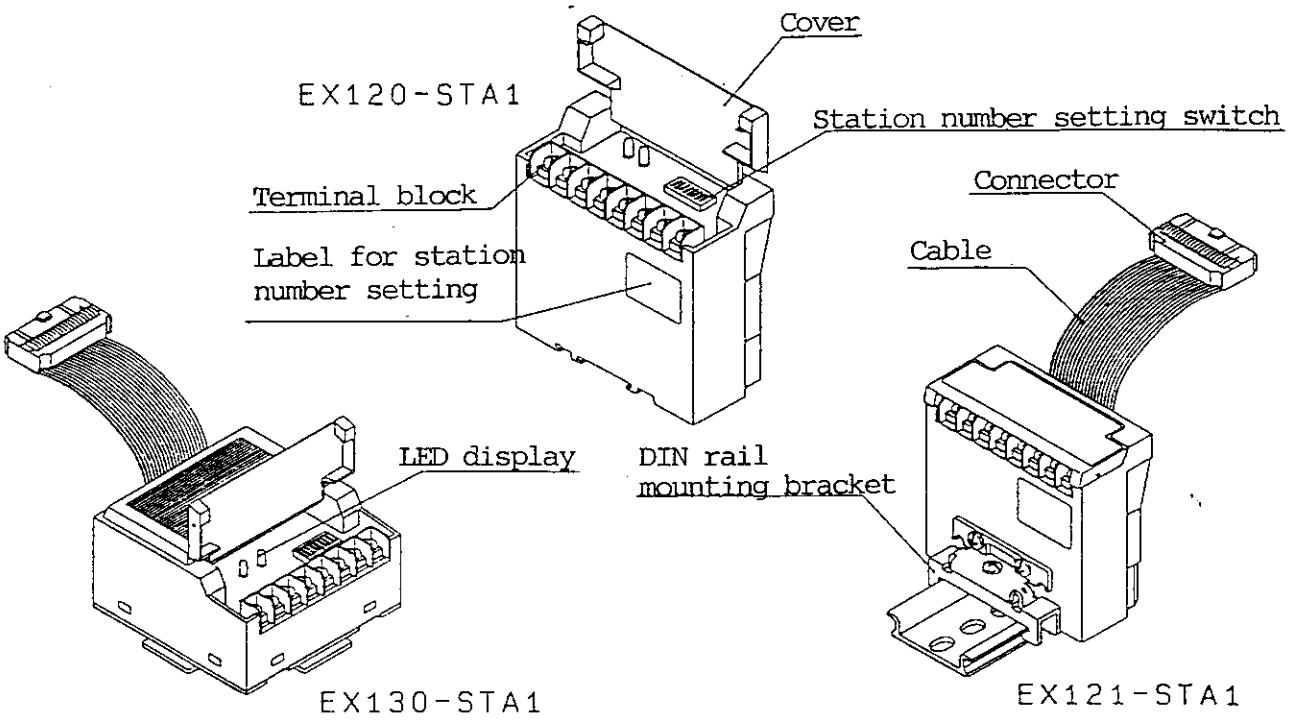
Type of SI unit

20	Vertical direct mount
21	Vertical DIN rail mount
30	Horizontal DIN rail mount

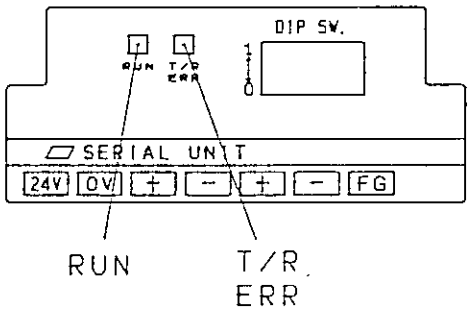
Applicable PLC maker

TA	OMRON : SYSMAC C Series

6.Designation of Each Section for SI Unit

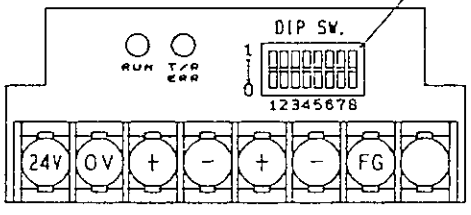


● LED display



LED	Description
RUN	Normal operation PLC/Operation mode : Light
T/R ERR	Normal transmission:Blink Abnormal transmission:Light

● Terminal block



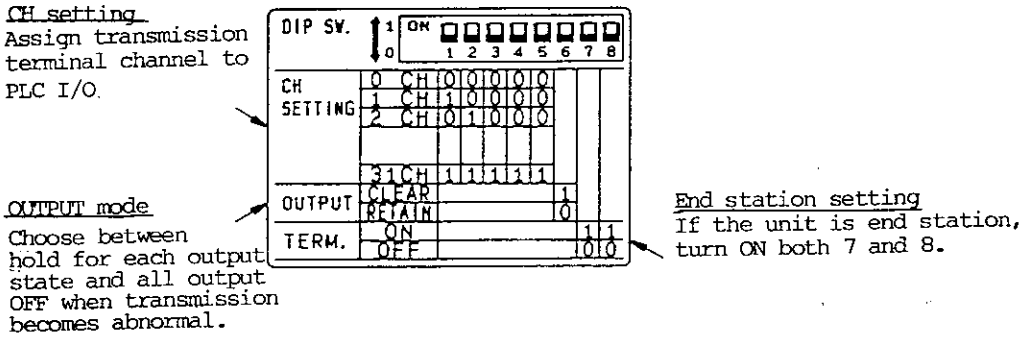
Terminal	Connect to
+	Transmission path (+)
-	Transmission path (-)
24V	Supply power source DC24V
0V	
FG	Grounding conductor and shield

*Terminal thread : M3

*Transmission path (+) and (+), (-) and (-) are connected inside.

7.Switch Setting

Open the cover and set the dip switch with a small minus driver. With this switch, channel No. (CH SETTING), output mode (OUTPUT) and end station (TERM.) can be set. Setting should be performed at power OFF state.



The following points should be considered for setting.

(1)Channel setting (CH SETTING)

The setting range is 0～31(binary setting).

Duplication with the other device should be avoided for setting.

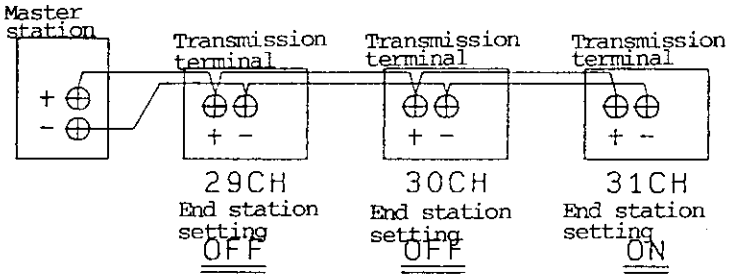
For assignment of channel, please refer to Manual on Remote I/O unit (wire type) for users made by OMRON.

(2)Output mode setting (OUTPUT)

For abnormal transmission due to unit failure or breaking of transmission path, set OFF (CLEAR) or RETAIN all points of each output.

(3)End station setting (TERM.)

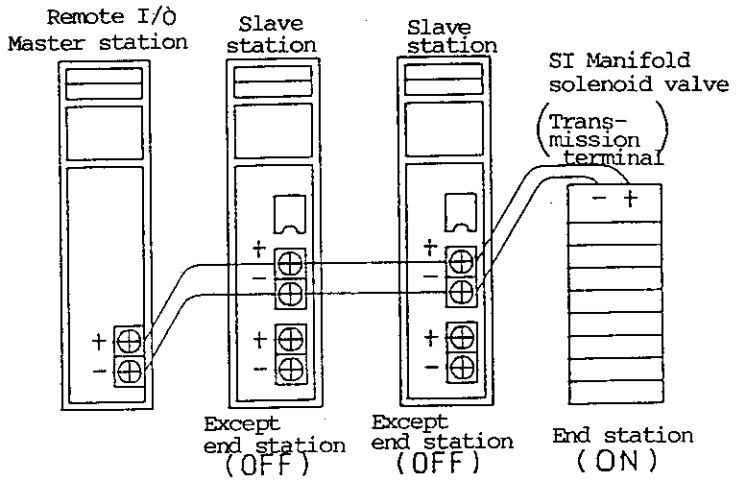
Setting for the terminal located at the most distant from the key station.



8.Wiring

8-1 Double-Core Cable

Remote I/O master station, slave station and transmission terminal are connected with Double-Core Cable as shown below.



Cable

Use Double-Core Cable for connection.

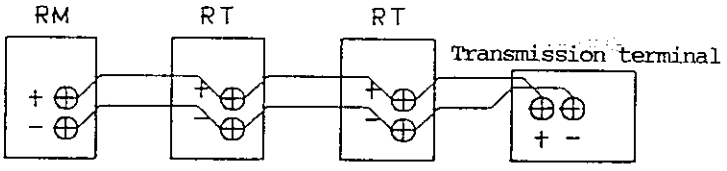
Recommended cable : VCTF 0.75×2C (JIS)

(1)Connect + to+ , − to −.

(2)Wiring should be started from the master station in order.

The last unit being wired is the end station and set it ON.

Example of Remote I/O unit connection



8-2 Power Wiring

Connect to the Power of DC24V +10%, −5%.

For selection of power source and connection cable, please consider the consumption current of solenoid valve and SI unit.

9.Correspondence of Output No. and Solenoid Valve Coil

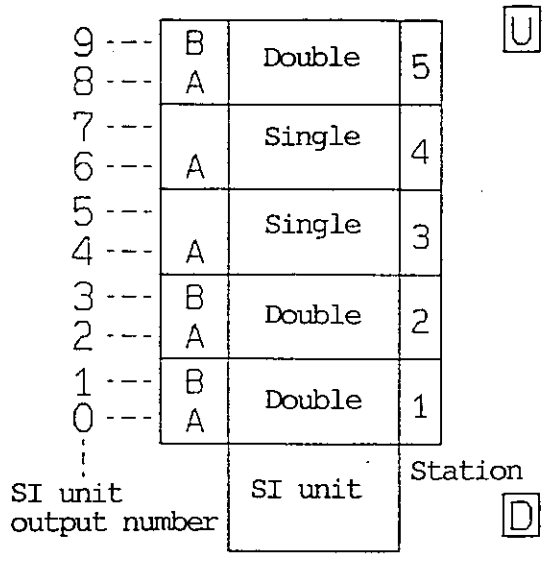
9-1 Standard Wiring

For SI unit output, number from the solenoid on D-side. For VQ manifold solenoid valve, as SI unit is on D-side, output number is assigned from the side of SI unit.

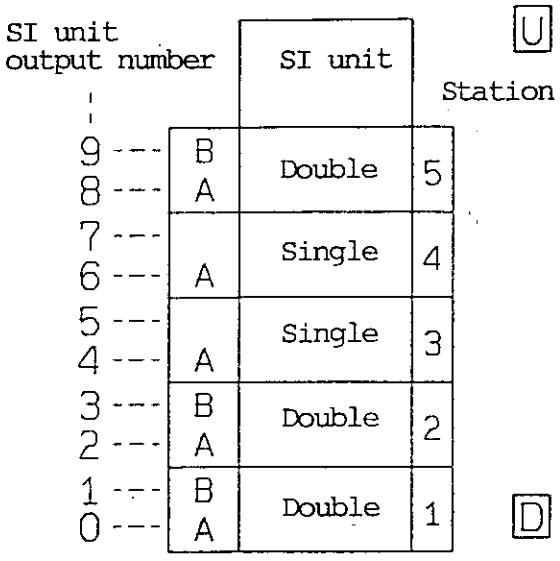
For SX/SY manifold solenoid valves, as SI unit can be mounted on both D-side and U-side, when SI unit is mounted on U-side, output number is assigned from the solenoid on the opposite side of SI unit.

For manifold which has stations less than 8, all manifold internal wiring should be double wiring.

Example 1.VQ manifold solenoid valve



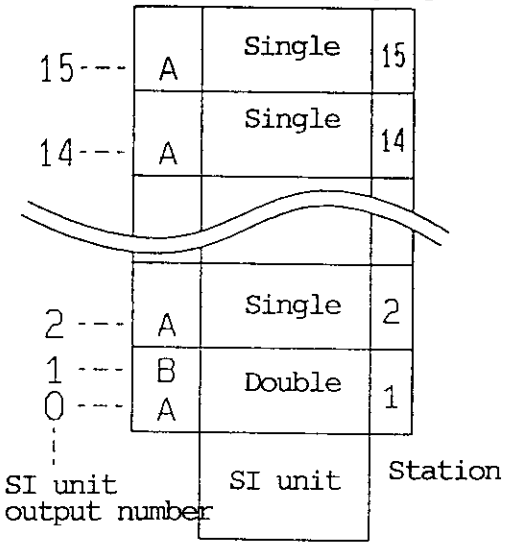
Example 2 .SX,SY manifold solenoid valve (U side)



For above cases of wiring, the 3rd and 4th stations can be changed from single to double. In that case, output number for the 3rd solenoid's B-side is 5, that for 4th is 7.

9-2 Mixed Wiring

For option, mixed wiring is provided. In this case, maximum number of



The internal wiring of manifold is fixed according to the solenoid valve loaded, single or double. In this case, please note that it is not possible to output from the solenoid B-side when changing the solenoid from single to double as internal wiring is not provided there.

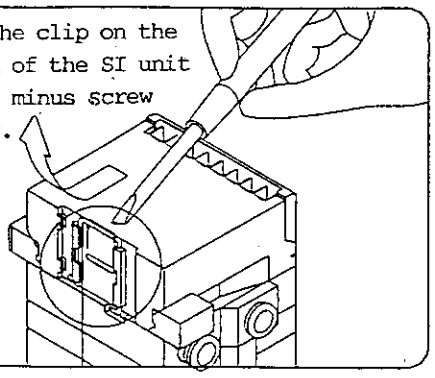
For mixed wiring, specifications for wiring should be specified.

10. Mounting / Dismantling Method

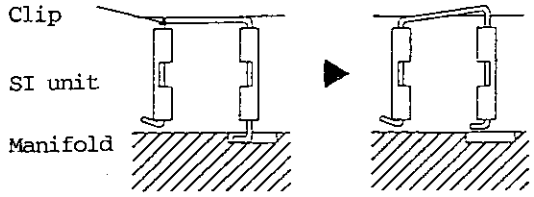
10-1 EX120-STA1

· Dismantling

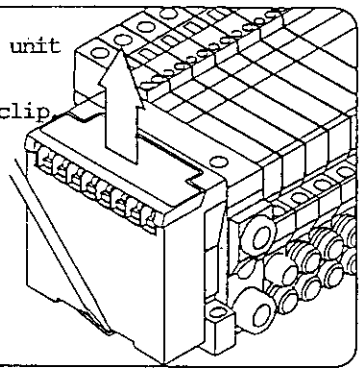
1. Pull the clip on the bottom of the SI unit with a minus screw driver.



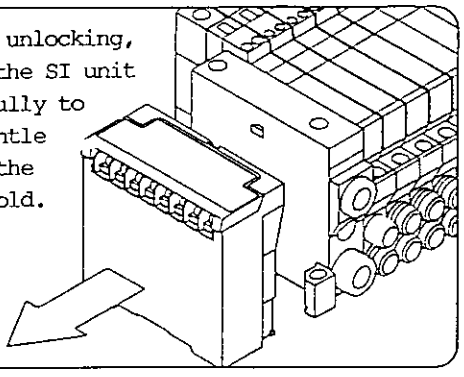
2. Hook is undone when pulling the clip and the SI unit is released from fixing.



3. Slide the SI unit upward while pulling the clip.

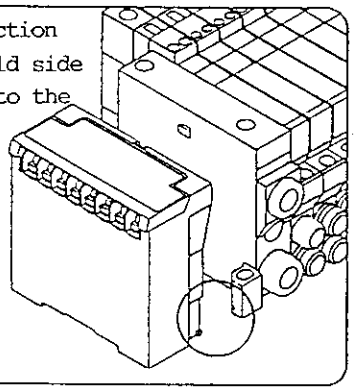


4. After unlocking, pull the SI unit carefully to dismantle from the manifold.

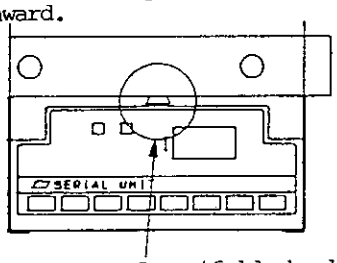


· Mounting

1. Fit the projection on the manifold side of SI unit into the groove of manifold.



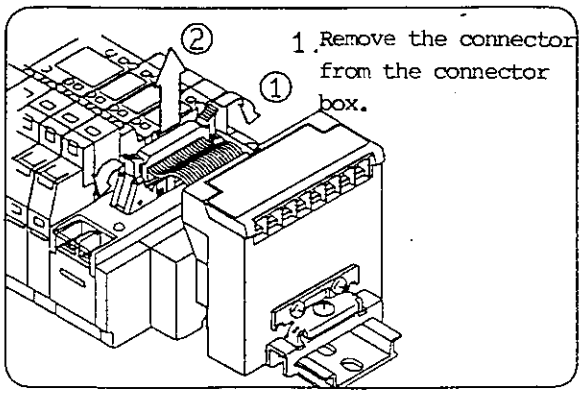
2. See if the manifold and the SI unit are fixed firmly and slide the SI unit downward.



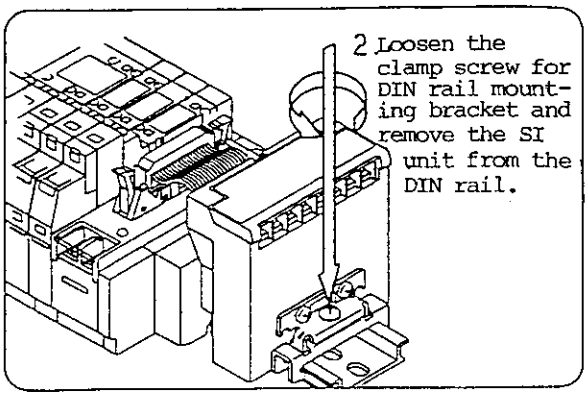
*The claw of manifold should be fixed firmly.

10-2 EX121-STA1

· Dismantling



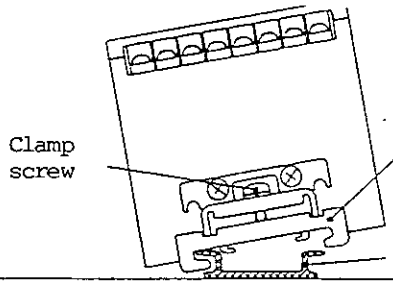
1. Remove the connector from the connector box.



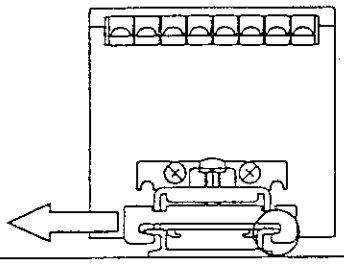
2. Loosen the clamp screw for DIN rail mounting bracket and remove the SI unit from the DIN rail.

· Mounting

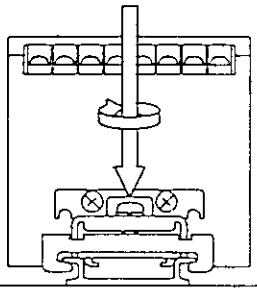
1. Hook the SI unit to the DIN rail from its left side (which has the large claw) with the clamp screw loosened.



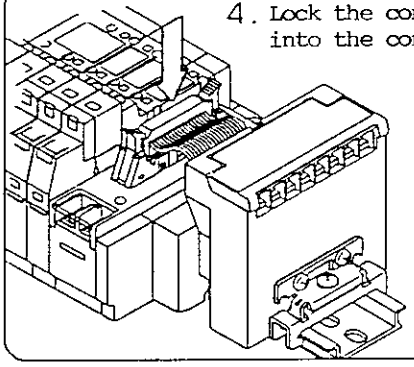
2. After installing on the DIN rail, slide the DIN rail mounting bracket to the left to hook the claw on the right side to the DIN rail.



3. Fasten the clamp screw.



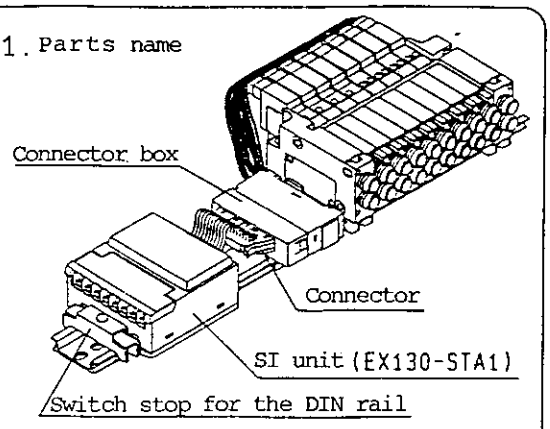
4. Lock the connector into the connector box.



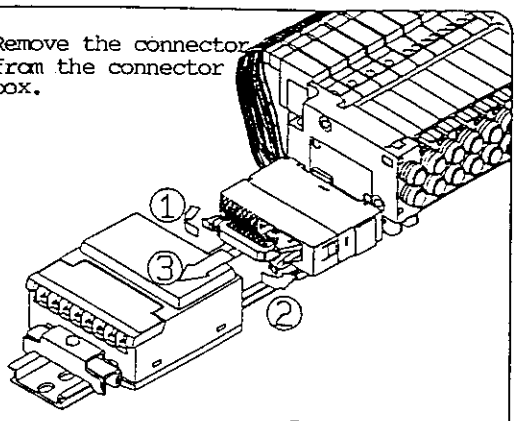
10-3 EX130-STA1

·Dismantling

1. Parts name

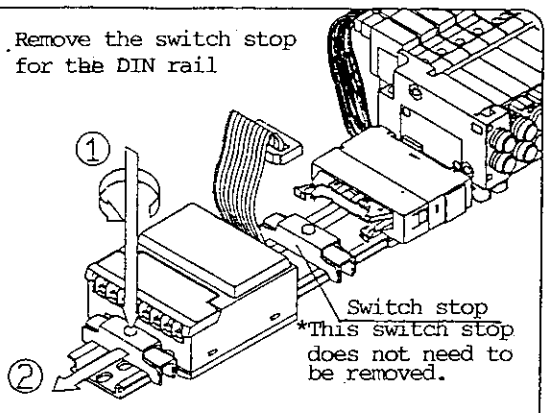


2. Remove the connector from the connector box.



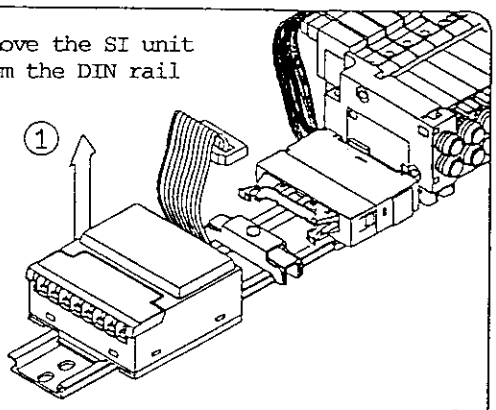
First unhook in order of ① and ②.
Then slide the connector on the side of SI unit to the direction of ③.

3. Remove the switch stop for the DIN rail



Loosen the screw (M4) for the switch stop with a driver and slide the switch stop to the direction of ② or remvoe it.

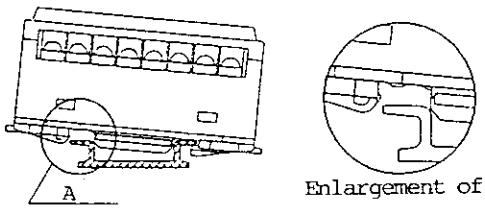
4. Remove the SI unit from the DIN rail



Lift up the SI unit to the direction of ①.
For details, please refer to 5.

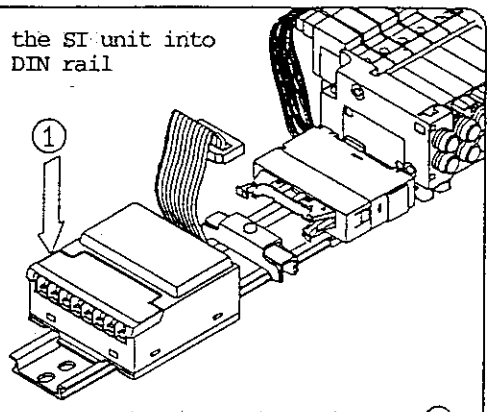
5. Remove the SI unit from the DIN rail (Details for 4)

Lift up the left side of the SI unit.
It is easy to remove as the sI unit is mounted on the DIN rail with hook as shown below.



• Mounting

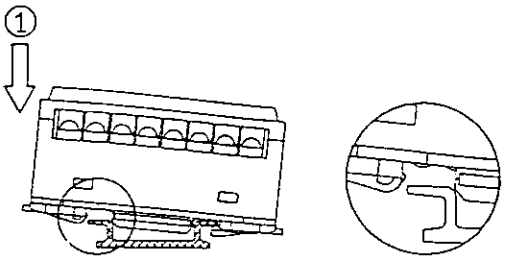
1. Fix the SI unit into the DIN rail



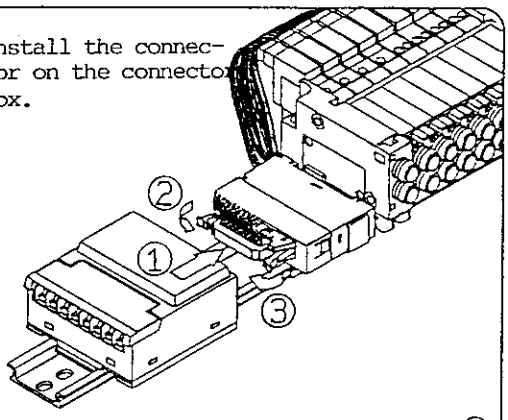
Push the SI unit to the direction of ①.
For details, please refer to ②.

2. Fix the SI unit into the DIN rail

Push the left side of the SI unit to the direction of ① .
It is easy to mount for the hook of SI unit.

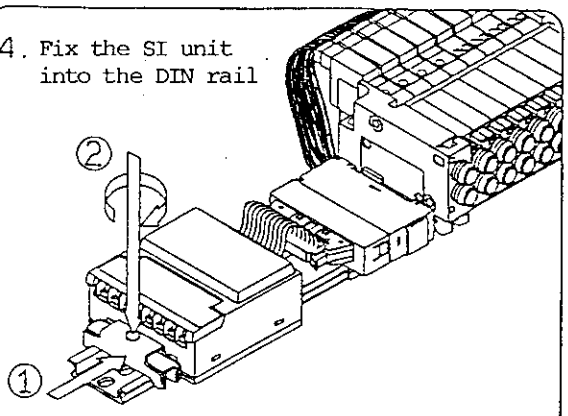


3. Install the connector on the connector box.



Slide the connector to the direction of ① to install and hook in the direction of ② and ③ .

4. Fix the SI unit into the DIN rail



Set the switch stop to the direction of ① and fasten the screw (M4) with a driver as shown in ②.

11. Troubleshooting

The following is a flow chart in the case of when a SI unit does not operate properly. For the system troubleshooting, refer to the user's manual prepared by Omron.