Discontinue

CKD

SM－295301-A

INSTRUCTION MANUAL

BLOCK MANIFOLD

W4G2-SERIES

SERIAL TRANSMISSION TYPE

MW4G※2－T8G※
(APPLICABLE TO CC－Link)

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

4th Edition

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, read this operation manual carefully for proper operation.

Observe the cautions on handling described in this manual, as well as the following instructions:

⚠ PRECAUTIONS

- Incorrect address settings of serial transmission slave stations could cause the solenoid valve and the cylinder to malfunction.
- For operation if serial transmission slave stations, read the communication system operation manual carefully.
- Do not touch electric-wiring connections (exposed live parts): this will cause an electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.
- This product does not meet the surge immunity requirements specified in EN61000-4-5 for CE marking. Please provide appropriate protective measures against lightning surges on the device side.
- When the valve power is turned on (i.e., at power-up), the valve lamp may light up momentarily. However, the valve itself is not turned on or off as a result of this.

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MW4G※2-T8G※
Serial Transmission Type
Manual No. SM-295301-A

Jul.5.2002
Revision:Jun.22.2012

1. PRODUCT

1. 1 General outline of the system

1) MW4G※2-T8G※

This solenoid valve system is equipped with a remote I/O station(NW4G※2-T8G※), the CC-Link open field network system. (This is specified by CC-Link Partner Association. :hereafter referred to as CLPA)

The following features are provided.

(1) It helps to curtail wiring man-hours as it requires twist pair cables only to connect it with PLC.
(2) This slave station is an environment-proof slave station applicable to the protection structure IP65 (dust-proof and jet-proof type).
(3) Upper and side wiring directions are provided, ensuring reduction of the installation space.
(4) The power supply for the slave station is separated from that for the valve, ensuring easy maintenance work.
(5) The energized status of the valve power supply can be checked by using the master station through the communication. (Detection function, such as fuse blow-up)
(6) The slave station output status, if the communication error occurs, can be set using the switch (holding or all points OFF).

2) CC-Link

The CC-Link is Open field network system for FA including remote I/O devices (Sensor and valve, etc.) and intelligent devices (high-speed counters, inverters, etc.), can be configured with reduced wire connections. Moreover, the user can create programs that control these devices installed away from the master station without being aware of the communication protocols.

The CC-Link system has following features:

(1) 10Mbps network, the fastest network in the industry, is applicable to a sensor and large capacity data communication requiring the high-speed response.
(2) Remote control handling the bit data and data communication handling word data (analog) can be performed at the same time. The communication is also stable at a high speed.
(3) “n : n” cyclic transmission can be performed between the controllers, ensuring easy distributed control.

Note: Before using this product, thoroughly red the User's Manual.
This document mainly describes MW4G※2-T8G※ and slave station(NW4G※2-T8G※). For details about other units to be connected to the CC-Link, read relevant User's Manual. Before operating this manifold solenoid valve, thoroughly read both this document and above manual to fully understand its functionality and performance.
If the customer has any question about the CC-Link, contact the following home page.

CC-Link Association

Home page address: **http://www.cc-link.org**

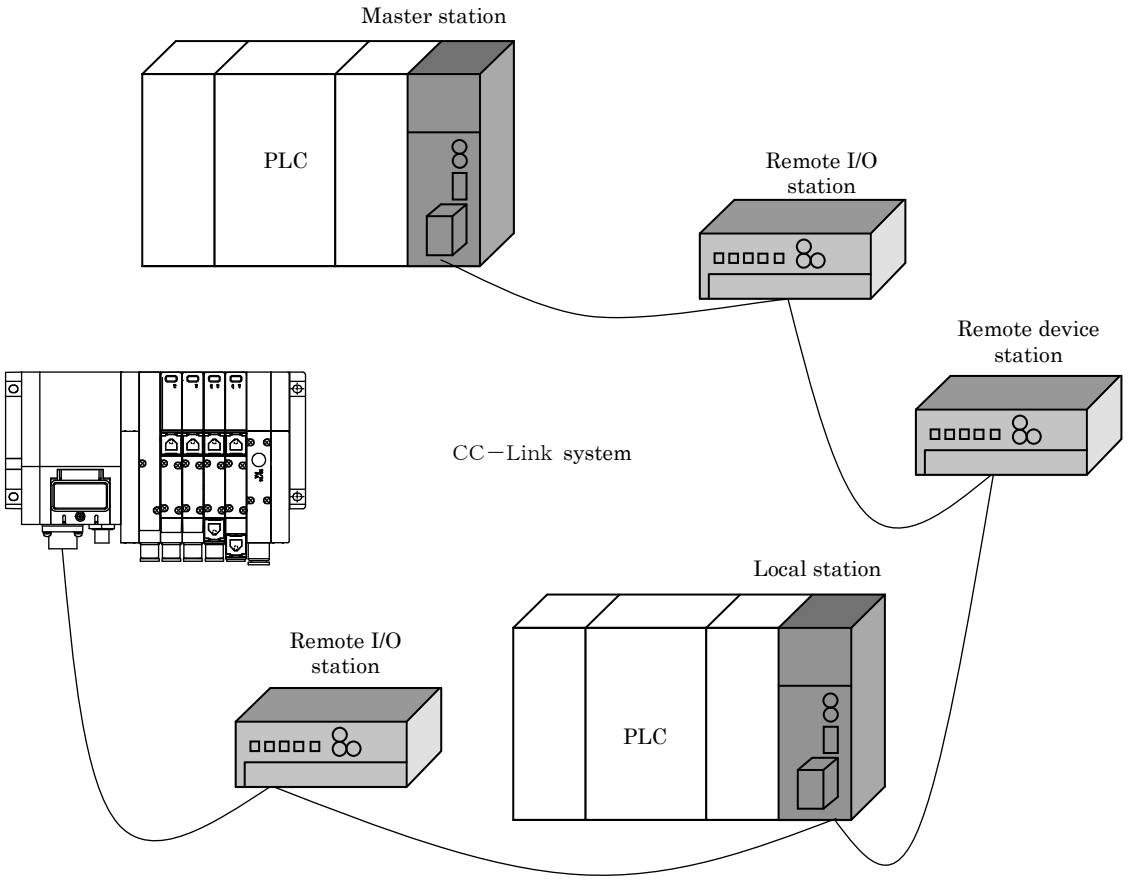
1．2 Structure of the System

This system chiefly consists of PLC body, Master unit, Solenoid valve MW4G※ 2-T8G※ and peripheral equipment.

- Combination of PLC and Master unit

Type of CPU	Type of Master unit
AnN / AnA / AnU series	AJ61BT11
AnS / A2US series	A1SJ61BT11
QnA series	AJ61QBT11
Q2AS series	A1SJ61QBT11
Q series	QJ61BT11
others	Master station applicable to CC-Link

- Fundamental structure of system



Master station Station controlling remote I/O stations, remote device stations, and local stations.

Remote I/O station ····· Remote station that handles ON/OFF data only.

Remote device station ····· Remote station that handles ON/OFF data and numerical data.

Local station ····· Station that has its own CPU and can communicate with the master station and other local stations.

Intelligent device station ····· Station informed by the transient transmission (including the local station).

1．3 Specifications

1) Specification of solenoid valve

(1) Common specifications

Model No. / Item		W4G2
Media		Compressed air
Valve configuration		Pilot operation
Applicable solenoid valve		Soft spool valve
Minimum working pressure MPa	2 positions	0.2
	3 positions	0.2
Maximum working pressure MPa		0.7
Proof pressure MPa		1.05
Ambient temperature ℃		-5～55
Media temperature ℃		5～55
Manual override		Common (standard) for non-locked and locked types
Pilot air exhaust method	Internal pilot	Common exhaust for main and pilot valves
	External pilot	Individual exhaust for main and pilot valves
Lubrication ※1		Not required
Protection rating ※2		Dust proof and jet-proof (IP65)
Vibration/Impact m/s²		49 or less / 249 or less
Atmosphere		Operation in the presence of corrosive gas not allowed

※1 ： If lubrication is required, use turbine oil ISO VG32 ,1st grade.
Excessive lubrication or intermittent lubrication may cause unstable operation.

※2 ： Based on IP65 (IEC60529[IEC529：1989-11]) standard test method. The sealing ability must be checked before starting operation.

Reference The unit of the pressure is MPa. The conversion rate is "1MPa=10.1972kgf/cm²".

(2) Electrical specifications

Model No. / Item	W4G2
Rated voltage V	DC24
The range of rated voltage fluctuation.	±10%
Holding current A	0.025
Power consumption W	0.6
Heat-proof class	B
Surge absorber	Standard device
Indicator	Standard

(3) Specifications by model

Item			ON	OFF
Response time ms	2 positions	Single	22	24
		Double	26	—
	3 positions	ABR connection	25	35

The response time shown in the table is with the supply pressure of 0.5 MPa and no lubrication. It changes depending on the supply pressure and the type of oil in the case of lubrication.

Item	Valve specifications		Change –over position class		P→A/B	A/B→R
Effective sectional area mm^2	Sole unit	W4GB2	2 positions		13	13
			3 positions	CC	11	11
				ABR connection	11	13
				PAB connection	15	11
	Manifold	MW4G2 series	2 positions		11	9 (12)
			3 positions	CC	10	10
				ABR connection	10	9 (12)
				PAB connection	12	10

- Values shown in ( ) are those when the exhaust malfunction prevention valve is not installed.
- These values are obtained when the connecting diameter of the A･B port is φ8 push-in joint.

2) Slave station specifications

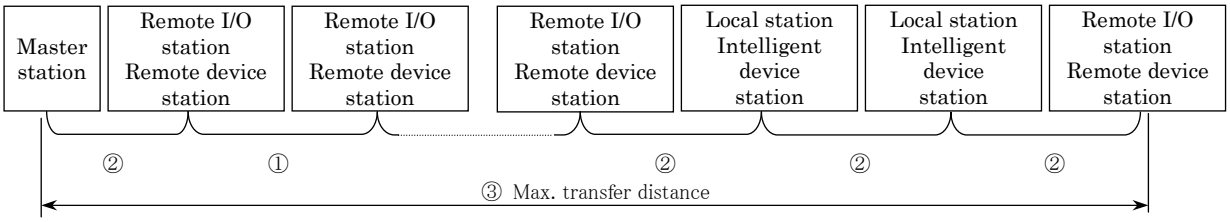
(1) Transmission specifications

Item	Specifications
Transfer rate	156k / 625k / 2.5M / 5M / 10M bps (selectable)
Max. transfer distance(overall cable length)	Depends on transfer rate (※1)
Call processing	Polling
Synchronization	Frame synchronization
Encoding	NRZI
Bus	RS485
Data transfer format	HDLC
Error detection	CRC ($X^{16} + X^{12} + X^5 + 1$)
Cable	Shielded twist pair cable (See 4.1"Wirng".)

※1 "Max. transfer distance"

The following explains the relationships between the transfer rate and the maximum transfer distance:

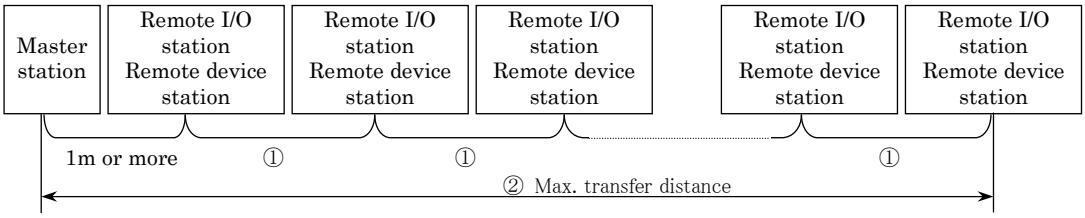
- System Configuration including local station and intelligent device station



B RATE	Transfer rate	Cable exclusively for CC-Link (KURAMO DENKO: FANC-SB, etc.)			High-performance cable exclusively for CC-Link (KURAMO DENKO: FANC-SBH, etc.)		
		①※	②	③	① ※	②	③
4	10Mbps	1.0m or more	2m or more	100m or less	1.0m or more	2m or more	80m or less
		0.6m or more		80m or less	0.7m or more		50m or less
		0.3m or more		50m or less	—	—	—
3	5Mbps	0.6m or more		150m or less	0.6m or more	2m or more	150m or less
		0.3m or more		110m or less	0.3m or more		110m or less
2	2.5Mbps	0.3m or more		200m or less	0.3m or more		200m or less
1	625kbps			600m or less			600m or less
0	156kbps			1200m or less			1200m or less

※ The length shown in Conditions ① above indicates the length of a cable getting between the remote I/O station or remote device station, and the cable length when the master station, local station and intelligent station are connected to either one at least is as shown in Condition.

- System comprising the remote I/O station and remote device station only



B RATE	Transfer rate	No. of total remote	①	Cable exclusively for CC-Link (KURAMO DENKO: FANC-SB, etc.)	High-performance cable exclusively for CC-Link (KURAMO DENKO: FANC-SBH, etc.)
				②	②
4	10Mbps	64 or less	1.0m or more	100m or less	100m or less
			0.7m or more	80m or less	100m or less
			0.6m or more	80m or less	30m or less
			0.4m or more	50m or less	30m or less
			0.3m or more	50m or less	20m or less
		48 or less	0.4m or more	50m or less	100m or less
			0.3m or more	50m or less	80m or less
		32 or less	0.3m or more	50m or less	100m or less
3	5Mbps	64 or less	0.6m or more	150m or less	160m or less
			0.3m or more	110m or less	160m or less
2	2.5Mbps		0.3m or more	200m or less	400m or less
1	625kbps			600m or less	900m or less
0	156kbps			1200m or less	1200m or less

※ 1. Since the transfer distance varies, depending on the transfer rate and communication cables used or the like, refer to the CC-Link User's Manual issued by MITSUBISHI ELECTRIC EQUIPMENT CO, LTD. or check it through the cable manufacturer, etc.

2. Since the number of stations (remote stations) connected differs, depending on the number of occupied stations and conditions of transfer distance or the like, refer to the CC-Link User's Manual issued by MITSUBISHI ELECTRIC EQUIPMENT CO, LTD. or check it through the cable manufacturer, etc.

3. The CC-Link exclusive cable and CC-Link exclusive high-performance cable should not be mixed with each for use.

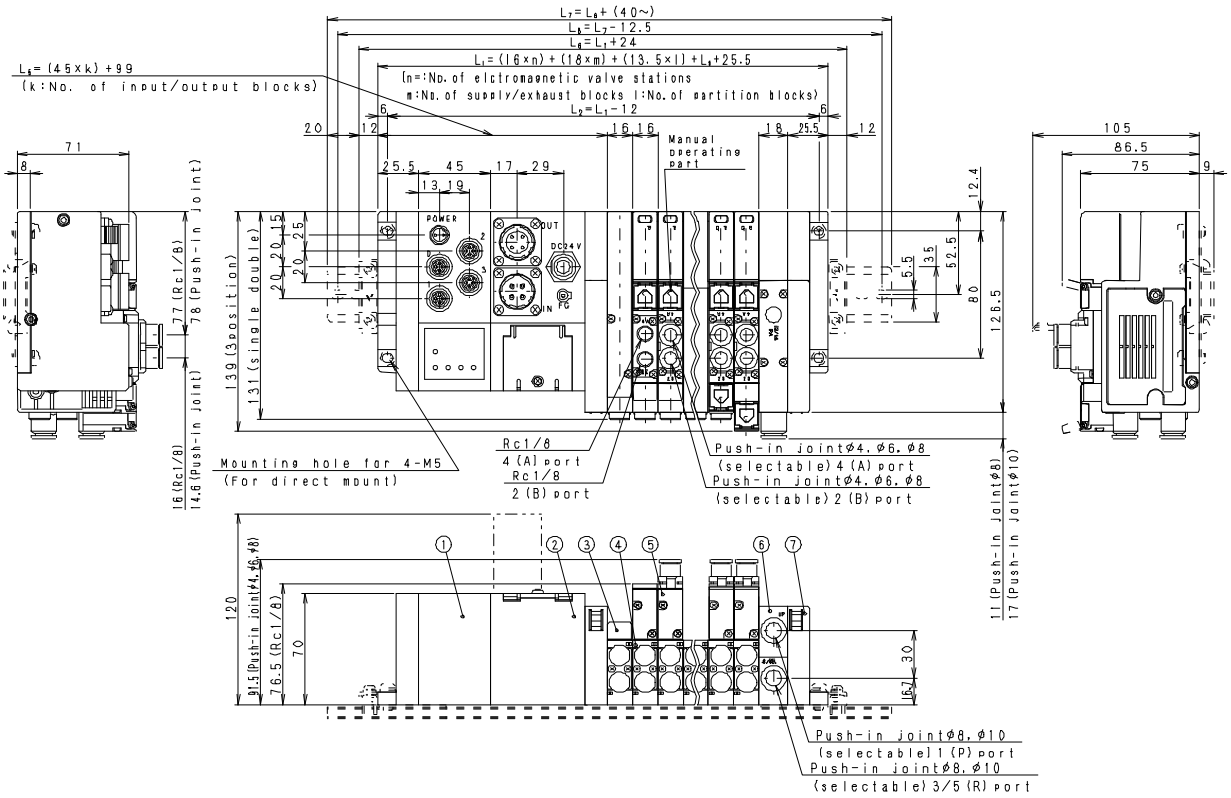
(2) Slave station specification

Item		T8G1	T8G2	T8G7
Power voltage (Unit side)		DC21.6V～26.4V (DC24V ±10%)		
Electric consumption (Unit side)		60mA or lower (While all points are ON.)	100mA or lower (While all points are ON.)	70mA or lower (While all points are ON.)
Power voltage (Valve side)		DC22.8V～26.4V (DC24V +10%, -5%)		
Electric consumption (Valve side)		15mA or lower (While all points are OFF.)		
Insulation resistance		Between all external terminals in a lump and Case 30MΩ or more DC500VM		
Withstanding voltage		Between all external terminals in a lump and Case AC500V for 1minitue		
noise proof		600Vp-p Pulse width 100nsce, 1μsec		
Vibration proof	Durability	10～150～10Hz 1 octave/min. 15 sweeps in the 3 each axis of X, Y and Z while the half amplitude is 0.75mm or 98m/s² whichever smaller.		
	Wrong operation	10～150～10Hz 1 octave/min. 4 sweeps in the 3 each axis of X, Y and Z while the half amplitude is 0.5mm or 68.6m/s² whichever smaller.		
Shock proof		294m/s² 3directions 3 times		
Ambient temperature		-5～55℃		
Ambient humidity		30～85%RH (No dew fall)		
Working environment		No corrosive gas		
Communication object		In conformity with CC-Link Ver1.10.		
Transfer rate		156k/625k/2.5M/5M/10M bps (Selectable)		
No. of input and output points (I/O)		(0/16)	(0/32)	(16/16)
Output insulation type		photo coupler insulation		
Max. load current		40mA/point		
Leak current		0.1mA or lower		
Residual voltage		0.5V or lower		
Output type		NPN transistor open collector output		
Fuse		Power supply for slave stations:24V 1A / Power supply for valve:24V 2A (not replaceable)		
Action indicator		LED (Power supply for slave stations and communication status indicator only)		
No. of monopolized stations		1 station		

1. 4 External dimensions of solenoid valve

1) Upper wiring type

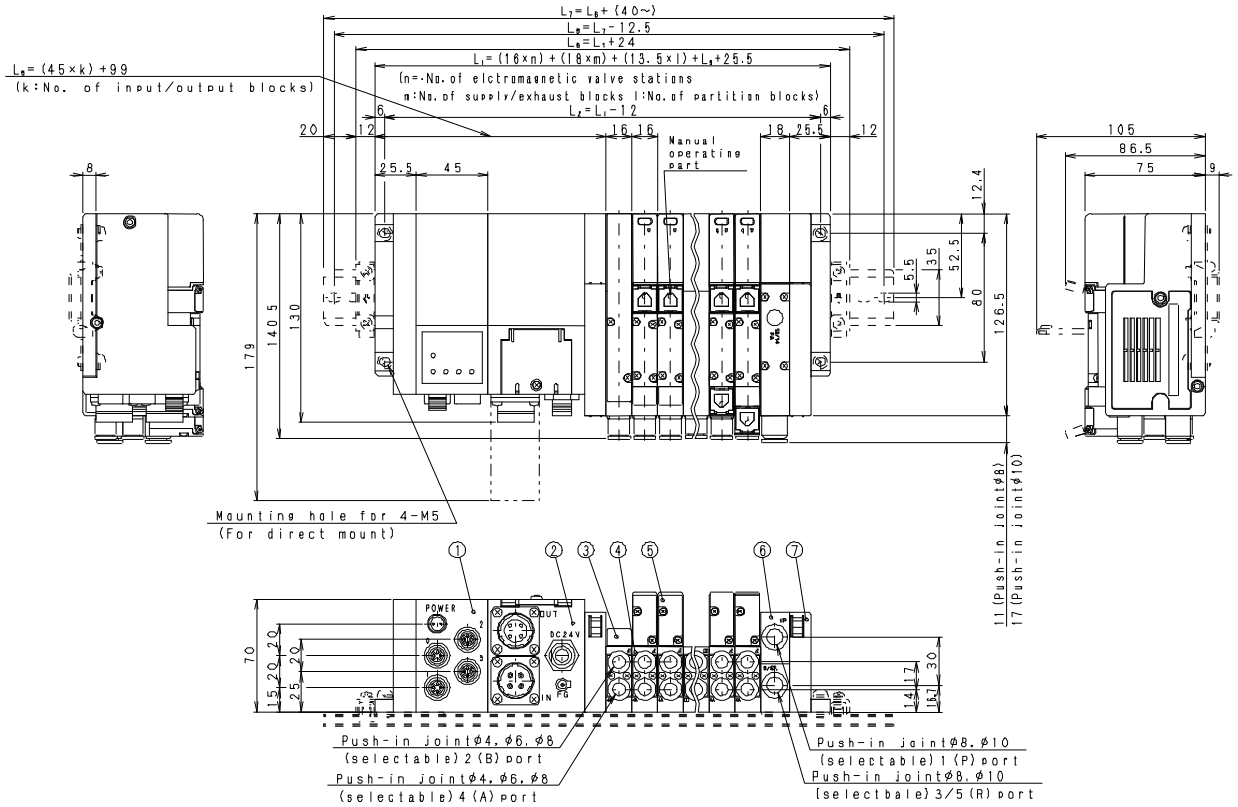
- MW4GA2※0-T8G※



No.	Name of parts
1	Input/Output block
2	Electric component bloockT8G※
3	Masking plate
4	Valve block
5	Solenoid valve main body
6	Supply /exhaust blocks
7	End blocks R

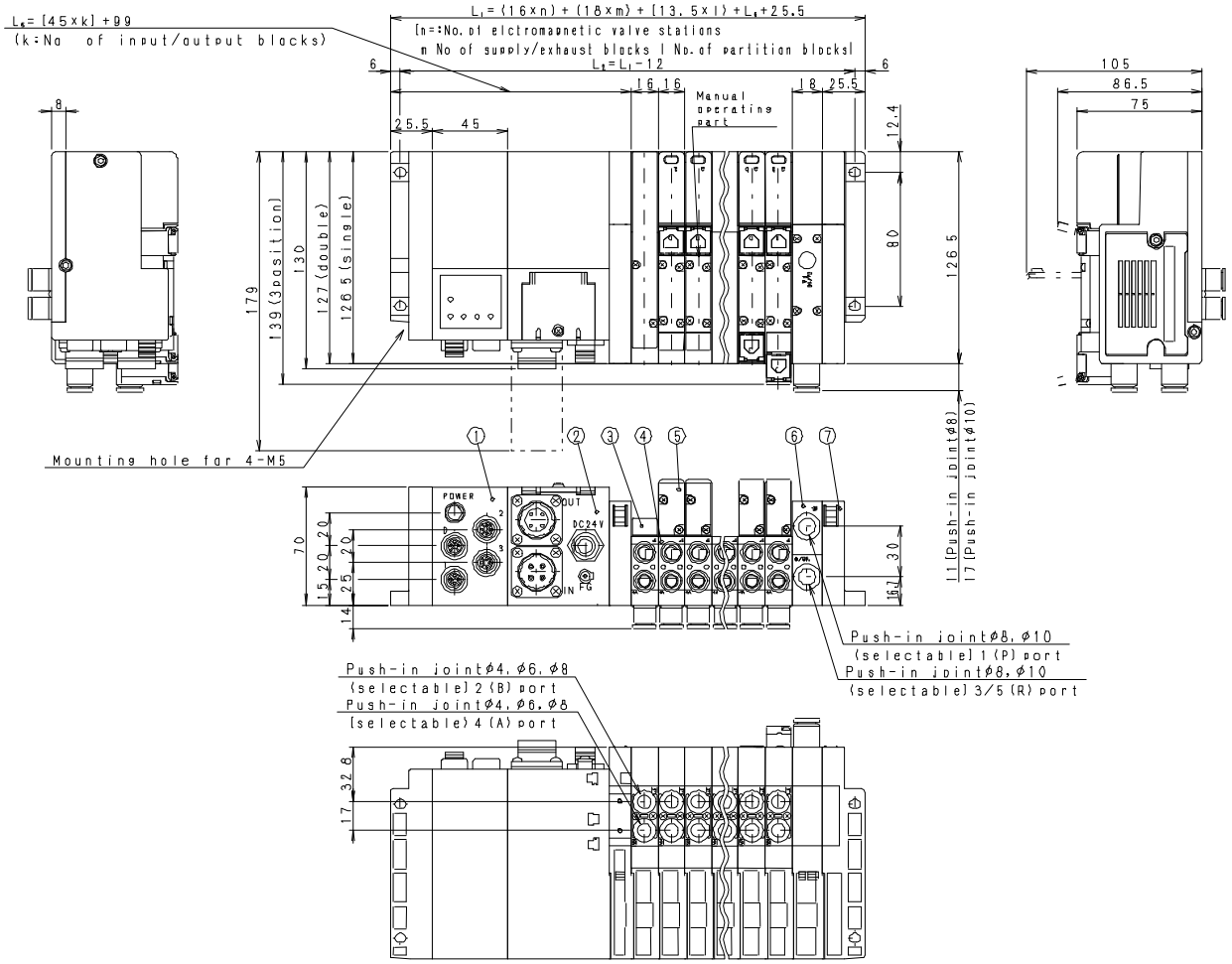
2) Side wiring type

- MW4GB2※0-T8G※



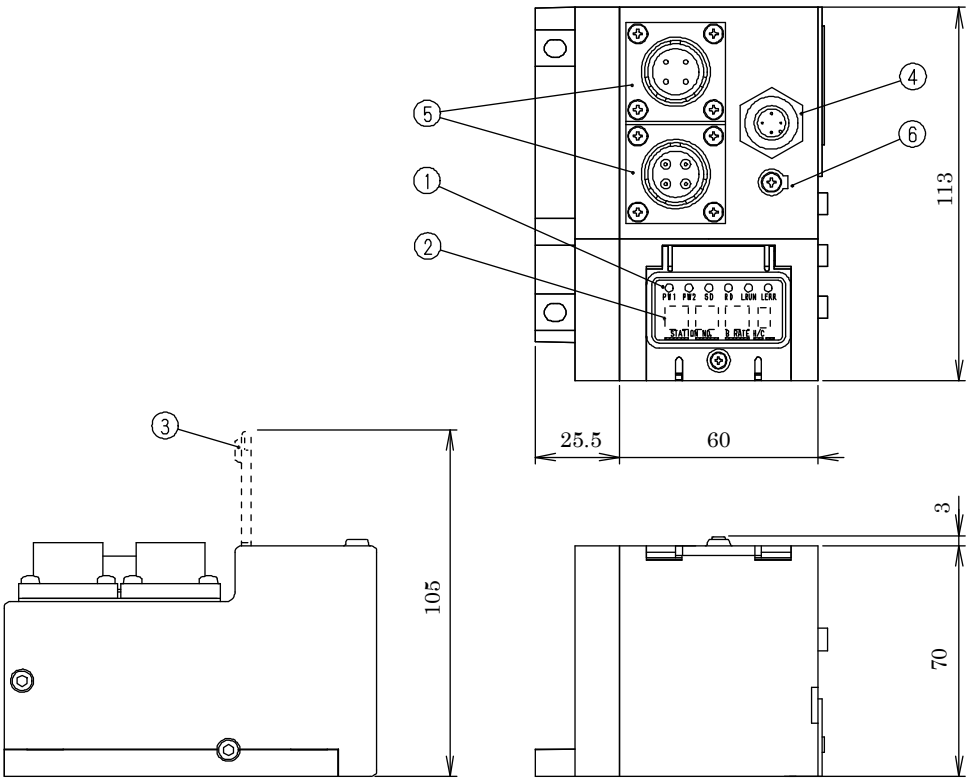
No.	Name of parts
1	Input/output unit
2	Electric componentT8G※
3	Masking plate
4	Valve block
5	Solenoid valve main body
6	Supply /exhaust blocks
7	End blocks R

3) Side wiring type
MW4GZ2※0-T8G※



No.	Name of parts
1	Input/output unit
2	Electric componentT8G※
3	Masking plate
4	Valve block
5	Solenoid valve main body
6	Supply /exhaust blocks
7	End blocks R

1．5 Outside view of valve slave station



① Monitor lamp
The monitor lamp LED indicates the status of the slave station main body and network.

② Setting switches
These switches are used to set a station No., transmission speed, and an output of the slave station when the communication error occurs.

③ Switch cover
This switch cover protects the monitor lamp and setting switches.

④ Power supply connector (M12-connector, male-pin)
The unit power supply and valve power supply are connected to this connector.

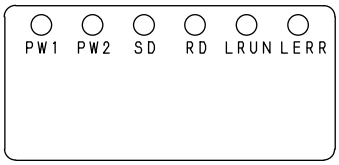
⑤ Communication connector
The communication cable of the network is connected to this connector.

⑥ FG terminal (M3)
The grounding work is carried out from this terminal.

1．6 Indicators and switches on Slave station

1) Monitor lamp

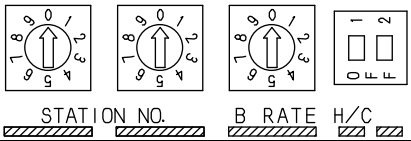
Various LED lamps are installed in front of station to aid visual verification of operational conditions. Each function is printed on the sheet made of resin. Make use of them during maintenance works or for verification of operation.



Name of LED	Content of indication
PW1	Lit when unit power is ON.
PW2	Lit when valve power is ON.
SD	Blinks while Data being output.
RD	Blinks while Data being input.
L RUN	This checks whether or not the slave station correctly exchanges the data with the master station. Lit when data is received normally from the master station. Goes off when data is absent for a preset period of time.
L ERR	Lit when a transmission error (CRC error) is detected. Goes off after a preset period of time. (The RUN lamp is also off.) Lit when the user specifies a value out of range when setting the station number or transfer rate. (When the setting is corrected and the power is turned ON again, the lamp will go off.) Blinks when the station number or transfer rate setting is modified during operation. (The RUN lamp is lit. The slave station starts operation with the station No. setting and transmission speed setting made when the power is turned ON.)

2) Setting switch

This switch is used to set a station No. allocated to the slave station and a transmission speed.



Name of switch	Content of setting
Station number setting	Sets the slave station numbers within the bounds of 01-64.
Transfer rate setting	Sets the transfer rate between the master and slave stations. A value ranging from 0 to 4 is set.
Setting of output status in case of an error	Specify whether to hold (HDL) or clear (CLR) the output when an error occurs.

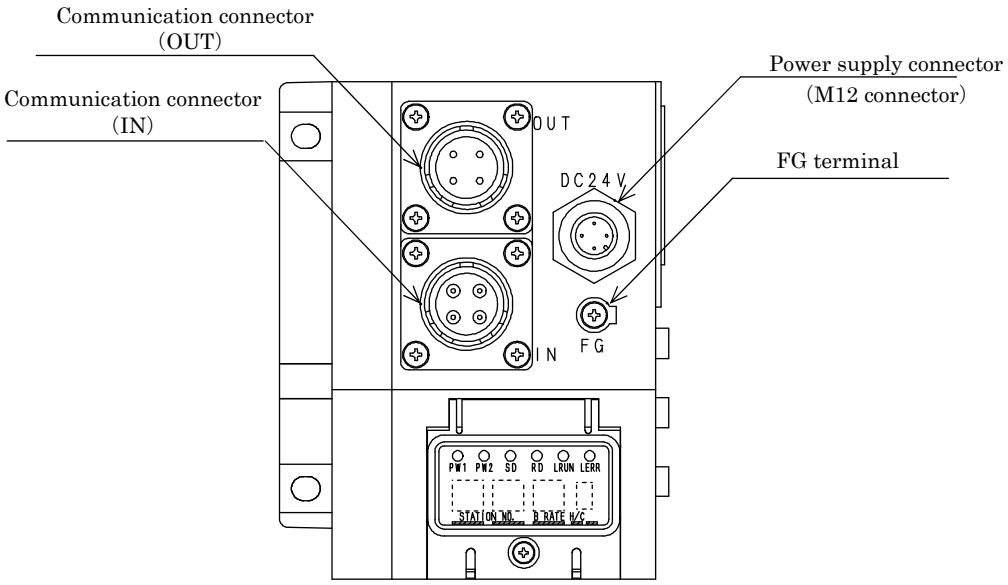
⚠ CAUTION:

- Before changing the switch positions, be sure to cut the power.
- Tighten the switch cover screw with a specified tightening torque (0.3 to 0.4N·m). If the screw is tightened insufficiently, the protection structure may not be kept.
- Keep the cover closed except when you have to change switch positions or reconnect wires. If you keep the cover open unnecessarily, foreign matter may enter the circuit board causing an unexpected failure, or the cover may be broken by accidental contact. While the cover is open as you change switch positions or reconnect wires, be careful not to cause the entry of foreign matter.
- Setting switch has been precisely built. Disorderly handling may cause damage of switch. To set

station number, never touch internal circuit printed board.

1．7 connection connector

The wiring of this slave station is performed using the water-proof connector as shown in the Fig.



Symbol	Function	Objects to be connected
IN / OUT	Communication connector	Connect to the master station, other remote I･O station, and communication terminals (DA･DB･DG･SLD) of the remote device station.
DC24V	Power connector	The power connector is connected to the unit power supply and valve power supply. Unit power : DC24V±10% Valve power : DC24V+10 / -5%
FG	Ground terminal	The 3rd grade or higher grounding work specially designed for the sequencer shall be performed.※1

※1: SLD and FG terminals are connected inside the slave station unit.

⚠ CAUTION:

- Touching the electrical wiring connection part (bare live part) may cause an electric shock. Before starting the wiring work, always shut-down the power completely. Additionally, do not touch any electrically live part by wet hand.
- Pay special attention so that any tensile force or impact is not applied to the power cable and communication cable. Additionally, if the wiring distance is long, unexpected force due to own weight or shock may be applied, causing the unit to break. Therefore, to prevent such troubles, take appropriate measures, such as securing of the wires and cables to the machine.

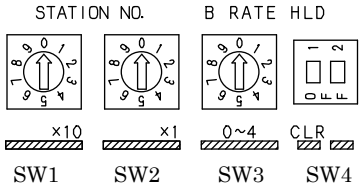
2. CAUTION

- Refer to User's manual for the master station concerning to transmission delay time. The transmission delay within the entire system depends on the scan time achieved by the PLC unit and on other devices included in the network.
- Solenoid valve responding time, of course, varies depending on model.
  It is advisable of referring to valve specification.
- As for OFF time, there is another delay factor of approx. 20ms due to flywheel diode being used for surge absorbing circuit to valve slave station.
- Connect the power supply cable and signal cable correctly within the specifications so that any incorrect wiring is not performed.
- Pay special attention so that any tensile force or impact is not applied to the power supply cable and signal cable.
- Before turning ON the power, make sure that the various connection cables and connectors are connected firmly.
- Disassembly, modification, and/or repair made by the customer may cause a trouble or malfunction. Never attempt to disassembly, modify, and/or repair the unit.
- Many precision devices are mounted inside the unit. Do not drop the unit or apply vibration or impact to the unit.
- If any connector is disconnected or connected with the electric power supplied, this may cause a trouble or malfunction. Do not disconnect or connect any connector with the electric power supplied.

3. OPERATION

3. 1 Switch setting

The switches are used for different kinds of setup: setting the station number, setting the transfer rate, specifying whether to hold or clear the output during an error. Since different switches are used for different kinds of setup, you must correctly identify the switch to be used. Before changing the switch positions, be sure to cut the power.

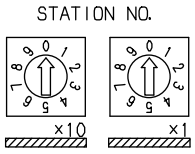


⚠ CAUTION:

- Before changing the switch positions, be sure to cut the power.
- Tighten the switch cover screw with a specified tightening torque (0.3 to 0.4N·m). If the screw is tightened insufficiently, the protection structure may not be kept.
- Keep the cover closed except when you have to change switch positions or reconnect wires. If you keep the cover open unnecessarily, foreign matter may enter the circuit board causing an unexpected failure, or the cover may be broken by accidental contact. While the cover is open as you change switch positions or reconnect wires, be careful not to cause the entry of foreign matter.
- Setting switch has been precisely built. Disorderly handling may cause damage of switch. To set station number, never touch internal circuit printed board.

1) Station number setting (SW1, 2)

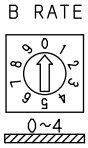
Assign a station number to the slave station using a number between 01 and 64.



- Use the "×10" switch to specify the 10 column digit in the station number.
- Use the "×1" switch to specify the 1 column digit in the station number.

2) Transfer rate setting (SW3)

Set the transfer rate for communication between the master and slave stations.



Setting	Transfer rate
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

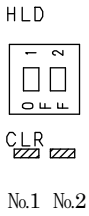
Can't use the same station No.

⚠ CAUTION:

- The transfer rate should be set in the same manner as with all master stations, local stations and remote stations on the network. If this setting differs even in one station, no normal data link is possible.

3) Other setups (SW4)

The output status (holding or clear) if the communication error occurs is set.



No.	Function	Position	
		CLR	HLD
No.1	Specifies whether to hold or clear the output when an error (bus line error, time over, etc.) occurs.	Clear	Hold

3. 2 Correspondence between slave station input/output No. and PLC address No.

1) PLC address correspondence table

This table shows the correspondence assuming that the serial transmission slave station is set at station No.1.

Exclusive output type

Buffer memory address of the master station

	160H																161H															
	RY 00	RY 01	RY 02	RY 03	RY 04	RY 05	RY 06	RY 07	RY 08	RY 09	RY 0A	RY 0B	RY 0C	RY 0D	RY 0E	RY 0F	RY 10	RY 11	RY 12	RY 13	RY 14	RY 15	RY 16	RY 17	RY 18	RY 19	RY 1A	RY 1B	RY 1C	RY 1D	RY 1E	RY 1F
Type of slave station	Input block	Output block	Serial-transmission slave station I/O No.																													
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
T8G1 (16points output)	—	—																														
		1 unit	s1	s2	s3	s4	s5	s6	7	s8	s9	s10	s11	s12	1-0	1-1	1-2	1-3														
		2 unit									1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3														
T8G2 (32points output)	—	—																														
		1 unit	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	1-0	1-1	1-2	1-3
		2 unit																									1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3
		3 unit																					1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3	3-0	3-1	3-2	3-3
		4 unit																	1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3	3-0	3-1	3-2	3-3	4-0	4-1	4-2	4-3

Example 1

Example 2

Input/output mixed type

Buffer memory address of the master station

	E0H																161H															
	RX 00	RX 01	RX 02	RX 03	RX 04	RX 05	RX 06	RX 07	RX 08	RX 09	RX 0A	RX 0B	RX 0C	RX 0D	RX 0E	RX 0F	RY 10	RY 11	RY 12	RY 13	RY 14	RY 15	RY 16	RY 17	RY 18	RY 19	RY 1A	RY 1B	RY 1C	RY 1D	RY 1E	RY 1F
Type of slave station	Input block	Output block	Serial-transmission slave station I/O No.																													
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
T8G7 (16 points input / 16 point output)	1unit	—																														
		1 unit	1-0	1-1	1-2	1-3													s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
		2 unit																													2-0	2-1	2-2	2-3
	2 unit	—																														
		1 unit	1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3									s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
		2 unit																													3-0	3-1	3-2	3-3
	3Unit	—																														
		1 unit	1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3	3-0	3-1	3-2	3-3					s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
		2 unit																													4-0	4-1	4-2	4-3
	4 unite	—																														
		1 unit	1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3	3-0	3-1	3-2	3-3	4-0	4-1	4-2	4-3	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
		2 unit																													5-0	5-1	5-2	5-3

Example 3

※A numeric value in the field of the input/output block shows the number of stations(connector No.) counted from the serial transmission slave station.

※One field by bold lines shows one input/output block.

: input block : output block : solenoid output

How to read the table

① Check the type of the serial transmission slave station to be used and the connection style of the input/output block.

② Read out the PLC address corresponding to each input/output point of the unit on the table.

(Example 1) ＜Style＞ Serial-transmission slave station：T8G1、Output block：0 unit

《Output point》 11th solenoid output ⇒ 《Address》 Buffer memory 160H（Remote output No.RY0A）

(Example 2) ＜Style＞ Serial-transmission slave station：T8G2、Output block：3 units

《Output point》 No.1 of 2nd output block station ⇒ 《Address》 Buffer memory 161H（Remote output No.RY19）

(Example 3) ＜Style＞ Serial-transmission slave station：T8G7、Input block：2 units、Output block：2 units

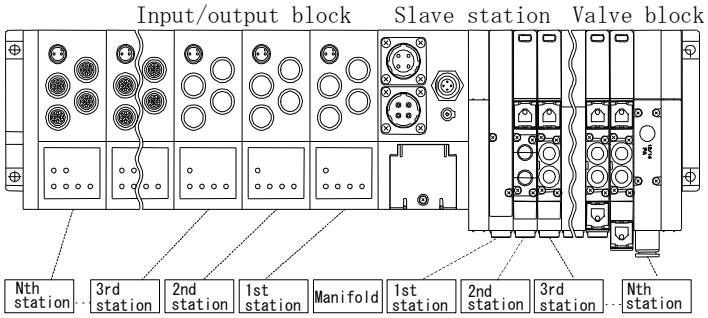
《Input point》 No.2 of 2nd input block station ⇒ 《Address》 Buffer memory E0H （Remote input No.RX06）

《Output point》 No.3 of 3rd output block station ⇒ 《Address》 Buffer memory 161H（Remote output No.RY1B）

How to count the number of manifold stations.

・The solenoid valve manifold station No. is set sequentially from the left with the piping port put on the front regardless of the wiring block position.

・The manifold station No. of the optional input/output block(NW4G※ 2-IN/OUT) is set sequentially from the slave station side. When the input block and output block are mixed, the manifold station No. is set after the input blocks have been arranged first.



2) Valve No. assignments corresponding to T8G※ solenoid output No. (Example)

※ The numbers in valve No. 1a, 2a, 2b… indicate the station No.1 station No.2 and so on, while the alphabets (a) and (b) mean, respectively the solenoid on the side (a) and the solenoid on the side (b). The maximum number of stations on the manifold differs among the models. Refer to the specifications of the model you selected.

<Standard wiring>

● For single solenoid valve（Corresponds with up to the 16th manifold block.）

Solenoid output No	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a																

● For double solenoid valve

Solenoid output No	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b	13a	13b	14a	14b	15a	15b	16a	16b

● For mixed installation of single and double solenoid valve stations

Solenoid output No	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No	1a	2a	3a	3b	4a	4b	5a	6a	7a	7b	8a	9a	10a	10b	11a	11b	12a	13a	14a	14b	15a	15b	16a									

<Double wiring>

● For single solenoid valve

Solenoid output No	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No	1a	※1	2a	※1	3a	※1	4a	※1	5a	※1	6a	※1	7a	※1	8a	※1	9a	※1	10a	※1	11a	※1	12a	※1	13a	※1	14a	※1	15a	※1	16a	※1

● For double solenoid valve

Solenoid output No	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b	13a	13b	14a	14b	15a	15b	16a	16b

● For mixed installation of single and double solenoid valve stations

Solenoid output No	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No	1a	※1	2a	※1	3a	3b	4a	4b	5a	※1	6a	※1	7a	7b	8a	※1	9a	※1	10a	※1	11a	11b	12a	12b	13a	13b	14a	14b	15a	15b	16a	※1

※1 ： Not used

3. 3 Programming

This slave station unit is seen as a 16-point output unit…T8G1, 32-points output unit …T8G2, 16-points input/16-points output unit …T8G7constituting a remote I/O station. (The unit monopolizes the position of a single station.) When creating programs, refer to the Mitsubishi User's Manual (CC-Link system master/local units).

This slave station provides the special functions, setting of the output status if an error occurs and setting of the end station. However, both settings do not relate to the program. Additionally, this slave station also has a function that informs the fuse blow-up status of the valve power supply to the master station. By checking relevant bit of the following register (this bit No. may vary depending on the station No.), the fuse blow-up or ON/OFF status of the valve power supply can be understood.

<table>
<tr><th>Link special registers</th><th>Name</th><th>Contents</th></tr>
<tr><td>SW0088
(688H)
・
SW0089
(689H)
・
SW008A
(68AH)
・
SW008B
(68BH)</td><td>Fuse blow-up status of other station</td><td>Fuse blow-up status of each station is stored.
0 : Correct
1 : Fuse blow-up occurs.
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>～</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>～</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>～</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>～</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>～</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
1 to 64 in the table shows station No.</td></tr>
</table>

※ When the master station is AJ61BT11 and A1SJ61BT1 models.

4. INSTALLATION

4. 1 Installation

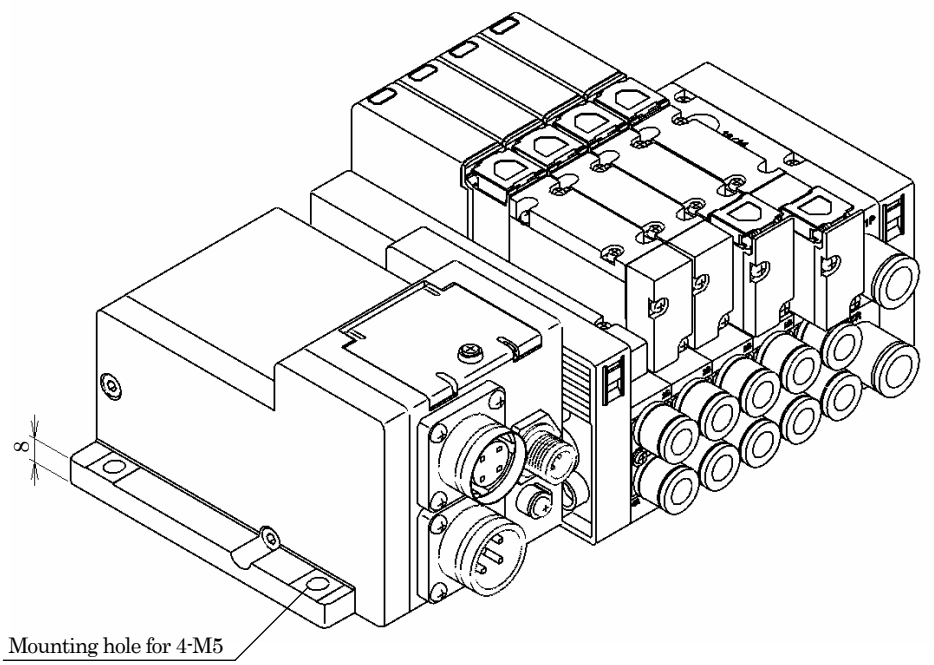
> **⚠ WARNING :** When installing a solenoid valve unit, never attempt to hold it in position by means of the pipes connected to it.
>
> - Mount the solenoid valve by applying the mounting screws and/or mounting plate to the solenoid valve.

> **⚠ CAUTION :** If you choose to mount the solenoid valve manifold on a DIN rail, make sure that the DIN rail is strong enough.

4.1.1 Please secure an enough space around the solenoid valve for mounting, dismounting and piping work.

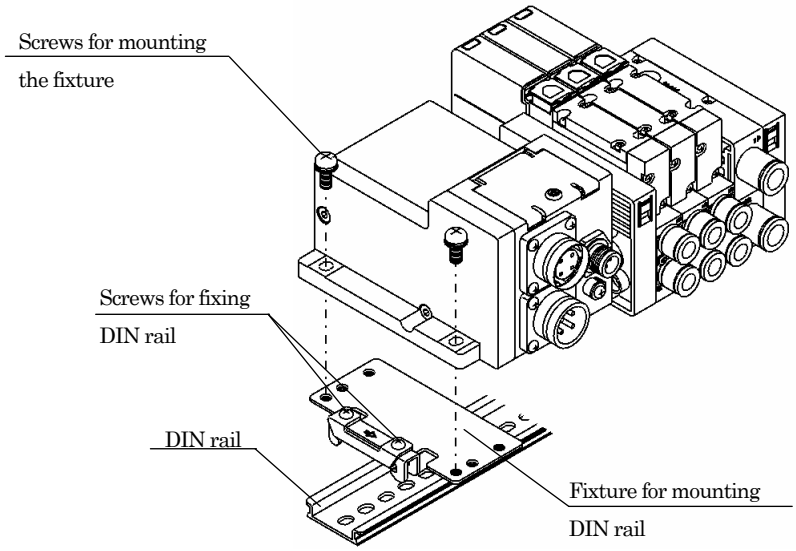
4.1.2 In case of installing directly

Mount the master station on the mounting hole by using the screw. (M5 screw, appropriate tightening torque: 1.2N･m)For the mounting hole pitch, see section 1.4, Outside dimensions of solenoid valve.(P10～12)



4.1.3 In case of installing by means of DIN rail

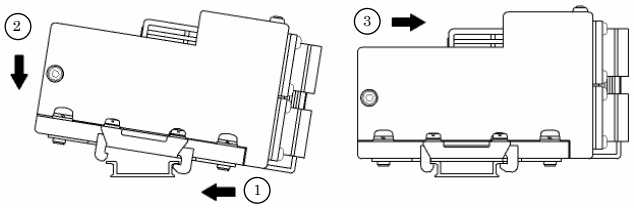
For W4G2 Series, you can change the manifold of direct mounting type to DIN rail mounting type. If not counted properly, dropping down of the manifold or damage to it may be caused, to which please pay your careful attention. In addition, in case of the gross weight of manifold exceeding 1.0kg or it is installed in an environment where vibration or shock occurs, fix DIN rail to the mounting face with a distance of 50 – 100mm. Make sure that the installation has been carried out completely and then start using. There is no restriction to the mounting direction or mounting posture, but the mounting screws may become loose due to resonance with any vibration which may cause the manifold to drop down. Please pay your careful attention to this point when operating.



●How to mount DIN rail

1. Fit the fixtures for mounting DIN rail (Tightening torque: 1.8 – 2.3N・m)
2. Hook the jaws on DIN rail in the order of ① and ②.
3. Push toward ③ direction.
4. Tighten the screws for fixing DIN rail.

(Tightening torque: 1.2 – 1.6N・m)



4. 2 Wiring

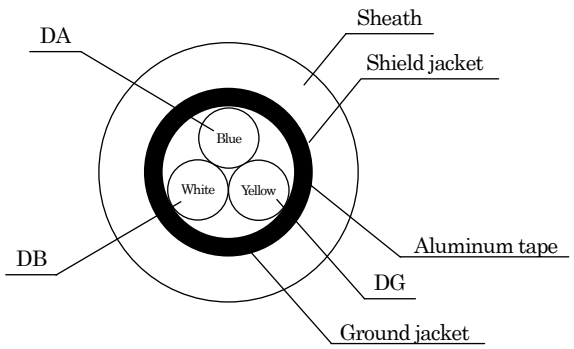
It is required to connect signal circuit with power line to make this model MW4G※ 2-T8G※ function. Erroneous connection cases not only malfunction but in some cases, vital transmission damage to this station including other related devices. Read and understand the content of each User's manual for Sequencer and CC-Link system, product of Mitsubishi Denki Co., Ltd ., as well as reading this manual to accomplish correct wiring.

⚠ CAUTION:

- Touching the electrical wiring connection part (bare live part) may cause an electric shock. Before starting the wiring work, always shut-down the power completely. Additionally, do not touch any electrically live part by wet hand.
- Pay special attention so that any tensile force or impact is not applied to the power cable and communication cable. Additionally, if the wiring distance is long, unexpected force due to own weight or shock may be applied, causing the unit to break. Therefore, to prevent such troubles, take appropriate measures, such as securing of the wires and cables to the machine.

1) Specifications of (twist pair cable) communication line.

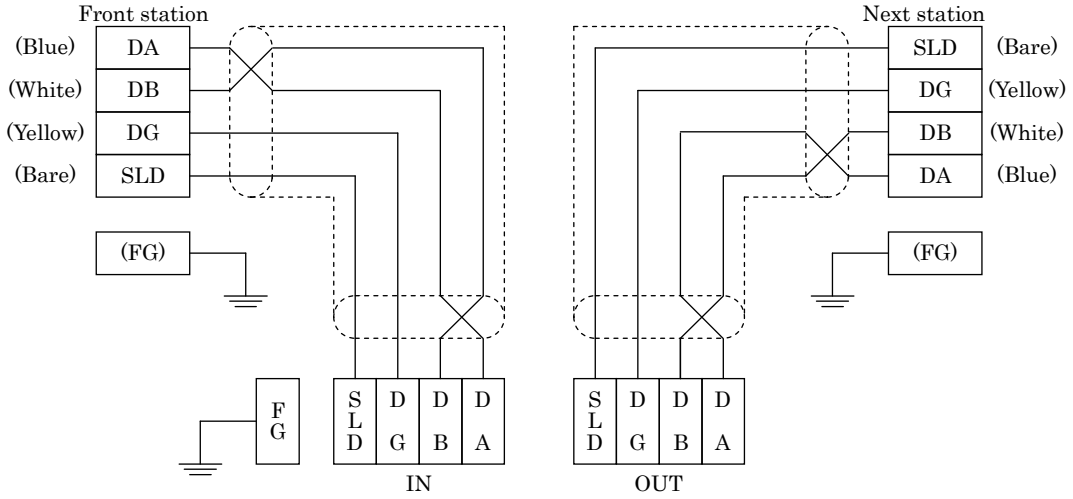
The table below illustrates the communication line recommended for use in the CC-Link system. The quality of data transfer in the CC-Link system is guaranteed only if you use the recommended cable. Note the name and specifications of the recommended cable in the table below.

Item	Specifications	
	Cable exclusively for CC-Link	High-performance cable exclusively for CC-Link
Name	FANC-SB	FANC-SBH
manufacturer	Kuramo Denko Co., Ltd.	
Kind of cable	Twist pair cable with shield	
Conduit sectional area	0.5mm²	
Conduit resistance (20℃)	37.8Ω / km or less	
Insulation resistance	10000MΩ-km or more	
Withstanding voltage	DC500V 1 minute	
Capacity of static electricity (1kHz)	60nF / km or less	40nF / km or less
Impedance characteristic (1MHz)	100±15Ω	130±15Ω
Sectional view		
External dimension	7mm	8mm
Approximate	65kg/km	60kg/km

Note: A CC-Link special cable other than that described in the above table can also be used. However, the transfer distance may vary depending on the type of cable. To use such cable, refer to the User's Manual for CC-Link ore contact the cable manufacturer.

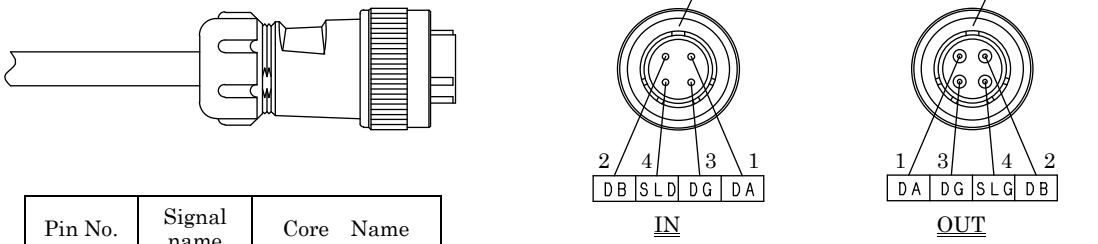
2) Wiring of Communication Line.

When connecting the communication cable to this slave station, solder the DA (blue), DB (white), DG (yellow), and shield (SLD) lines to relevant terminals of the water-proof connector. Additionally, perform the 3rd grade or higher construction work on the FG terminal.



Slave unite

The pin shape of the IN water-proof connector is different from that of the OUT water-proof connector. Connect the communication cable to each water-proof connector as shown in the Fig. below.



Pin No.	Signal name	Core Name
1	DA	Blue
2	DB	White
3	DG	Yellow
4	SLD	Twist cable with shield

<Recommended Connector>

・ IN connector

FA-204-PF8 (4-core female plug) Mitsubishi Electric Engineering Corp.

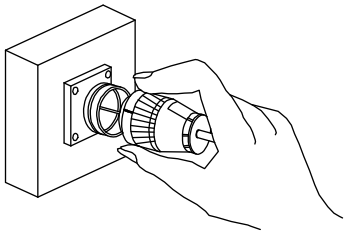
・ OUT connector

FA-204-PM8 (4-core male plug) Mitsubishi Electric Engineering Corp.

3) Insertion and removal of water-proof connector

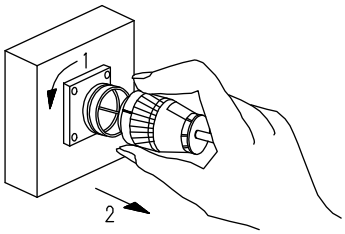
(1) Attach

Make the plug matched with the receptacle guide and push it straight. (Since 5-key method is used, make the plug in contact with the receptacle and turn the plug to make the plug matched with the guide.)



(2) Removal

Turn the coupling nut 45° in the direction indicated by a arrow and pull it out.



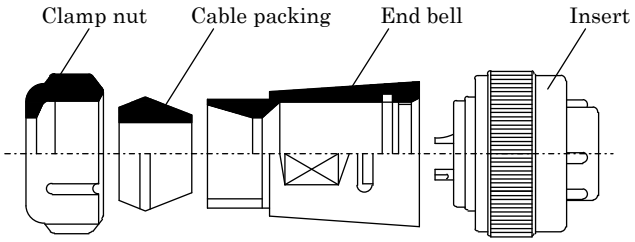
4) Water-proof connector connection work.

The following describes how to connect the water-proof connector and cable.

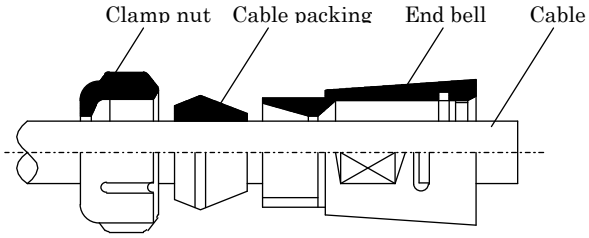
(1) Follow the steps below to disassemble the connector.

① Turn the inset assembly counterclockwise to remove it from the end bell.

② Loosen the clamp nut to remove the cable packing from the end bell.



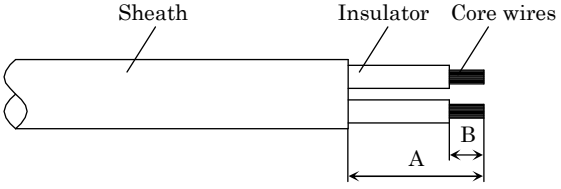
(2) Pass each disassembled part through the cable in order shown in the Fig. below. Carefully check the order and orientation of each part.



(3) Cut the sheath and insulator of each cable by the following size and remove them.

[Shell size 20]

A size	B size	Cross-sectional area of the conductor (mm²)
18	5.2	1.25 or less

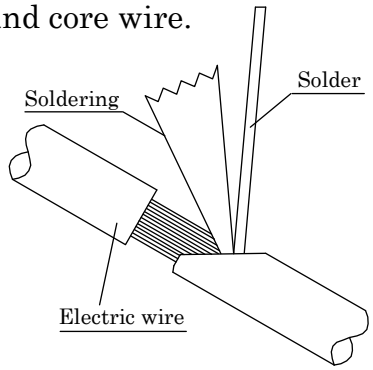


(4) Pre-solder the core wires of the cable with the wire ends processed. Do not pre-solder core wires until the sheath part of the cable. Carefully perform the pre-soldering so that the finish status is smaller than the diameter of the contact hole and the core wires are soldered evenly.

(5) Soldering

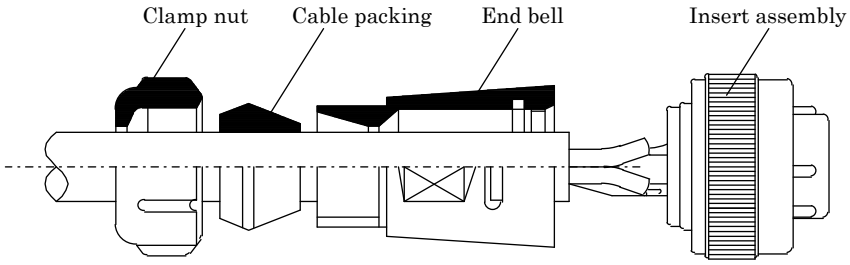
① Insert the pre-soldered core wires into the solder pot of the contact.
② Heat up the contact and core wires with the soldering iron.
③ Flow the solder to fill the gap between the contact and core wire.

Soldering iron to be used	Cross-sectional area of the conductor (mm^2)	Temperature of soldering iron tip (℃)
30W	0.5	280
60W	1.25	350



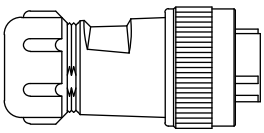
(6) Follow the steps below to assemble the connector.

① Secure the insert assembly and tighten the end bell with a tightening torque of 0.98N･m to 1.47N･m.
② Push the cable packing inside the end bell to secure the end bell and tighten the clamp nut with a tightening torque of 1.47N･m to 1.96N･m.
③ Move the cable in the back and forth, and horizontal directions, and then tighten again with a specified tightening torque.



5) Connection of termination connector

If this slave station is connected at the farthest position from the master station, the termination process is required. Connect the termination connector shown in the Fig. Below to the OUT side (female pin). When using the CC-Link special cable {CC-Link special high-performance cable (Kuramo Denko's FANC-SBH), etc.} change the termination resistor inside this connector to that suitable for the connection conditions (specifications).



Name Termination connector (For 4-core、110Ω)
Model name FA-CONW4P110E
Manufacturer name Mitsubishi Electric Engineering Corp.

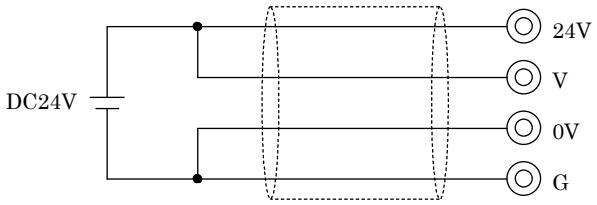
⚠ CAUTION:

- For the signal line, be sure to use the cable conforming to the CC-Link specification.
- Always use a proper cable suitable for applicable cable packing diameter of the water-proof connector. For details, see the product catalog made by Mitsubishi Electric Engineering Corp.
- Run the communication cable far from the power cable and high-voltage cable.
- When changing the termination resistor to 130Ω-resistor, perform the insulation process so that the lead wires of the resistor are not in contact with other part.
- Keep a sufficient bending radius of the communication cable and do not bend the communication cable forcibly.

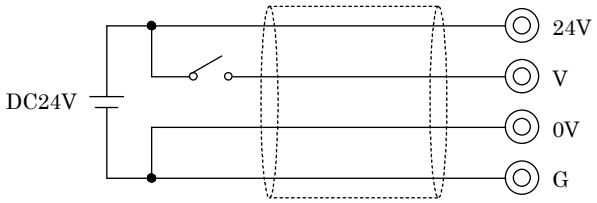
6) Power line wiring

In NW4G※2-T8G※, the unit power supply is separated from the valve power supply. Additionally, each power supply is connected by using the sensor connector (M12). The following shows examples of each power supply connections.

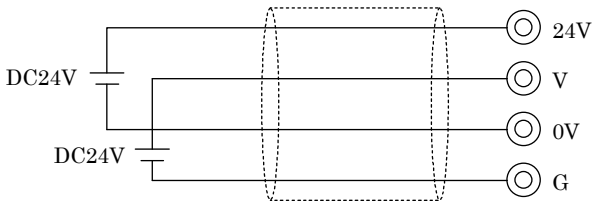
(1) When the common power supply is used for the unit power supply and valve power supply:



(2) When only the valve power supply is turned ON or OFF:

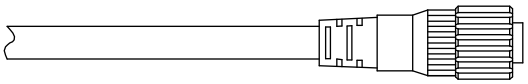


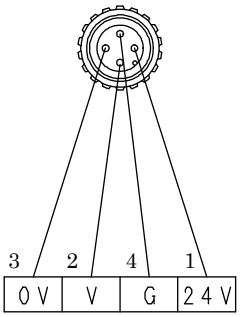
(3) When the unit power supply is separated from the valve power supply:



Power cable (4-pole for DC)
Follow the steps below to connect the power cable to this product.

① After checking the safety, turn OFF the power supply to be connected to the slave station.
② Check the following pin assignments and connect the slave station power supply and valve power supply to the power cable.
③ Connect the connector to the power connector on the slave station, and then tighten it.





Pin No.	Signal name	Remarks
1	24V	Positive(+) side of unit power supply
2	V	Positive(+) side of valve power supply
3	0V	Positive(-) side of unit power supply
4	G	Positive(-) side of valve power supply

<Recommended connectors>
Connector with cable
・ Model XS2F-D421-＊ (one-side connector socket)
Assembly type connector
・ Model XS2C-D4C＊ (crimping type)
・ Model XS2C-D42＊ (soldering type)
・ Model XS2C-D4S＊ (screw wiring type)
Manufacturer: Omron Corp.

⚠ CAUTION:

- Always tighten the connector firmly by hand. (Appropriate tightening torque: 0.4 to 0.5N･m)
- After checking the polarities and rated voltage carefully, perform the connections.
- Select a power cable after calculating the current consumption.
- When designing the system to supply power to duplex number of slave stations and remote I/O stations, choose and wire the source of power cord with a consideration of voltage drop.
- Secure ample voltage within rating by providing dual wiring, if necessary, to keep as small voltage loss of single system as possible or installing source of power near-by solenoid.
- To avoid any problems due to noise, observe the following when wiring:

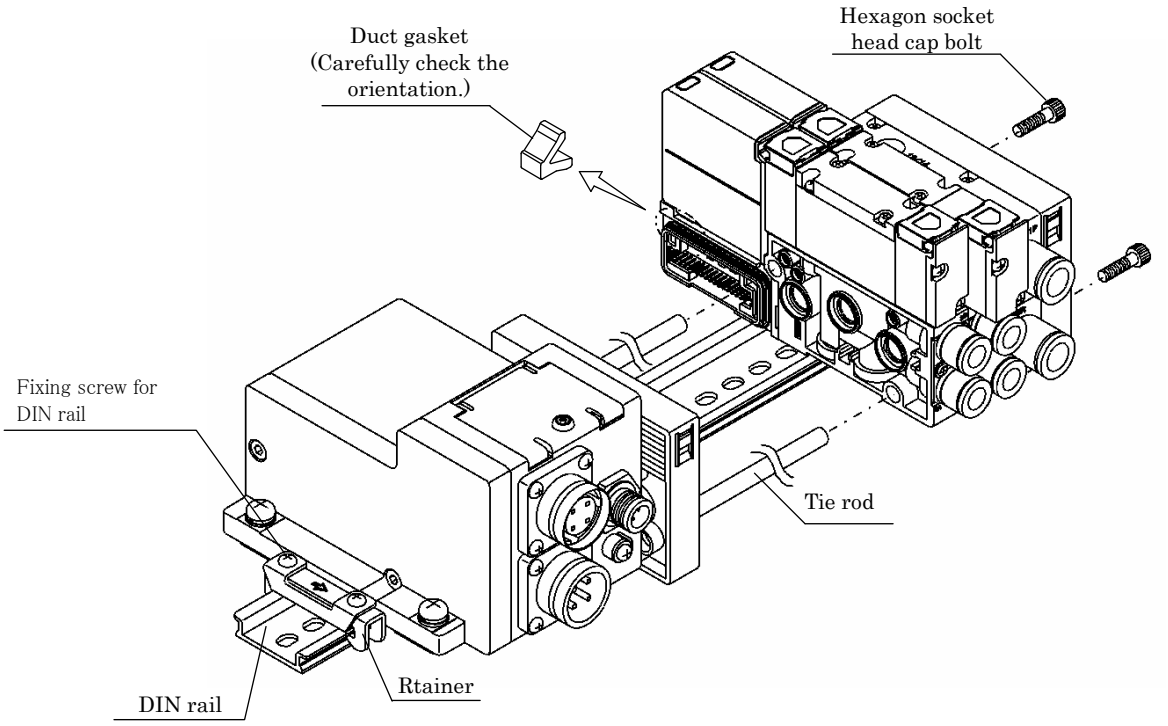
① If it is predicted that the noise may affect, provide a power source for every manifold solenoid valve wherever possible, and provide wiring individually.
② Minimize the wiring distance whenever possible.
③ Do not share a common power source with equipment such as an inverter or motor, etc. which can be a possible source of noise.
④ Do not wire the power line and signal line in parallel with another power line.

5. MAINTENANCE

5. 1 Disassembling and reassembling this product (slave station)

- Slave station(NM4G※2-T8G※)

(1) Loosen the fixing screws on DIN rail of retainer.
(2) Remove the hexagon socket bolts (2 bolts).
(3) Separate the serial transmission blocks and pull out the tie rod.
(4) Pass the serial transmission block through the tie rod and push it between the adjacent blocks without leaving any clearance and then connect.
(5) Make sure that all blocks have been connected without leaving any clearance, and then tighten the hexagon socket bolts.
(Proper tightening torque: 1.1 - 1.3N・m)
(6) Hook the retainer jaw on DIN rail securely, push in the direction of arrow indicated on the retainer and tighten the fixing screws of DIN rail.
(Proper tightening torque: 1.2 - 1.6N・m)

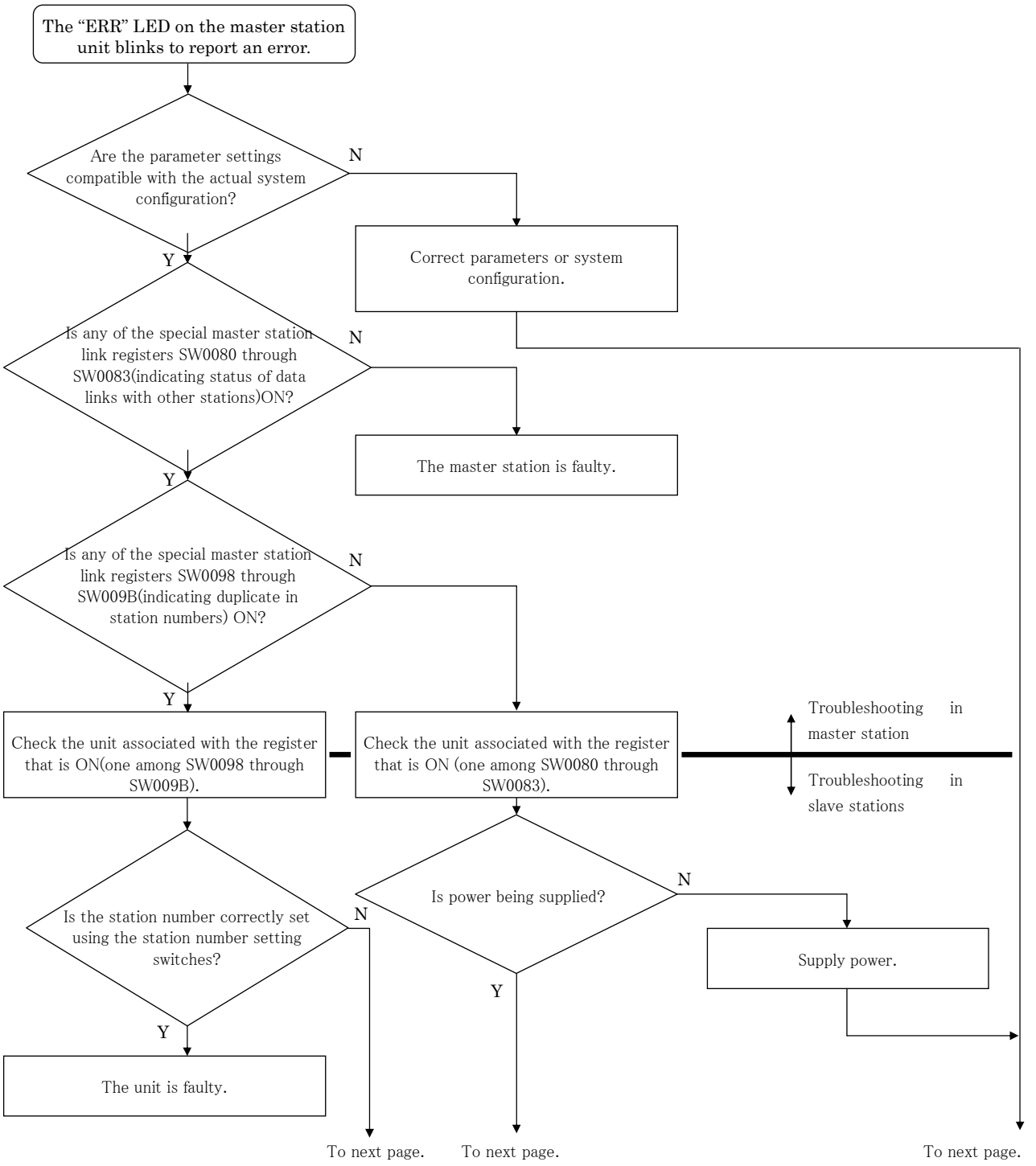


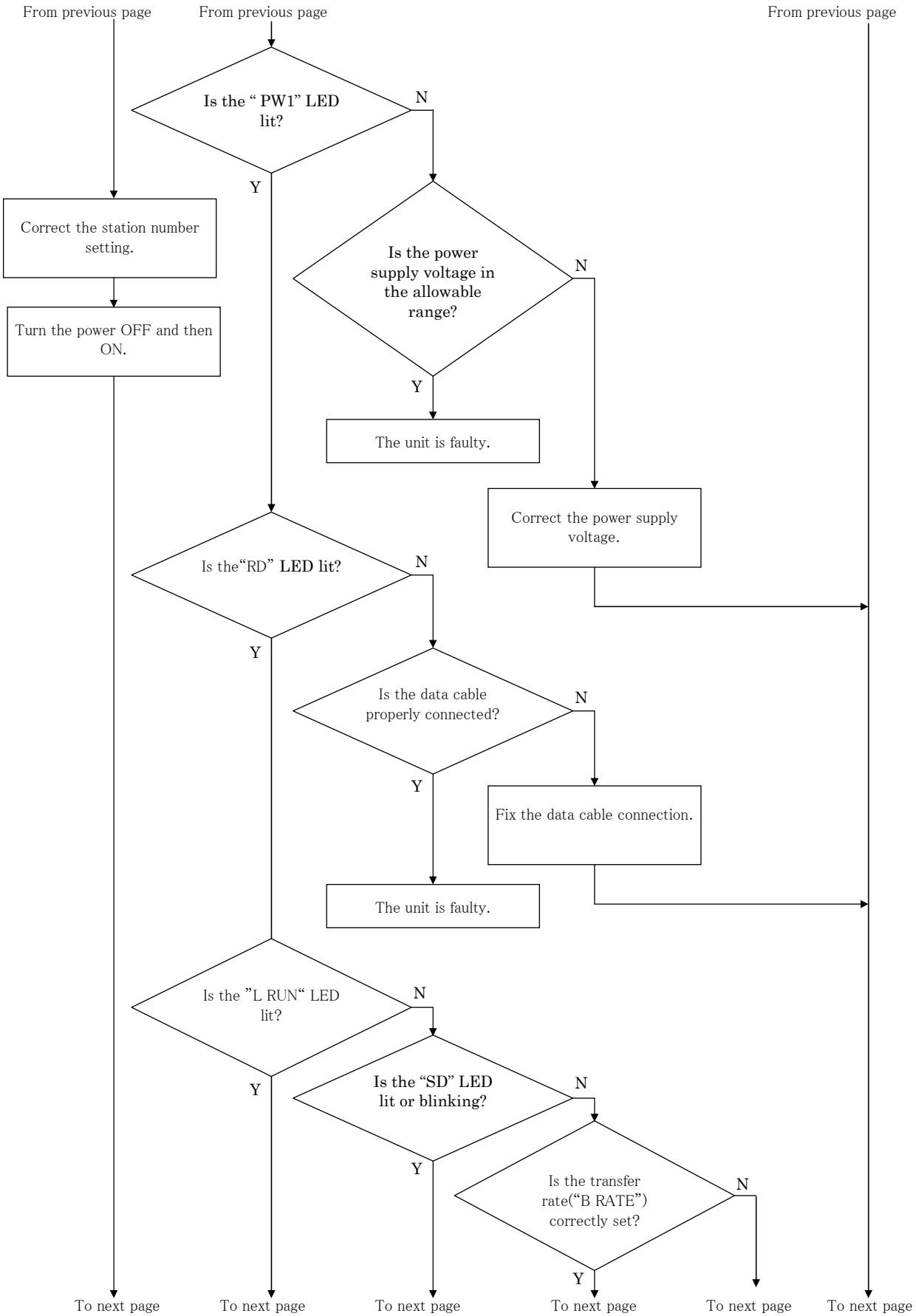
⚠ CAUTION:

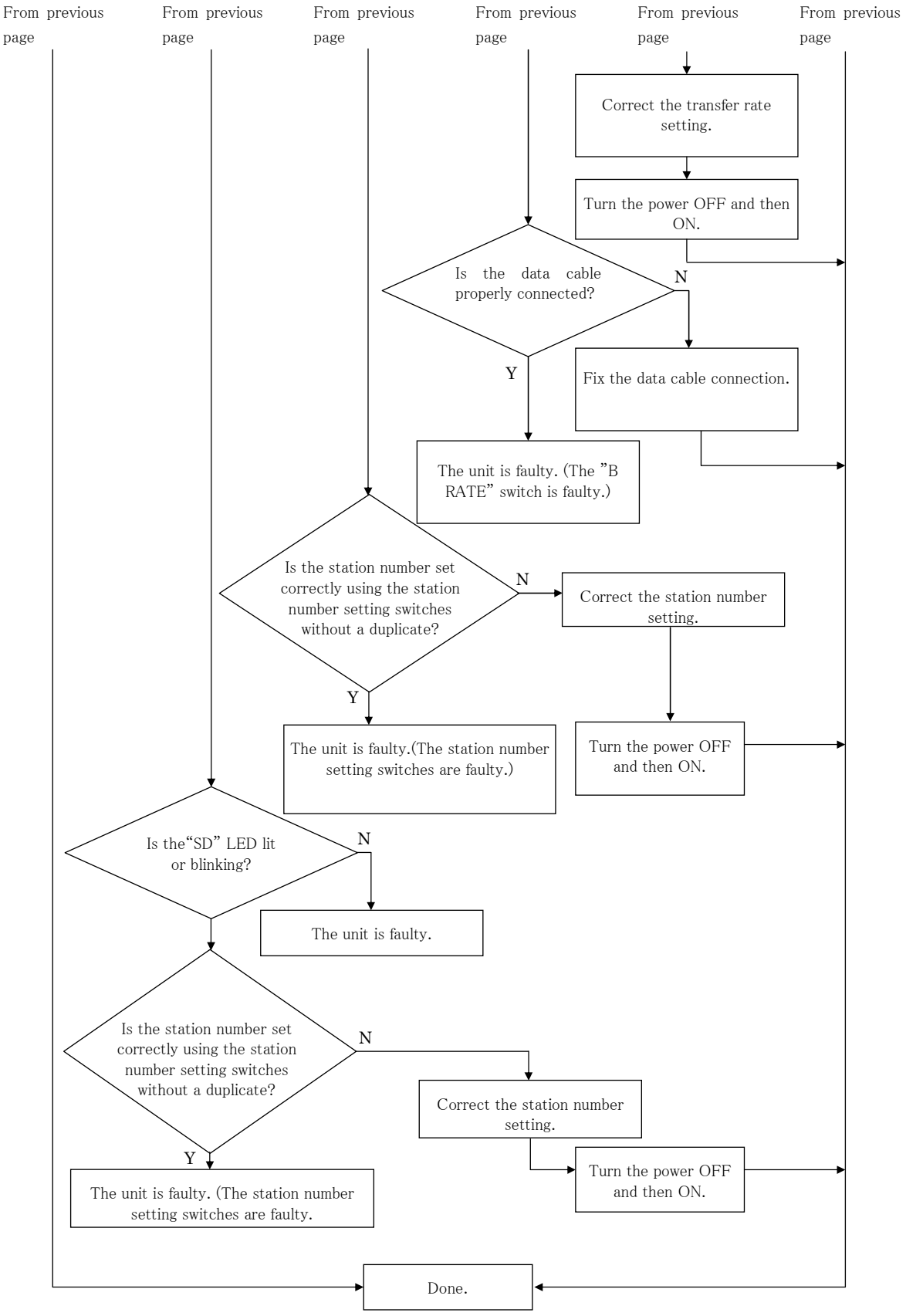
- Before turning the unit power ON, check the slave station address, transfer rate and output setting during abnormal communication.
- Avoid pulling out the slave station while pulling the cable or connector; otherwise, broken circuit and damage may result.
- Touching the electrical wiring connection part (bare live part) may cause an electric shock.

5. 2 Troubleshooting

Troubleshooting should address the entire system rather than a particular slave station. This slave station unit has its LED indicators similar to those provided on a Mitsubishi remote I/O station. Looking at these indicators and the indicators on the master station unit, you can determine the cause and take corrective action. During such troubleshooting operations, refer to Chapter 13"Troubleshooting" of the Mitsubishi User's Manual (CC-Link system master/local units). Additionally, this slave station has a special LED indicator (PW2). If only this LED is off, check the voltage of the power supply to the valve power and the fuse.







6. HOW TO ORDER

- Manifold

MW (4) G (A) (2) (1) 0 – (C8) – (T8G1) (W) (H) (D) – (5) – (3)

(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k)

(a) No. of port		(b) Piping direction		(c) Series model		(d) Operator type	
Code	Description	Code	Description	Code	Description	Code	Description
3	3 port valve	A	Top porting(Direct piping)	2	MW4G2	1	2-position single
4	5 port valve	B	Side porting(Base piping)			2	2-position double
		Z	Back porting(Base piping)			3	3-position CC
						4	3-position ABR
						5	3-position PAB
						1	Normal close NC (3GA)
						11	Normal open NO (3GA)
						8	Mix

(e)Connecting port diameter		(f)Wiring type		(g) Pin layout		(h) Option	
Code	Description	Code	Description	Code	Description	Code	Description
See table 1 (※1)		T8G1	16 point output	No code	Standard	No code	No option
		T8G2	32 point output	W	Double wiring type	M	Manual override of non-locked type
		T8G7	16point output/input			M7	Manual override with OFF function
						H	Wrong operation prevention valve(※2)
						K	External pilot
						A	Ozone and cutting oil
						F	Built-in A･B port filters
						Y※※	Input/output block(※3)

(i) Mount type		(j) No. of stations		(k) Voltage	
Symbol	Description	Code	Description	Code	Description
No mark	Direct mount	2～16	No. of stations	3	DC24V (※4)
D	DIN rail mount				

Table 1: (e) Connecting port

	Symbol	Connection specifications	MW4GA2	MW4GB2	MW4GZ2
A/B Port	C4	One-touch joint ϕ4	●	●	●
	C6	One-touch joint ϕ6	●	●	●
	C8	One-touch joint ϕ8	●	●	●
	06	Rc1/8	●		
	CL6	One-touch joint L-shape ϕ6		●	
	CL8	One-touch joint L-shape ϕ8		●	
P/R Port (one-touch joint)			ϕ8, ϕ8 L-shape ϕ10, ϕ10 L-shape		

※1 The diameter of the P･R port is specified by the air intake/exhaust block.

※2 For the 3-position all-port block and PAB connection, valve specifications(H) for the malfunction prevention are not available.

※3 A numeric value showing the combination of continuos number of input/output block stations is put in ※※.

※4 For the serial transmission connection specifications, AC 100V and DC12V settings are not provided.

For details, check the catalog.