TECHNICAL INSTRUCTION MANUAL
FOR
SI MANIFOLD SOLENOID VALVE

(IN313-AB2 CORRESPOND TO ALLEN-BRADLEY Co.)

SMC CORPORATION

－Index－

1. Outline

Remote I/O(RIO) system made by Allen-Bradley CO.:-

(1) is the remort I/O(RIO) system in which the PLC made by Allen-Bradley Co., or the unit except for the PLC, is a master station,

(2) enables a variance control of 16-point unit in combination with the master station,

(3) can reduce a great number of wiring as the master station unit body is connected to a twist pair cable with shield.

(4) can connect max. 32 units when a slave station's Terminater is 82Ω and max. 16 units when a slave station's Terminater is 150Ω for 1 channel of PLC master station unit.

(5) can switch 57.6Kbps, 115.2Kbps and 230.4Kbps of transmission speed.

[Note] This product is incorporates a communication link which is licensed under patents and propriertary technology of Allen-Bradley Company, Inc. Allen-Bradley does not warrant or support this product All warranty and support services for this product are the responsibility of and provided by SMC Corporation.

SI Manifold solenoid valve:-

(1) Manifold solenoid valve include a exclusive output Remote I/O(SI unit) with can be connected to the remote I/O(RIO) of PLC made by Allen-Bradley Co.

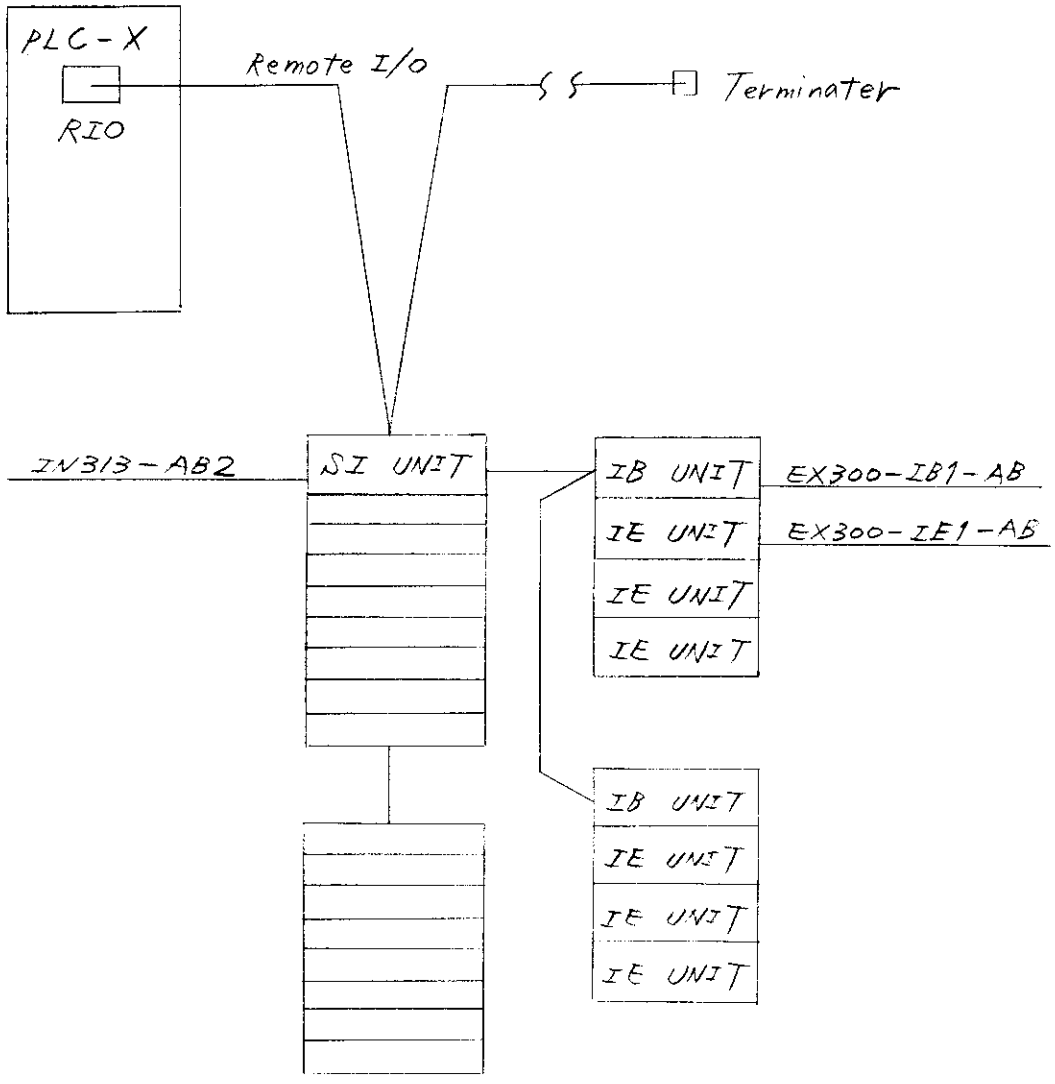
(2) can wire by a twist pair cable with shield in connection with PLC and can reduce the man-hour.

(3) can connect max. 32 units in the case where the Terminater is 82 Ω and max. 16 units in the case where the Terminater is 150 Ω, and its output is 16 points.

[Note] The number of connecting units depends on the master station. Ask Allen-Bradley Co. in detail.

2. System structure

2-1. Whole structure



PLC-X shows PLC series unit made by Allen-Bradley Co. built-in a terminal of RIO (Remote I/O).
Please ask Allen-Bradley Co. in detail.

2-2. Applicable PLC

This is used for PLC which needs the remote I/O system(RIO network) of Allen-Bradley Co.
Also, there is the equipment which supports RIO except series.
Please contact Allen-Bradley Co. for further details.

(Typical examples of PLC series)

*PLC-2/20

*PLC-2/30

*PLC-3 family processors

*PLC-5/15

PLC-5/25

PLC-5/40 - 5/40L

PLC-5/60 - 5/60L

PLC-5/250

(Typical examples except PLC)

There are various RIO master products except PLC series such as VME scanner, IBM PC scanner, Q-BUS scanner and so on.

2-3. Applicable solenoid valve

Solenoid valves which can be applied to SI manifold solenoid valve are shown in the following table.

Solenoid valve series	Sealing	Cv facto
VZS2000	Metal seal	0.35
VZS3000	Metal seal	0.73
VFS2000	Metal seal	0.83
VFS3000	Metal seal	2.0
VFS4000	Metal seal	3.6
VFS5000	Metal seal	5.7
VFR2000	Elastic seal	0.9
VFR3000	Elastic seal	2.3
VFR4000	Elastic seal	3.7

3. Specification

3-1. General specification

Item	Specification
Operating ambient temp.	0～+50℃
Operating ambient humidity	35～85% RH (No dewing)
Vibration resistance	5G (According to JIS C0911: 10-55Hz. Duplex amplitude 0.5mm)
Impact resistance	10G (According to JIS C0911)
Noise resistance	1000Vp-p Pulse width 1μs leading 1ns pulse
Dielecric srength	1000VAC 50/60Hz for a minute between external terminal package and case.
Insulation resistance	10M Ω or over (at 500VDC megger between external package and case.
Operating Atmosphere	No corrosive gas

3-2. Performance specification

Item	Specification
Applicable PLC	PLC series made by A-B Co.
Remote I/O master station	RIO built-in PLC
Number of connection terminal for a master station	16 units for 1CH of the remote I/O master station 1 unit (In case of end resistance 150Ω) 32 units (In case of end resistance 82Ω)
Number of CH for in connecting use of master station	Max. 4 CH per the remote I/O master station
Correspondence speed	57.6Kbit/sec・115.2Kbit/sec・230.4Kbit/sec
Transmission distance	10,000 feet about 3,050m in case of 57.6Kbit/sec 5,000 feet about 1,525m in case of 115.2Kbit/sec Now in use is not decided in case of 230.4Kbit/sec
Transmission path	Twist pair cable with shield

3-3. SI unit specification

Item	Specification
External connecting system	M3 screw
Power voltage	For solenoid valve DC24V+10%, -5% For unit internal DC24V±10%
Power consumption	For solenoid valve Max. 4.0A For unit internal Max. 0.2A
Input/Output point	Input 32／Output 32 points
Output type	Transistor type (Open-collector type)
Residual voltage	1.0V or less
Weight	0.7Kg or less
Dimensions	112×54×72mm

3-4. IB unit specification

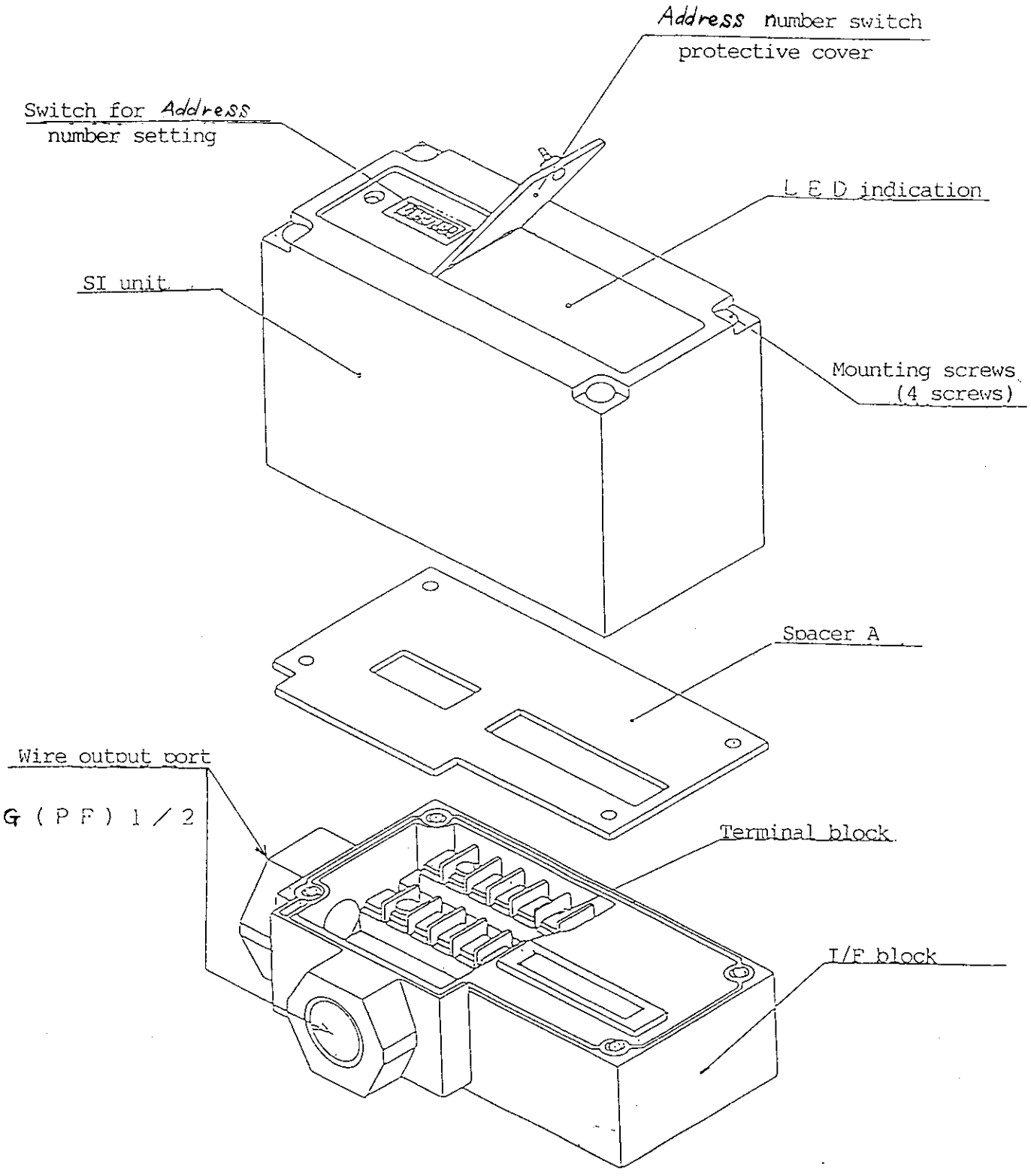
Item	Specification
Mounting	DIN rail fix
Number of extension unit	4 units(Including IB unit)
Power voltage	DC24V±10%
Power consumption	Max. 0.2A (IB 1 unit, IE 3 units)
Transmission Speed	500Kbps (Transmission Delay : 1msec)
Transmission Distan	50m (Total length)
Rated input current	6.2mA
ON current	6.0mA (min)
OFF current	3.0mA (max)
Insultation classification	Photo coupler insultation
Weight	About 100g
Dimensions	54×62×50mm

3-5. IE unit specification

Item	Specification
Mounting	DIN rail fix
Power voltage	No external supplying power
Rated input current	6.2mA
ON current	6.0mA (min)
OFF current	3.0mA (max)
Insultation classification	Photo coupler insultation
Weight	About 80g
Dimensions	43×62×50mm

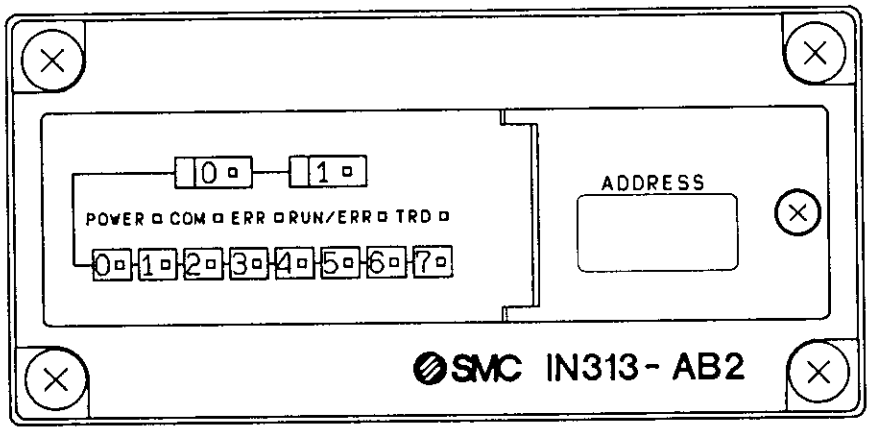
4. Designation of each part

4-1. Designation of each part (SI unit)



4-2. LED indication (SI unit)

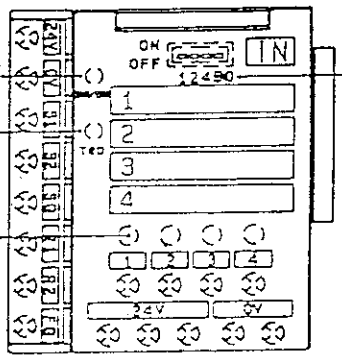
Indication	Desription
POWER	Light at ON of power supply
COM	Light when communication is in normal state. Flashing in communication initialize. Light is put out when communication is not in normal state.
ERR	Light when communication is not normal state.
RUN/ERR (EX300)	Brinking when transmitted data is normal. Lighting on when transmitted data is wrong.
TRD (EX300)	Lighting on while data is being transmitted.
OUTPUT 0, 1	OUTPUT 0 :LED Lights at ON Output 00～0F OUTPUT 1 :LED Lights at ON Output 10～1F
INPUT 0～7	INPUT 0 :LED Lights at ON Input 00～03 INPUT 1 :LED Lights at ON Input 04～07 INPUT 2 :LED Lights at ON Input 08～0B INPUT 3 :LED Lights at ON Input 0C～0F INPUT 4 :LED Lights at ON Input 10～13 INPUT 5 :LED Lights at ON Input 14～17 INPUT 6 :LED Lights at ON Input 18～1B INPUT 7 :LED Lights at ON Input 1C～1F



4-3. Designation of each part (IB unit)

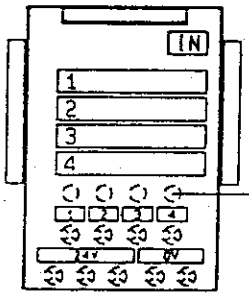
RNU/ERR
:Light ON when the sending data is normal. Flash when it is abnormal.
TRD;Light ON during sending data.

LED 1～4:Display of input



*Dip switch for address setting

4-4. Designation of each part (IE unit)



LED1～4:Display of input

5. Switch setting

5-1. Switch setting SW1 (8 bit) (SI unit)

Open the station number switch protective cover and set a dip switch of 8 bit with a tool such as a minus screw driver.
This switch sets Rack Address and Starting Quarter.
Be sure to set at OFF state of power supply.

(1) Rack Address Setting of 6 bit
The setting range is 00-74 and 61 kinds of setting are available.
(Indicated by octal classification)

(2) Starting Quarter Setting of 2 bit
4 kinds of seting are available as the following.

5-2. Switch setting SW2 (4 bit) (SI unit)

Set a dip switch of 4 bit on bottom board with a tool such as a minus screw driver.
Be sure to set at OFF state of power supply.

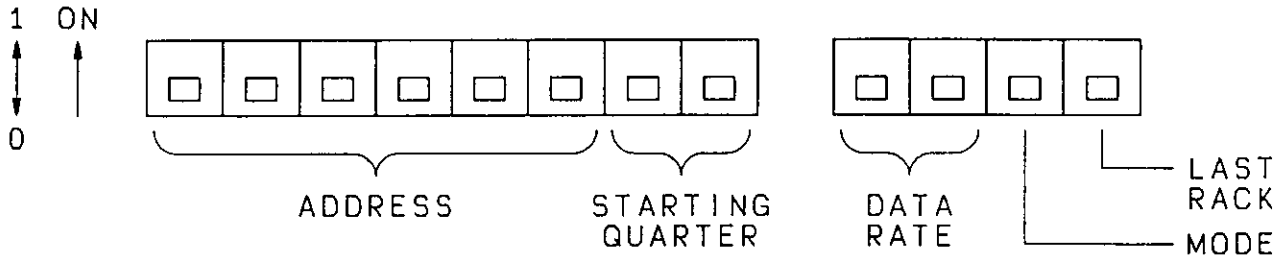
(1) Data Rate Setting of 1 bit
Set 00 in case of 56.7KBPS. as below.
01 in case of 115.2KBPS.
1X in case of 230.4KBPS. (This is not used at present)

(2) Mode Setting of 1 bit
Mode shows Hold Last State.
This is set by 1 bit and operates as below.

Setting	Operation
0 Clear	In case of set 0, the remote I/O (RIO) lets clear output state and stops its operation temporarily when it makes communication error. Also, when it becomes normal signal, the remote I/O (RIO) returns automatically and operares normally.
1 Hold	In case of set 1, the remote I/O (RIO) holds the last normal signal of output state and stops its operation temporarily. Also, when it becomes normal signal, the remote I/O (RIO) returns automatically and operates normally.

(3) Last Rack Setting of 1 bit

Two kinds of setting are available as below.

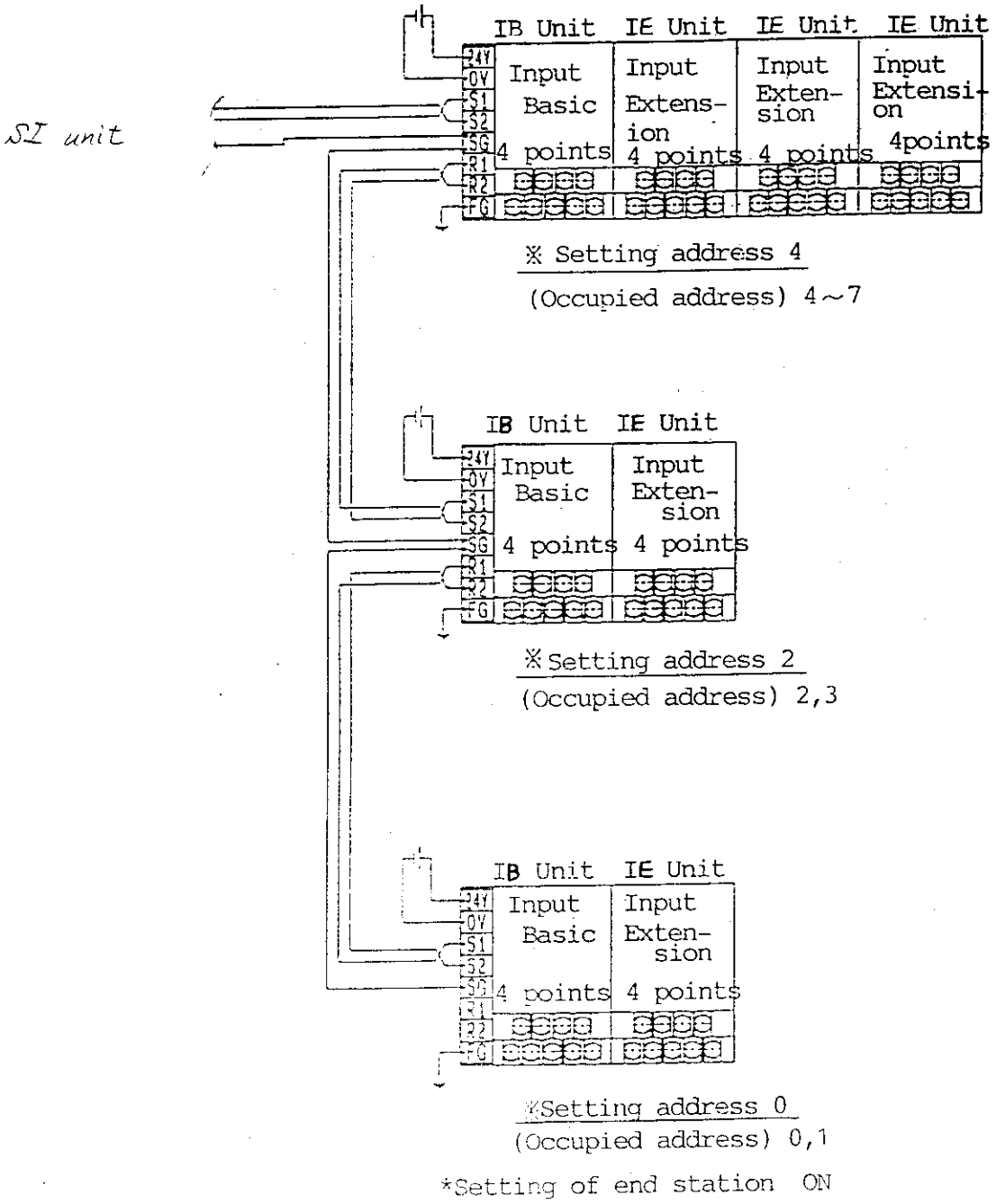


5-3. Switch setting (IB unit)

Address set range of IB unit is 0～7.

1 address occupies input for 4 points.

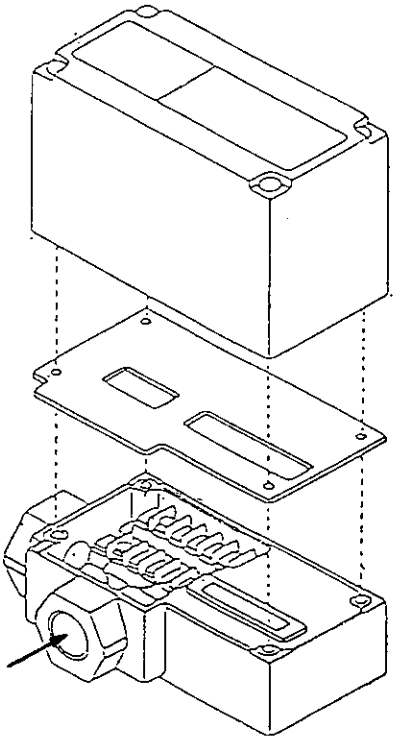
EX.) Occupies 4 addresses when the input point is 16,
occupies 2 addresses when the input point is 8.
Address is set in order of the farthest unit from the SI unit one by one.
Setting address for each IB unit is as follows.



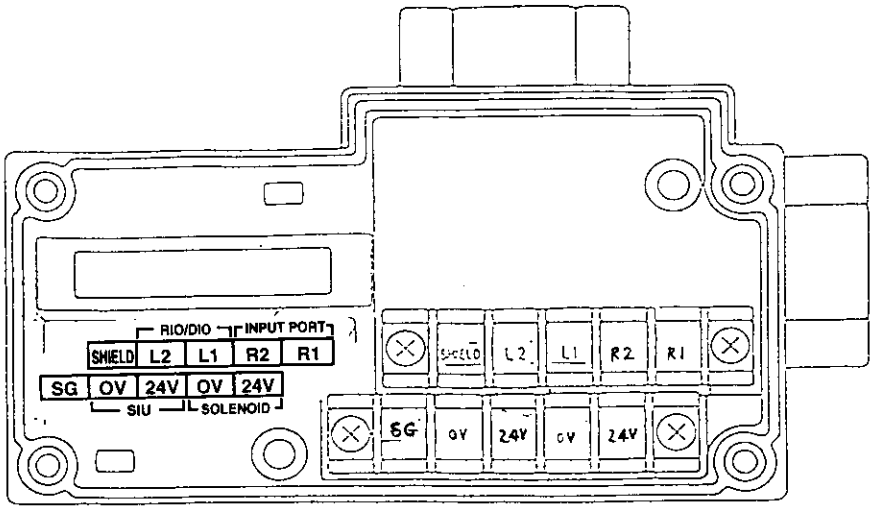
* Sets an end station for the IB Unit which is the farthest from the R Unit.
Address should be set under de-energized condition and the duplication and empty of the address should not be allowed.

6. Wiring

Loosen 4 mounting screws, remove SI unit and spacer A and then wire to terminal block through wiring output port.
M3 screw is used as terminal screw of terminal block. Use a crimp terminal suitable for a terminal block.

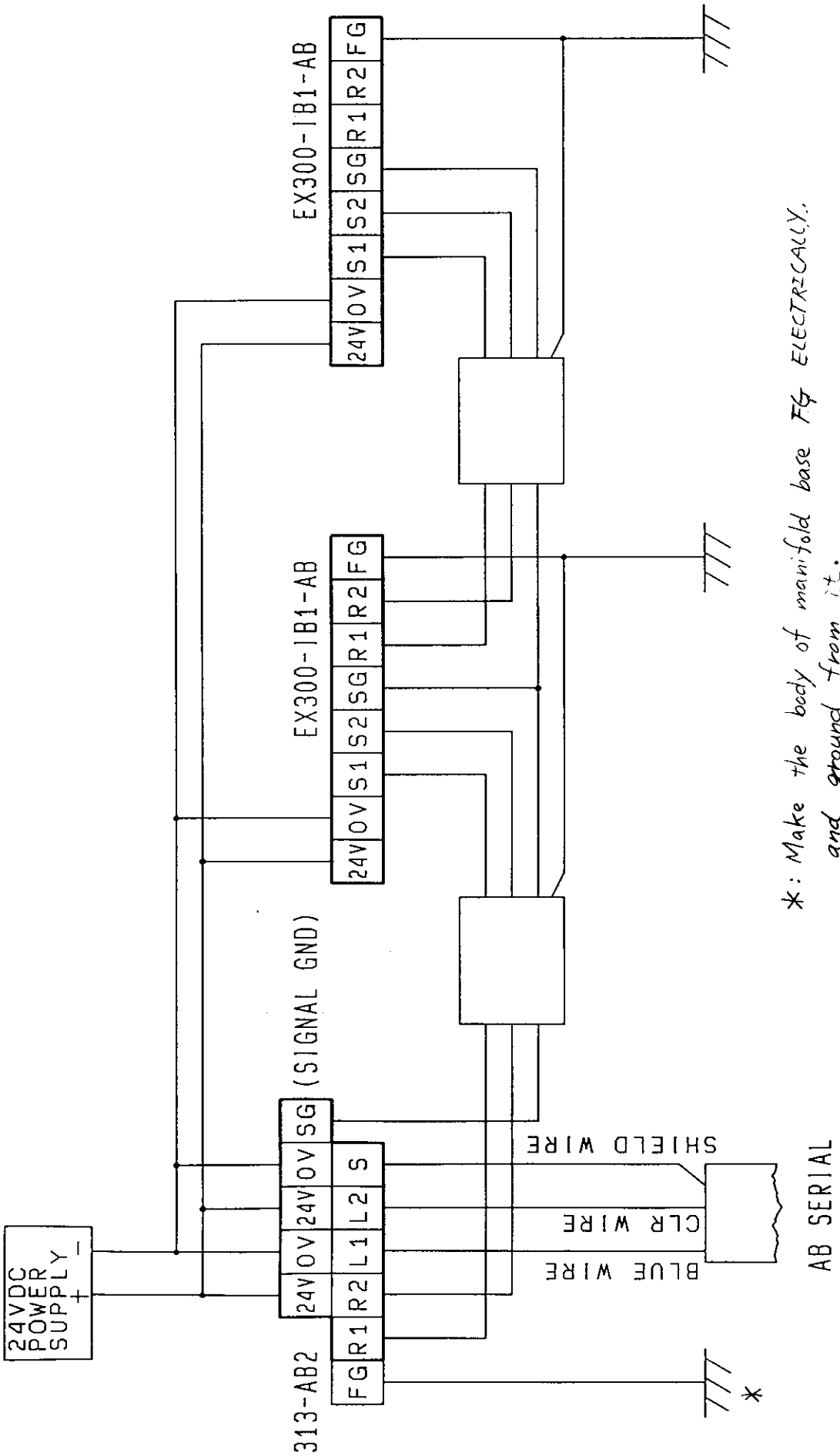


6-1. Terminal block



6-2. Wiring of cable

Wiring of cable should be done as below.



6-3. Power supply wiring

There are three types of externally supplied DC power.

(1) DC24V for solenoid valve (max. 4.0A)
This is a power supply for driving solenoid valve.

(2) DC24V (max. 0.2A) for SI unit
This changes to 5V and is used in internal circuit.

(3) DC24V (max. 0.2A) for IB unit

Connect the power supply of DC24V+10%-5% in (1) and DC24V±10% in (2), (3). As (1), (2) and (3) are insulated inside, both a different power supply and the same power supply are available.