

INSTRUCTION MANUAL**SERIAL TRANSMISSION TYPE****M4G $\frac{A}{B}$ 4-T6G1**

- 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.

For Safety Use

To use this product safely, 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 instruction manual carefully for proper operation.**

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

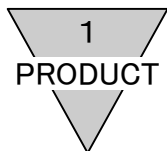
CAUTION :

- Incorrect address settings of serial transmission slave stations could cause the solenoid valve and the cylinder to malfunction.
Before using the product, check the set address of the slave stations.
- For operation of 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.

INDEX

M4G^A_B4-T6G1
Serial Transmission Type
Manual No. SM-P00049-A

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1. PRODUCT

1.1 General outline of the system

1) M4GA/B4-T6G1

This solenoid valve system is equipped with a remote I/O station (slave station unit OPP3-1G), MELSEC-A sequencer, made by Mitsubishi Denki Company Ltd. And Qna series field network; the CC-Link system.

- (1) It helps to curtail wiring man-hours as it requires twist pair cables only to connect it with PLC.
- (2) Up to 64 units of the slave station OPP3-1G having 16 output points, are able to be connected to one master unit, made by Mitsubishi Denki Company Ltd.
- (3) The source of power for unit and valve can be installed individually and each unit has a monitor LED indicator.
- (4) The charging of power for valve is verified on the side of sequencer by means of communication.
The location of electric trouble such as abnormal condition of power or burnt out fuse is detected easily.
- (5) HLD/CLR switch helps choosing either holding output signal or All points OFF.

2) CC-Link System

The CC-Link is one of MELSEC-A PLC, made by Mitsubishi Denki Company Ltd. And Qna series field network systems including remote I/O devices 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 system has the following features;

- (1) To a single master station, the CC-Link system allows the connection of up to 64 remote I/O stations and the control over up to 2048 input and output points.
- (2) The scan time achieved through the links between the master and remote I/O stations is 4 ms when the number of the controlled I/O points is 2048 (at the data transfer rate of 10M bps).
- (3) The CC-Link system allows cyclic transfer not only of bit data but also of word data.

The CC-Link is maintained and controlled by the CC-Link Association (CLPA).

Note : Read this User' s Manual and the CKD' s Solenoid Valve Instruction Manual without fail before using the solenoid valve system.

Whilst this manual chiefly describes solenoid valve and slave station (OPP3-1G.). This manual chiefly describes the solenoid valve system and the slave station (OPP3-1G) installed to it. Another units (master, slave station) which allows connection with the CC-Link, refer to the corresponding user's manuals. Before using the solenoid valve system, you are requested to study its functions and performance by reading both this manual and the Solenoid Valve Instruction Manual without fail.

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>

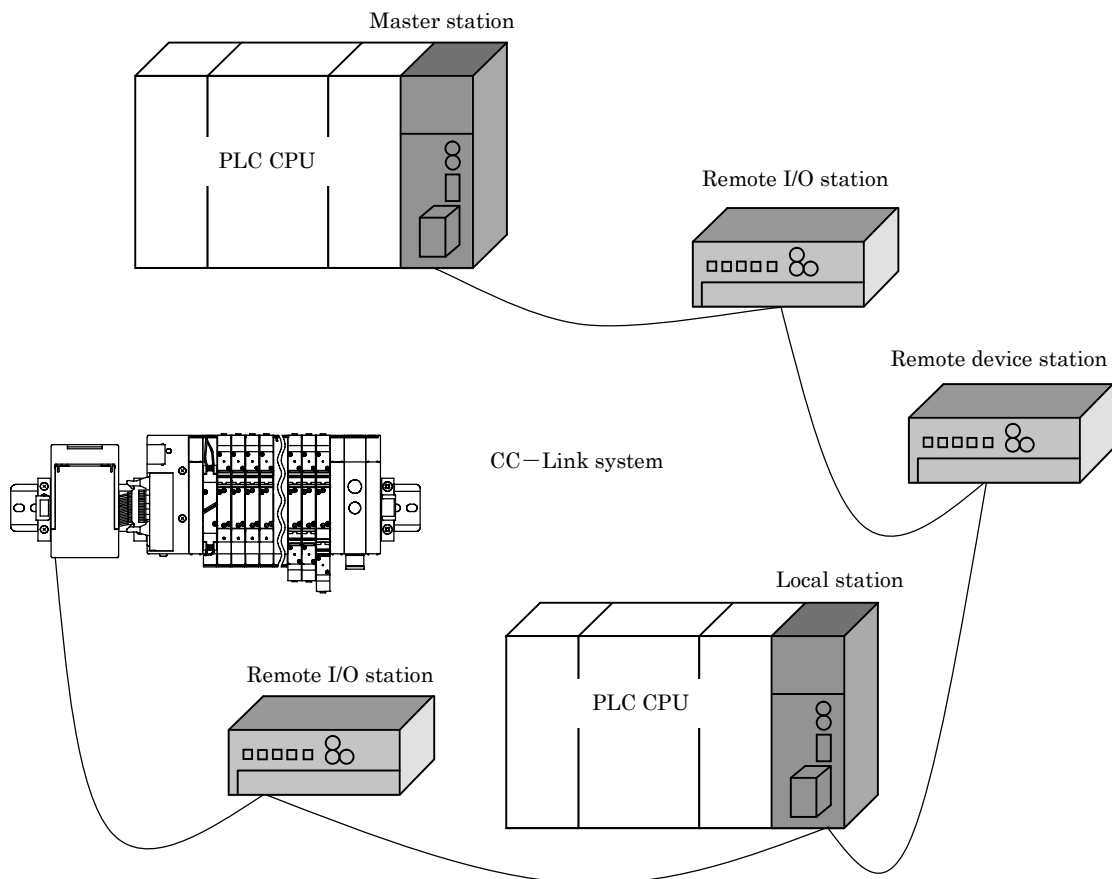
1.2 Structure of the System

This system chiefly consists of PLC body, Master unit, Solenoid valve and peripheral equipment.

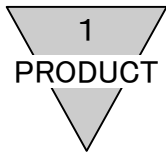
- Combination of PLC and Master unit

PLC Maker	Type of Master Unit
Mitsubishi Denki Company Ltd.	AJ61BT11
	A1SJ61BT11
	AJ61QBT11
	A1SJ61QBT11
	QJ61BT11
etc.	The Master Unit adaptable 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) Valve specification

(1) Common specifications

Description		Specifications	
		M4GA4 series	M4GB4 series
Manifold type		Integrated base	
How to install the product		Direct mount type	
Air supply and exhaust method		Common supply and common exhaust	
Pilot exhaust method	Internal pilot	Main valve and pilot valve common exhaust (Pilot exhaust check valve integrated)	
	External pilot	Main valve and pilot valve individual exhaust	
Piping direction		Valve top direction	Sub-base side porting
Valve type and operation		Pilot operated soft spool valve	
Working fluid		Compressed air	
Max. working pressure	MPa	0.7	
Min. working pressure	MPa	0.2 (external pilot 0)	
Proof pressure	MPa	1.05	
Ambient temperature	°C	-5~55	
Fluid temperature	°C	5~55	
Manual override		Non-locking/locking common type	
Lubrication	Note1	Not required	
Degree of protection		Dust proof	
Vibration/shock	m/s ²	50 or less/300 or less	
Atmosphere		Use in the environment containing corrosive gas is not permissible.	

Note 1: Use the turbine oil Class 1 ISOVG 32 if lubricated. When lubricated excessively or intermittently, the operation could result in unstable.

(2) Electrical specifications

Item	Specification
Rated voltage [DC] (V)	24
Voltage fluctuation range	±10%
Holding current (A)	0.042
Power consumption (W)	1.0
Heat-proof class	B
Surge absorber	Standard item
Indicator	LED

(3) Port size

Model no.		M4GA4		M4GB4		
Pilot operated		Standard	External pilot	Standard		External pilot
Description		(Internal pilot)	(Option : K)	(Internal pilot)		(Option : K)
Port size	A・B port	Push-in joint φ 8, φ 10, φ 12 Rc3/8 G3/8 NPT3/8		Push-in joint φ 8, φ 10, φ 12 Rc1/4,Rc3/8 G1/4,G3/8 NPT1/4,NPT3/8	Rc1/2 G1/2 NPT1/2	Push-in joint φ 8, φ 10, φ 12 Rc1/4,Rc3/8 G1/4,G3/8 NPT1/4,NPT3/8
	P・R1・R2 Port	Rc1/2 G1/2 NPT1/2		Rc3/8 G3/8 NPT3/8		Rc1/2 G1/2 NPT1/2
	External pilot port		Rc1/8 G1/8 NPT1/8			Rc1/8 G1/8 NPT1/8

(4) Response time

Model no.			4GA4 / 4GB4	
Description			When turned ON	When turned OFF
Response time ms	2-position	Single solenoid	40	40
		Double solenoid	40	
	3-position	ABR connection	60	60

Response time is the value at an air supply of 0.5MPa, 20°C, and oil-free.

The value will change based on quality of pressure and oil.

(5) Flow characteristics

Model no.	Exhaust port Port size	Solenoid position		P→A/B		A/B→R1/R2	
				C dm ³ /(s·bar)	b	C dm ³ /(s·bar)	b
M4GA4	Rc1/2 G1/2 NPT1/2	2-position		7.3	0.12	9.0	0.17
		3-position	All ports closed	6.4	0.15	8.2	0.22
			ABR connection	6.4	0.16	9.3	0.19
			PAB connection	8.0	0.08	8.3	0.22
M4GB4	Rc3/8 G3/8 NPT3/8	2-position		6.4	0.42	6.9	0.12
		3-position	All ports closed	6.0	0.37	6.8	0.12
			ABR connection	6.1	0.38	7.1	0.15
			PAB connection	6.0	0.37	6.8	0.13
	Rc1/2 G1/2 NPT1/2	2-position		8.3	0.23	9.0	0.21
		3-position	All ports closed	7.4	0.15	8.8	0.19
			ABR connection	7.5	0.15	9.5	0.21
			PAB connection	7.7	0.21	8.7	0.18

Sonic conductance C (Effective sectional area $S \approx 5.0C$)

Critical pressure ratio b

(6) Weight

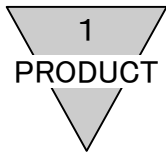
•Weight of valve for manifold

Model no.			4GA4	4GB4
Weight	2-position	Single solenoid	322	259
		Double solenoid	386	319
	3-position		417	354

•Weight of manifold base

	M4GA4		M4GB4		
Pilot operated	Internal pilot	External pilot	Internal pilot		External pilot
Maximum station number	8 station	8 station	8 station	8 station	8 station
Exhaust port Port size	Rc1/2 G1/2 NPT1/2		Rc3/8 G3/8 NPT3/8	Rc1/2 G1/2 NPT1/2	
Weight calculation formula [g] (n: Number of stations)	150n+1016	379n+2391	292n+1864	391n+2432	392n+2329

The manifold base weight is the value for female thread type specifications.



2) Transmission specifications

Item	Specification
Transfer rate	156k/625k/2.5M/5M/10M bps (selectable)
Max. transfer distance (overall cable length)	Depends on transfer rate (Note 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 "Wiring".)

Note 1 Max. transfer distance

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

Note Transmission distance

In CC-Link, the transmission distance varies as follows, depending on the transmission speed.

- In the case of multi-drop connection (Ver.1.10):

B RATE	Transmission Speed	Interstation Cable Length	Total Cable Extension
4	10Mbps	0.2m or more	100m
3	5Mbps		160m
2	2.5Mbps		400m
1	625kbps		900m
0	156kbps		1200m

- In the case of T-branch connection:

B RATE	Transmission Speed	Maximum Main Line Length	Maximum Branch Line Length	Interstation Cable Length in Remote I/O or Remote Device Station	Interstation Cable Length between Anterior & Posterior Stations in Master/Local Stations or Intelligent Device Station
1	625kbps	8m	50m	0.3m or more	1m or more (※1)
0	156kbps		200m		2m or more (※2)

※1 The cable length exceeds 1 meter where the system configuration is only the remote I/O station or remote device station.

※2 The cable length exceeds 2 meters where the system configuration includes the local station or intelligent device station.

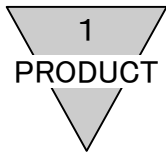


CAUTION :

- The transmission distance described above indicates the distance in configuring the entire system with Ver. 1.10 compatible unit and cable. Where Ver. 1.00 compatible unit is connected to even one unit (compatible with Ver. 1.10), and Ver. 1.00 compatible cable is used for wiring, the system is of Ver. 1.00 type.
For details, refer to the Master Station User's Manual.
- Since the wiring distance, etc. differs where the system is used with Ver. 1.00, refer to the Master Station User's Manual.
- In Ver. 1.10, mixed use of cable manufacturers is allowable. In Ver. 1.00, however, no mixed use of cable manufacturers is allowed.
- There are various limits to T-branch connection, such as usable cables and the number of units to be connected.
Be sure to refer to the Master Station User's Manual and check the contents before wiring.
- Since the transmission distance changes, depending on the transmission speed and communication cable to be used or the like, see "CC-Link" User's Manual released by MITSUBISHI ELECTRIC or contact the cable maker for its checking.
- Since the number of stations (remote stations) differs, depending on various conditions, such as the number of occupied stations and transmission distance, refer to "CC-Link" User's Manual released by MITSUBISHI ELECTRIC or contact the cable maker for checking.
- No mixed use of cables only for CC-Link and high-performance cables only for CC-Link is allowed.

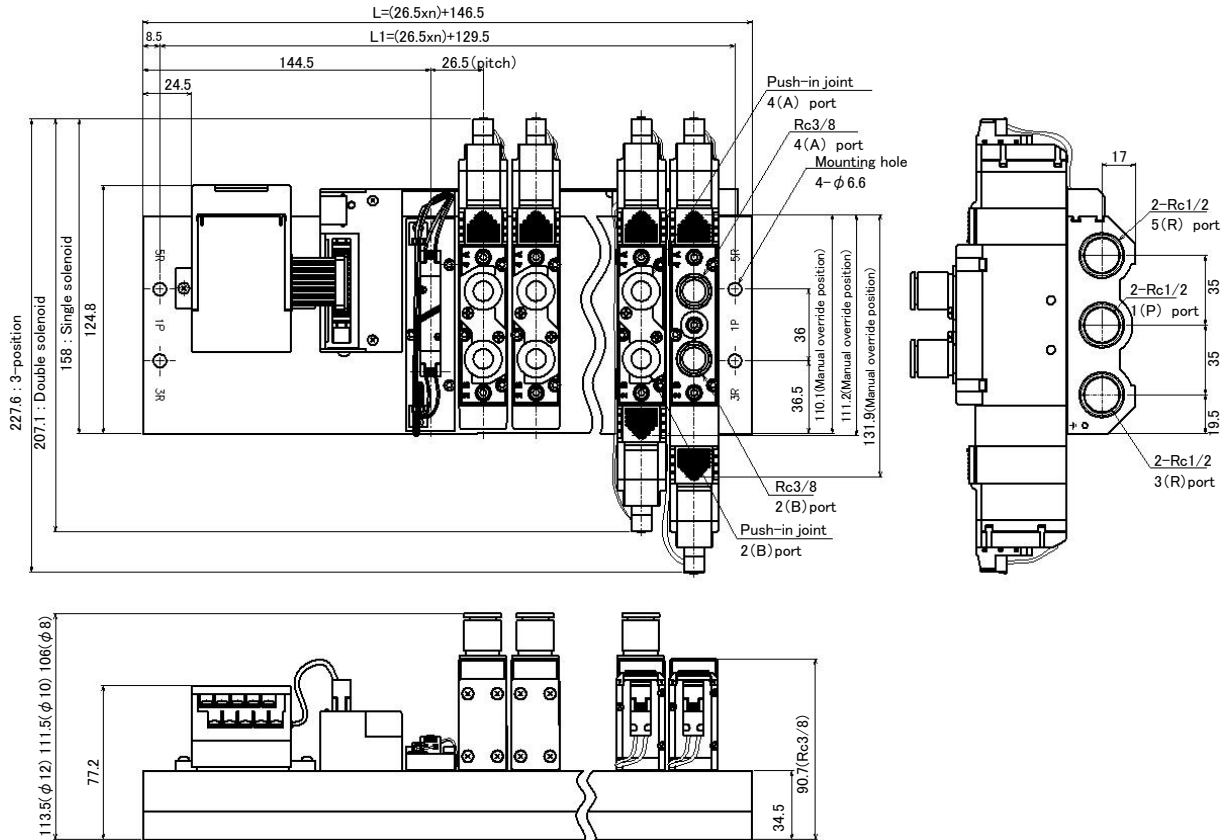
3) Slave station specification

Item		Specification
Communication object		CC-Link Ver1.10 (Note 1)
Power supply voltage(Unit side)		DC21.6V to 26.4V (DC24V $\pm 10\%$)
Consumption current(Unit side)		100mA or lower (While 16 output are ON.)
Power supply voltage(Valve side)		DC22.8V to 26.4V (DC24V $\pm 10\%$, -5%)
Consumption current(Valve side)		15mA or lower (While all points are OFF.)
Insulation resistance		Between all external terminals in a lump and Case 20M Ω or more DC500VM
Withstand voltage		Between all external terminals in a lump and Case AC500V for 1 minute
Noise resistance		500Vp-p Pulse width 100nsce, 1 μ sec
Mechanical vibration proof	Durability	10Hz to 150Hz to 10Hz 1 octave / min. 15 sweeps in the 3 each axis of X, Y and Z while the half amplitude is 0.75mm or 10G whichever smaller.
	Wrong operation	10Hz to 150Hz to 10Hz 1 octave / min. 4 sweeps in the 3 each axis of X, Y and Z while the half amplitude is 0.5mm or 7G whichever smaller.
Mechanical shock proof		30G 3 directions 3 times
Ambient temperature		0 to 55°C
Ambient humidity		30 to 85%RH (No dew fall)
Working environment		No corrosive gas
No. of output points		16 points
Output insulation type		Photo coupler insulation
Max. load current		100mA/1 point
Leak current		0.1mA or lower
Residual voltage		0.5V or lower
Output model		NPN Transistor, Open collector output
Operating indication		LED (power lamp and communication status indicator only)
No. of monopolized stations		1 station

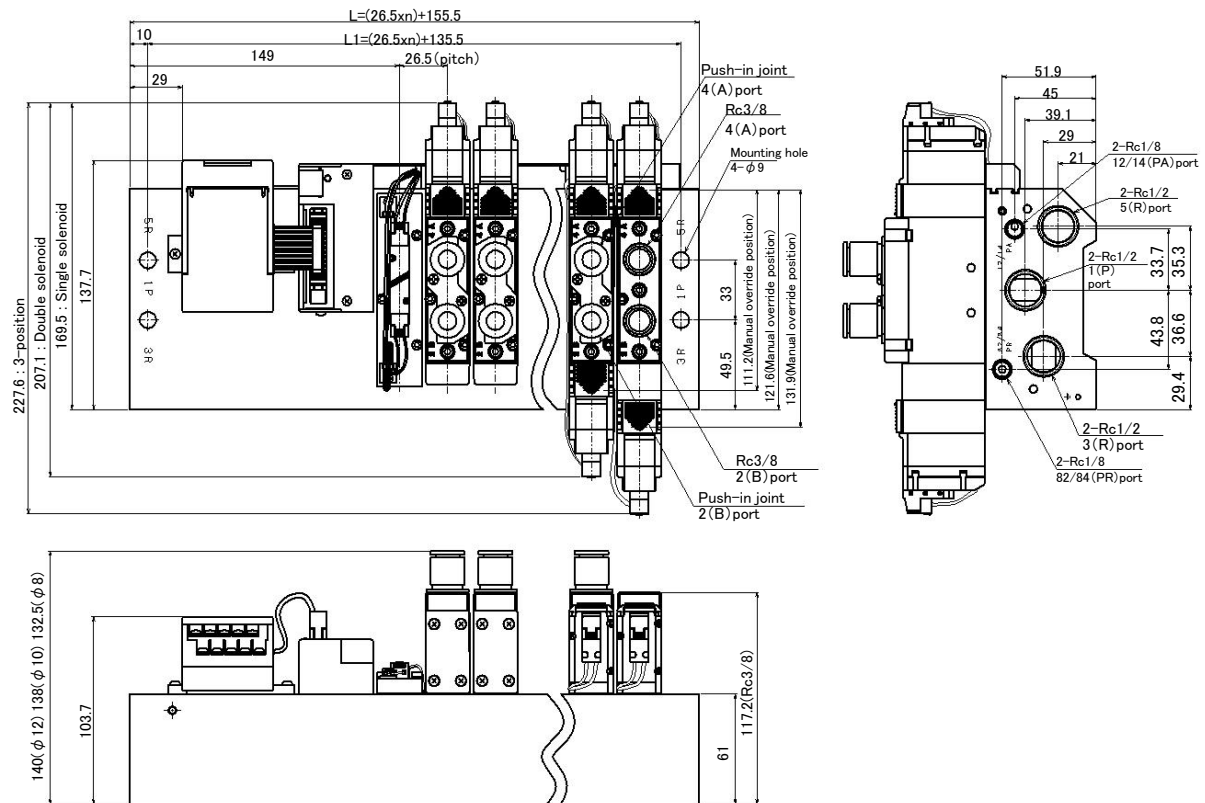


1.4 Outside view of valve

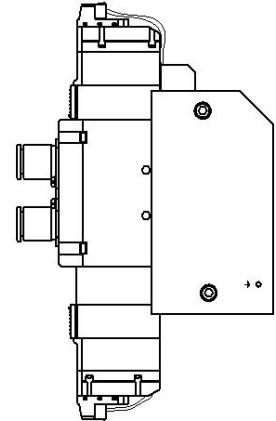
- M4GA4 Internal pilot



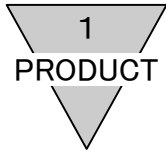
- M4GA4 External pilot (K)



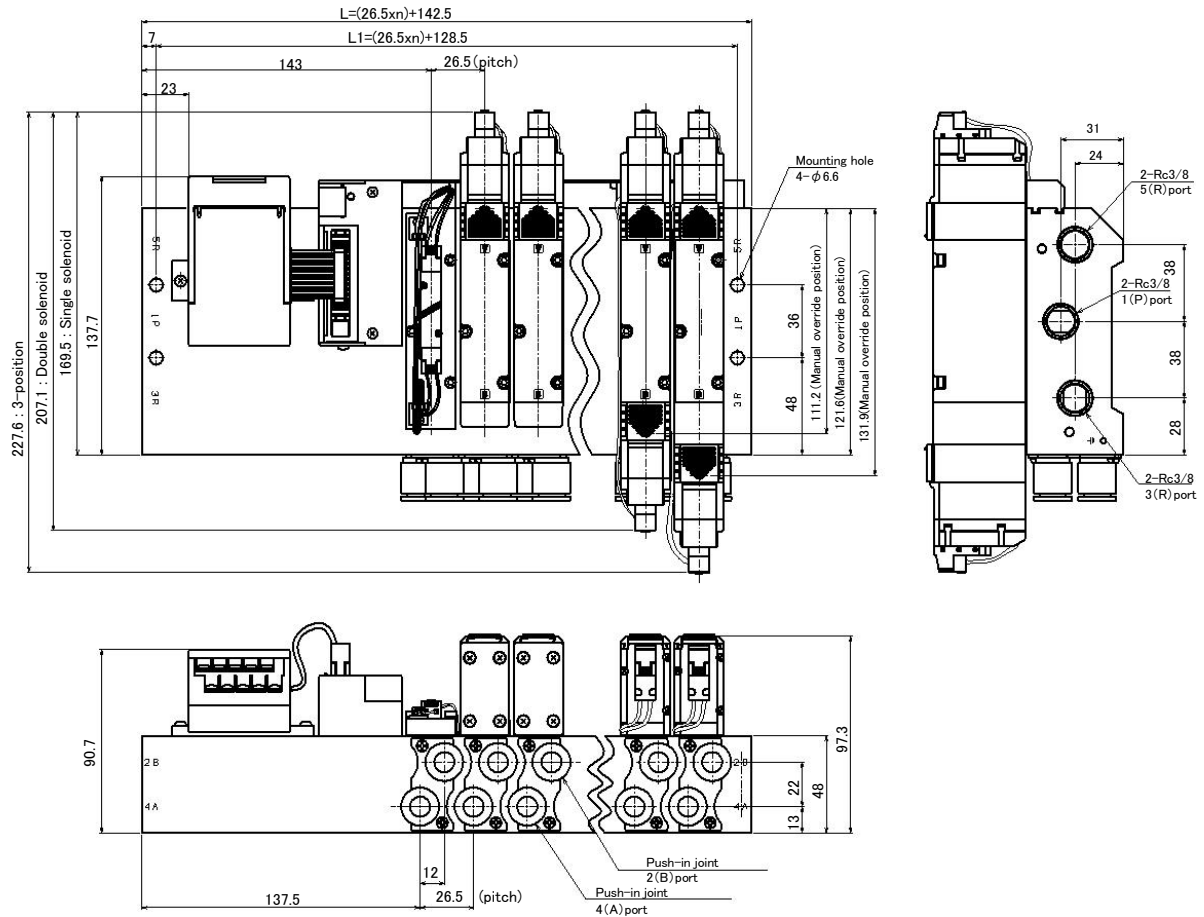
-
- 277.6-3-position
- 207.1-Double solenoid
- 169.5: Single solenoid
- 137.7
- 40
- 59
- 179
- $L=(26.5 \times n)+215.5$
- $L1=(26.5 \times n)+135.5$
- 26.5 (pitch)
- 5R
- 1P
- 3R
- Push-in joint
- 4(A) port
- Rc3/8
- 4(A) port
- Mounting hole
- 3R
- 1P
- 5R
- 49.5
- 33
- 111.2 (Manual override position)
- 121.6 (Manual override position)
- 131.0 (Manual override position)
- Rc3/8
- 2(B) port
- Push-in joint
- 2(B) port



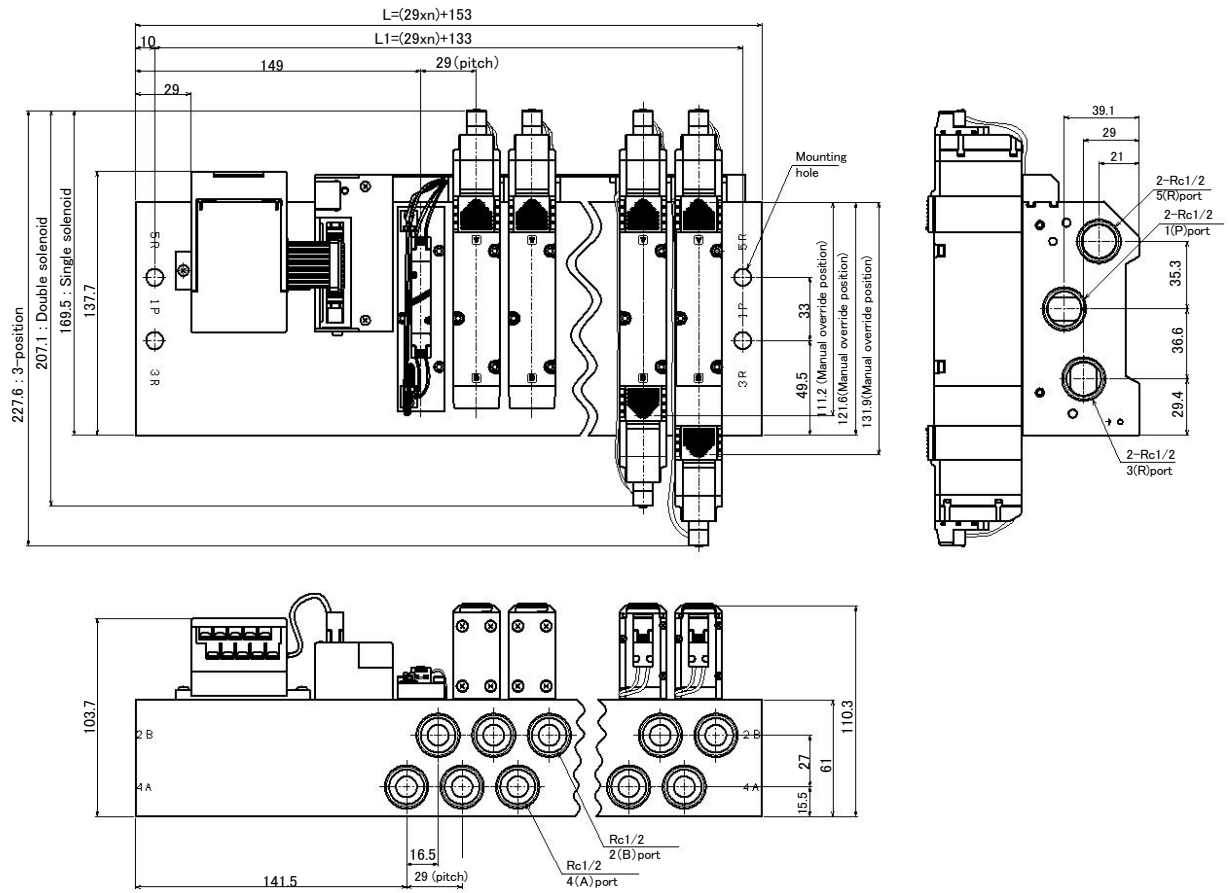
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- M4GB4 Internal pilot

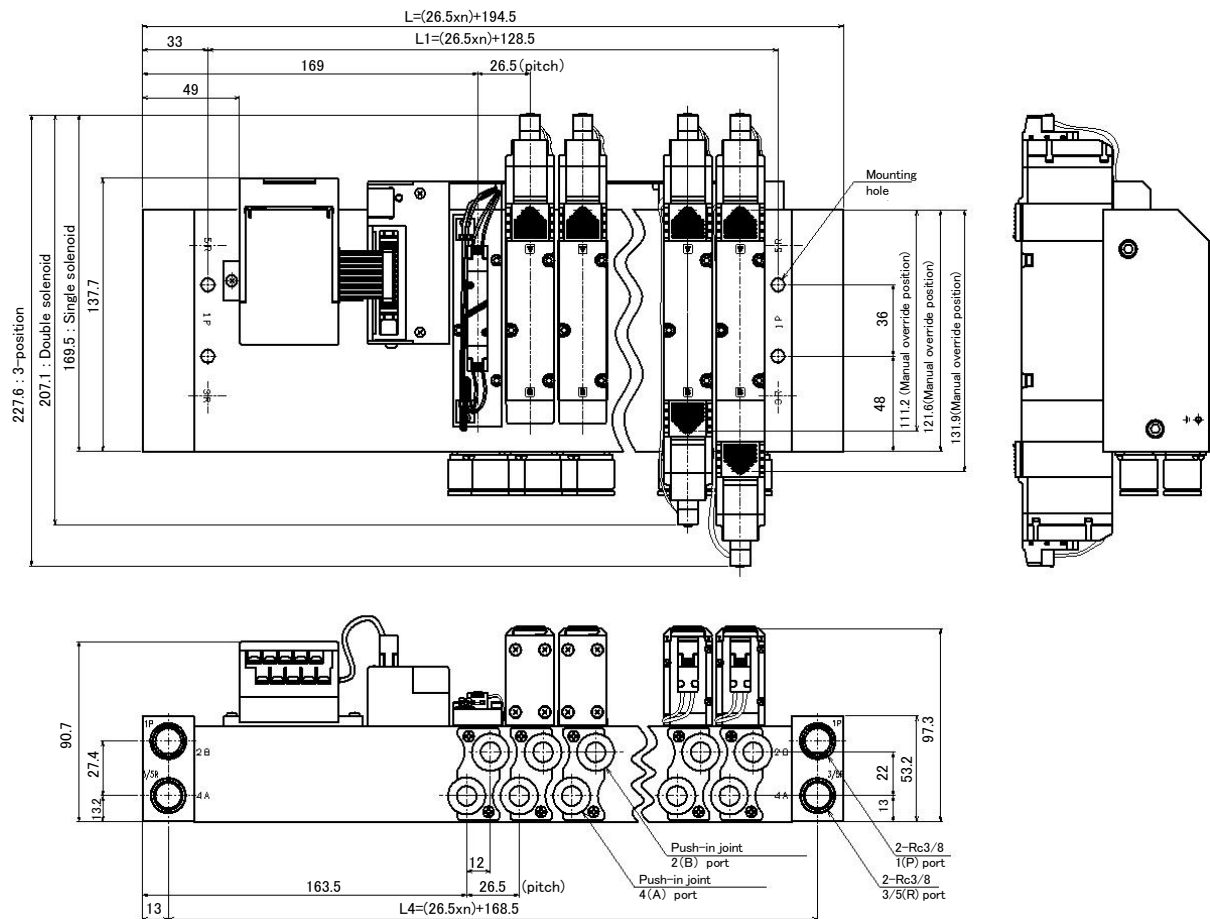


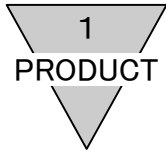
- M4GB4 R1/2 female thread type (15)



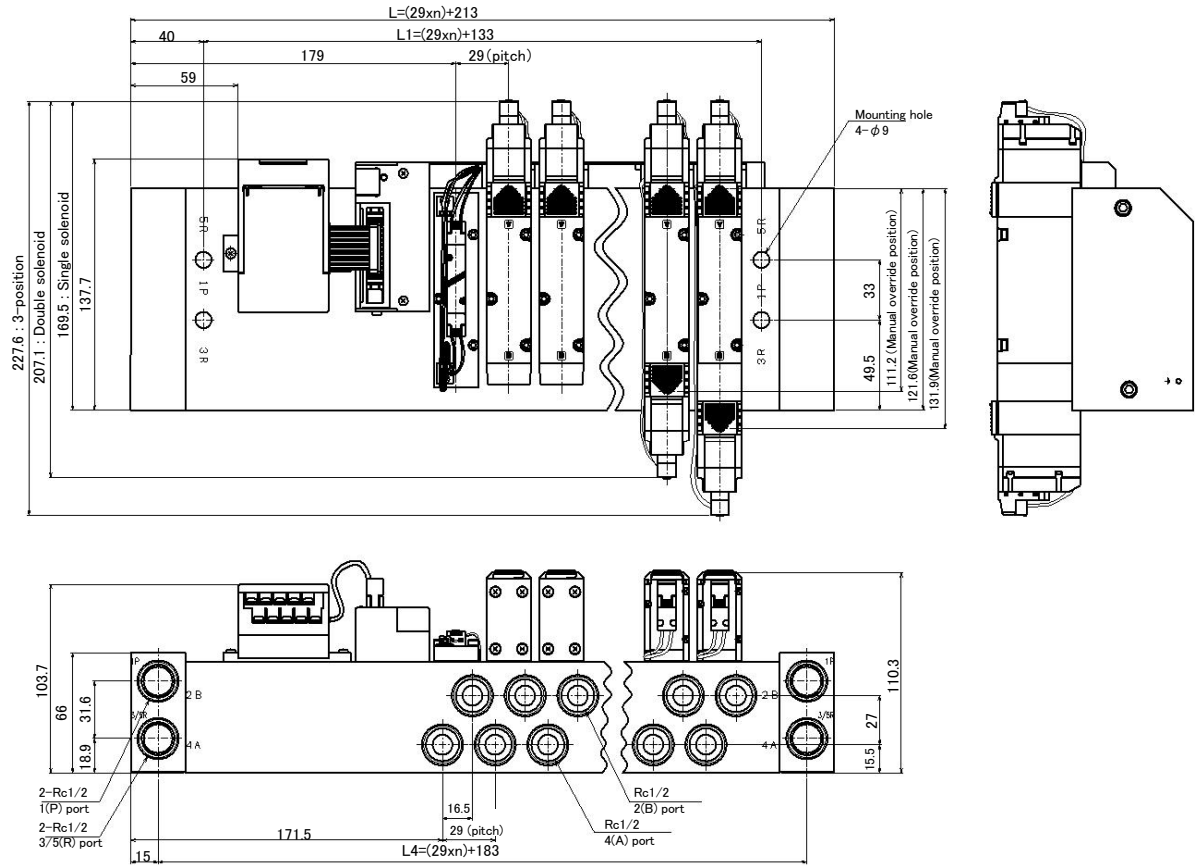
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- M4GB4 Internal pilot Supply and exhaust block (Q)

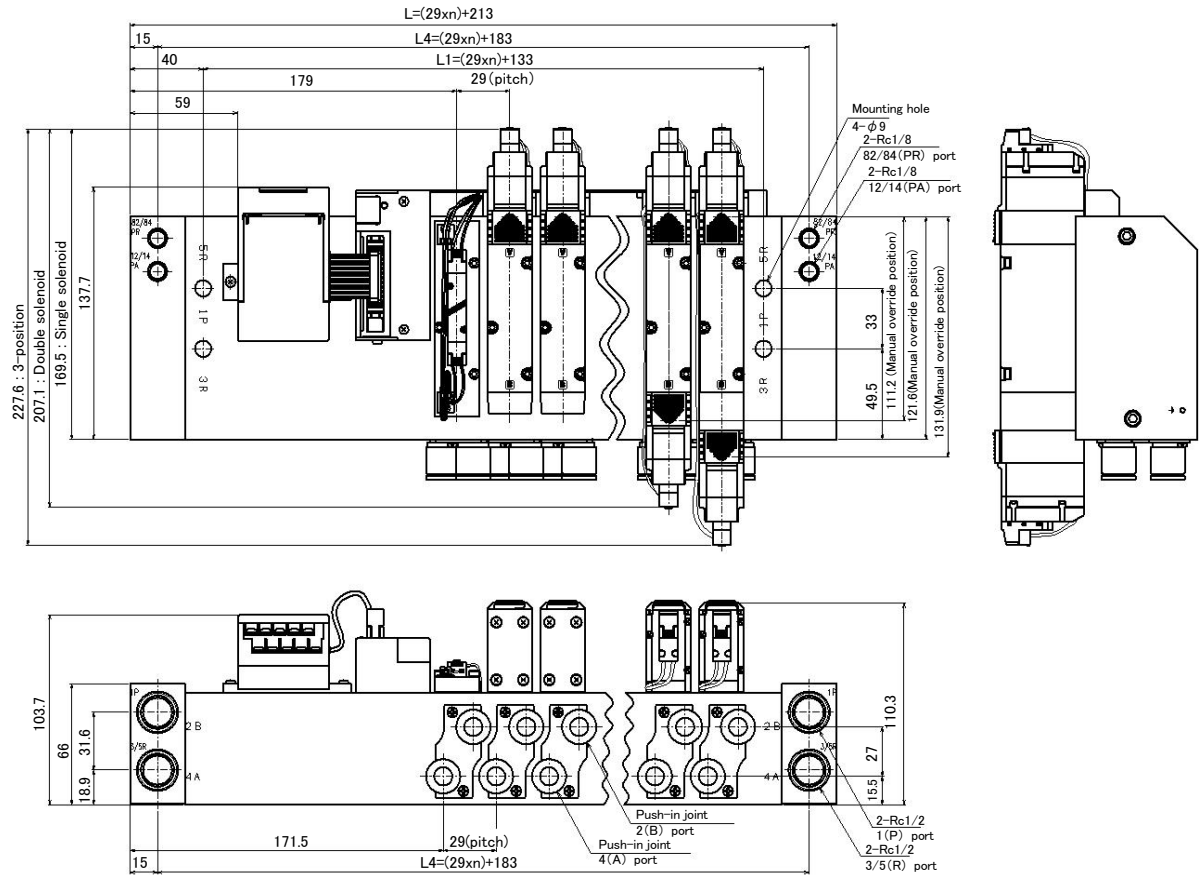




- M4GB4 Internal pilot R1/2 female thread type (15) Supply and exhaust block (Q)



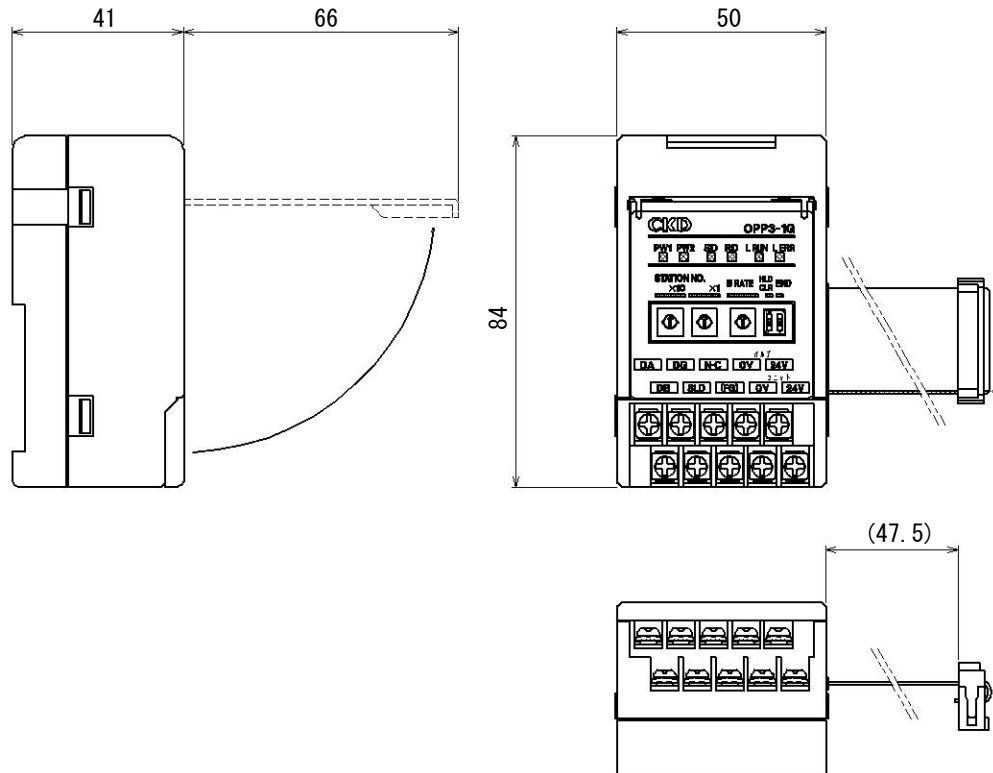
- M4GB4 External pilot (K) Supply and exhaust block (Q)





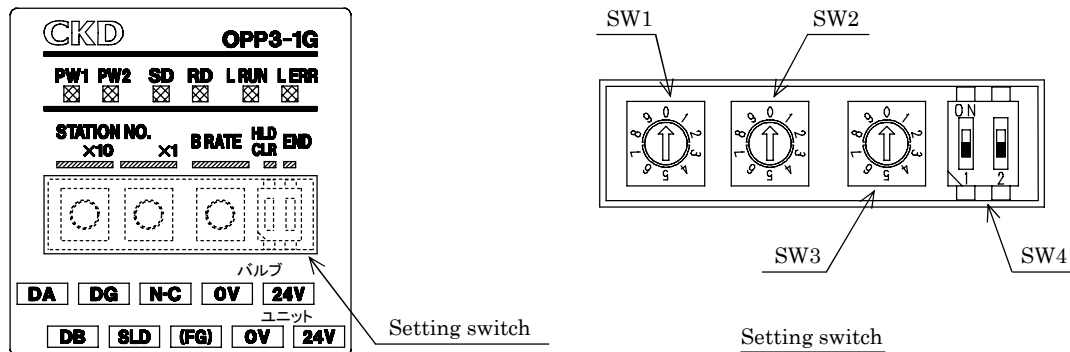
1.5 Slave station for valve

1) Appearance



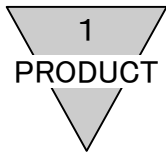
2) Indicators and switches on Slave station

- (1) Various LED lamps are installed in front of station to aid visual varification of operational conditions. Each function is printed on the sheet made of resin. The content of each function is posted in the table below. Make use of them during maintenance works or for varification 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	Used for checking the normality of data transfer between the slave and master stations: lit when data is received normally from the master station and goes off when data is absent for a preset period of time. (Lit again when data is received normally.)
L ERR	Lit when a transmission error (CRC error) is detected. Goes off after a preset period of time. (The RUN indicator goes off at the same time.) Lit when the user specifies a value out of range when setting the station number or transfer rate. (Lit again when the user corrects the setting and reboots the system.) Blinks when the station number or transfer rate setting is modified during operation. (The RUN indicator remains lit; the slave station operates with the station number and transfer rate set upon startup.)

Name of Switches	Content of Setting
Station number setting switch (SW1・SW2)	Sets the slave station numbers within the bounds of 1 to 64. SW1 takes care of the second digit (10) while SW2 takes care of the first digit (1).
Transfer rate setting switch (SW3)	Sets the transfer rate between the master and slave stations. A value ranging from 0 to 4 is set.
Switch used for specifying the state of output after error (SW4 : HDL / CLR)	Specify whether to hold (HDL) or clear (CLR) the output when an error occurs.
End station setting switch (SW4 : END)	Turn ON this switch if this slave station is connected to the farthest end from the master station. ※ Turn OFF this switch if the CC-Link special high-performance cable is used and connect relevant resistor. (For details, see section 3.1.)



- (2) Setting switch sets the valve slave station number and transmission speed. (Refer to “Chapter 3. Operation”.) Be sure to set it before turning power to valve slave station ON.

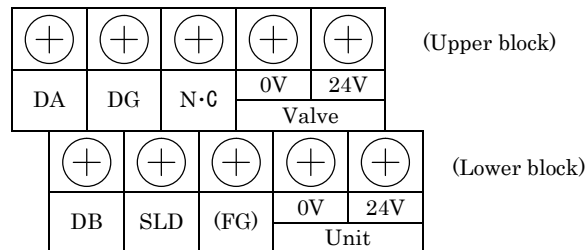


CAUTION :

- Set the switch always with the serial transmission unit block power “OFF”.
- The serial transmission unit block cover can be opened and closed at one touch.
Except when the switch is set, be sure to keep the cover closed; otherwise, foreign matter may intrude into the internal circuit part from the cover unit, thus resulting in failure or malfunctioning, and also causing damage to the cover.
Even during setting, take special care so that foreign matter or particle does not enter the interior.
- The setting switch is precision made; rough handling may, therefore, cause damage thereto. Also absolutely avoid touching the internal circuit board during setting.

There are terminal blocks provided on the mounting device. Wiring connection to station is accomplished through these terminal blocks. Function of each terminal is printed on the face of station mounting device.

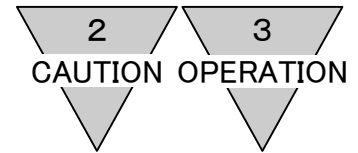
- Choose 6.6mm wide or less of M3 crimp type terminal metal piece and tighten it with torque of 0.3 to 0.5N · m.



Terminal symbols and functions

Symbol	Function	Major objects to be connected
DA DB DG	Data terminal	Connect them with the data terminals (DA, DB, and DG) of the master station or of a remote I/O or remote device station.
SLD	Shield terminal	Connect with the shielding in the shielded twist pair cable. (※1)
N·C	Not used	Do not use this terminal.
(FG)	Ground terminal	Ground this terminal without fail (independent grounding for the PLC system only; grounding resistance 100 ohms or less). (※1)
Power for Unit	Power for Units	Apply source of power with less noise, such as DC24V±10%.
0V		
24V		
Power for Valves	Power for Valves	Apply source of power with less noise, such as DC24V±10%.
0V		
24V		

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



2. CAUTION

1) Output transmission delay time

Refer to “Mitsubishi Denki Co. Users’ manual” 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.

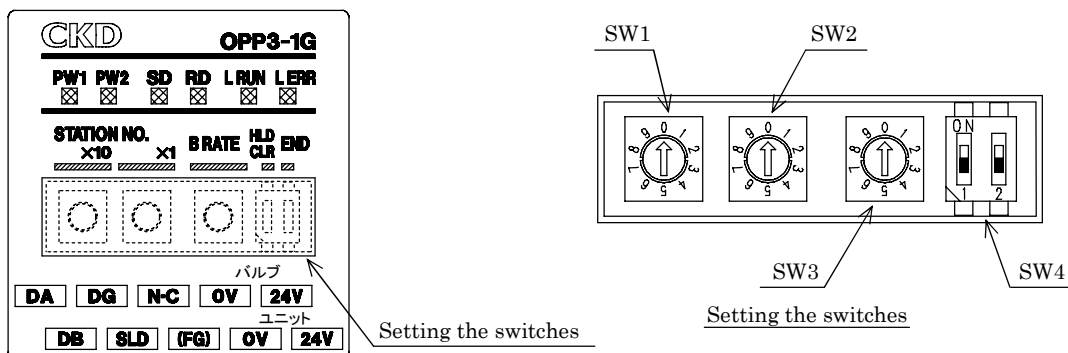
Solenoid valve responding time, of course, varies depending on model. It is advisable of referring to valve specification.

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.

3. OPERATION

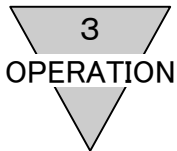
3.1 Switch setting

The switches are used for four different kinds of setup: setting the station number, setting the transfer rate, specifying whether to hold or clear the output during an error, and specifying the end station. 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 :

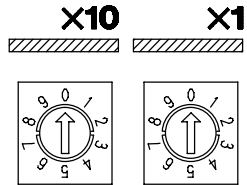
- Set the switch always with the serial transmission unit block power “OFF”.
- The serial transmission unit block cover can be opened and closed at one touch. Except when the switch is set, be sure to keep the cover closed; otherwise, foreign matter may intrude into the internal circuit part from the cover unit, thus resulting in failure or malfunctioning, and also causing damage to the cover. Even during setting, take special care so that foreign matter or particle does not enter the interior.
- The setting switch is precision made; rough handling may, therefore, cause damage thereto. Also absolutely avoid touching the internal circuit board during setting.



1) Station number setting (SW1 and SW2)

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

STATION NO.

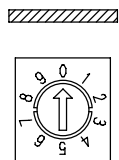


- Use the “×10” switch to specify the 10 column digit in the station number.
- Use the “×1” switch to specify the 1 column digit in the station number.
(Can't use the same station No.)

2) Transfer rate setting (SW3)

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

B RATE



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

Be sure to set the switch to a position between 0 to 4.



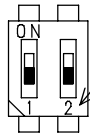
CAUTION :

- Set the transmission speed to the same level as with all master stations, local stations and remote stations on the network. If the setting differs in even one station, no normal data link can be achieved.

3) Other setups (SW4)

Using this switch, specify whether to hold or clear the output when an error occurs and whether this slave station is the end station (station furthest from the master station) or not.

HLD CLR END

Switch No.

Switch No.	Function	Position	
		OFF	ON
No.1	Specifies whether to hold or clear the output when an error (bus line error, time-over, etc.) occurs.	Clear	Hold
No.2	Sets the end station. (110 Ω-terminating resistor is built-in.) ※ Turn OFF this switch if the CC-Link special high-performance cable is used. (See also the Fig. below.)	In setting the middle station	In setting the end station

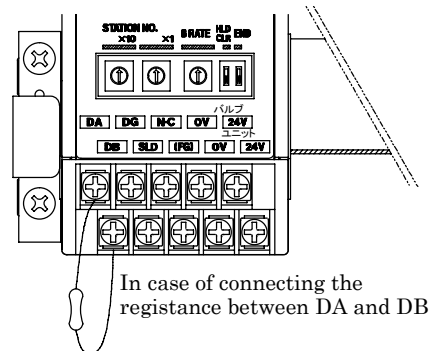
※1

※1. If a terminal resistor is connected externally (on a terminal block), be sure to set this switch to OFF.

※ End station settings when using the CC-Link special high-performance cable

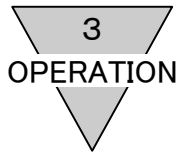
If the CC-Link special high-performance cable (FANC-SBH made by Kuramo Denko, etc.) is used for the communication cable and this slave station is the end station, always turn OFF the end station setting (SW4 No. 2). Additionally, 130 Ω-terminating resistor (1/2W), which is purchased on the general market or supplied with the master station, is connected to a position between the terminal blocks DA and DB of this slave station to set the station to the end station.

When connecting a resistor purchased on the general market, perform the insulation process so that the lead wires of the resistor are not in contact with each other (short-circuit).



CAUTION :

- If the switch is set with the power “ON”, the setting contents may not be recognized. Set the switch always with the serial transmission unit block power “OFF”.
- Set the terminal resistance correctly, referring to the “Master Station” User’s Manual. If the terminal resistance value and connection method are mistaken, there is a possibility that communication errors may occur.
- In connecting the externally mounted terminal resistor at the outside, be sure to turn the terminal station setting “OFF”.
- Where the externally mounted terminal resistance is connected at the outside, proper insulation is required to prevent the resistor lead wire from contact (short-circuit).



3.2 Correspondence between Output Nos. and internal connector Nos.

Those Numbers correspond as per table, posted below.

<div>Triangle ▽</div>																																			
⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳																										
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩																										

● For double solenoid valve

	Connector pin No.															
	0(1)	1(2)	2(3)	3(4)	4(5)	5(6)	6(7)	7(8)	8(11)	9(12)	A(13)	B(14)	C(15)	D(16)	E(17)	F(18)
1st station	○	●														
2nd station			○	●												
3rd station					○	●										
4th station							○	●								
5th station									○	●						
6th station											○	●				
7th station													○	●		
8th station															○	●
Symbol	○ Solenoid (a) side / ● Solenoid (b) side															

(Correspond with up the 8th solenoid valve.)

● For mixed(single and double) solenoid valve

	Connector pin No.															
	0(1)	1(2)	2(3)	3(4)	4(5)	5(6)	6(7)	7(8)	8(11)	9(12)	A(13)	B(14)	C(15)	D(16)	E(17)	F(18)
1st station	○															
2nd station		○														
3rd station			○	●												
4th station					○	●										
5th station							○									
6th station								○								
7th station									○	●						
8th station											○					
Symbol	○ Solenoid (a) side / ● Solenoid (b) side															

(Correspond with up the 8th solenoid valve.)

- 3) Output pin No. sometime become vacant depending upon manifold valve block number due to the sequential wiring. Such vacant pin is not available to be used for driving any other equipment.

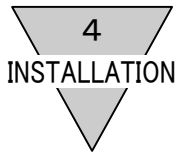
3.4 Programming

This slave station unit is seen as a 16-point output unit constituting 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).

Functions particular to this slave station unit are the specification of the state of output during an error and the declaration of the end station. These functions, however, need not be taken into consideration when you create a program. This slave station unit has a function for informing the master station of the breaking of fuse in the power source for the solenoid valve system. The program can detect a breaking of the fuse or the availability (ON/OFF) of the power source for the solenoid valve system by referring to the state of a bit in the registers listed below. (The position of the bit to be referred to depends on the station number.)

Special link register	Name	Function
SW0088 (688H) • SW0089 (689H) • SW008A (68AH) • SW008B (68BH)	Remote station fuse breaking registers	The registers store information about the state of fuses in different stations. 0 : Normal 1 : Burnt

※ With the master station unit AJ61BT11 or A1SJ61BT11 only



4. INSTALLATION

4.1 Wiring

It is required to connect signal circuit with power line to make this model T6G1 function. Erroneous connection causes 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.

1) Specifications of twist pair cable (communication line)

The table below illustrates the twist pair cable 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.

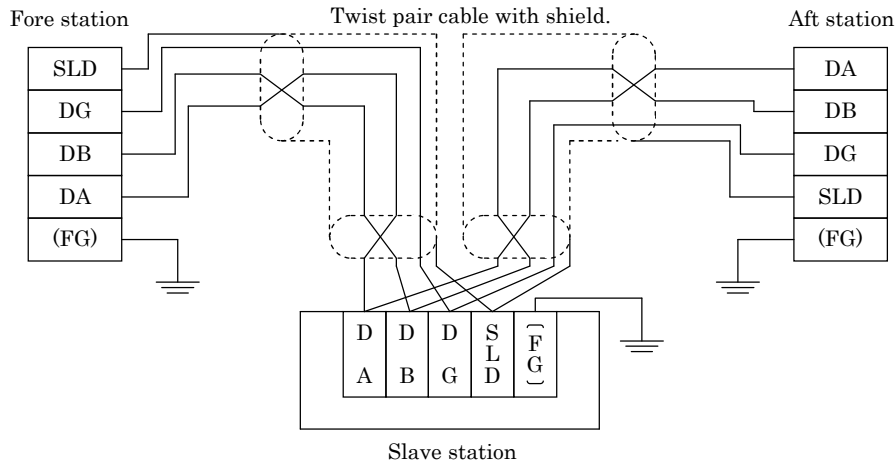
Item	Specifications	
	Cable exclusively for CC-Link	High-performance cable exclusively for CC-Link
Name	FANC-SB	FANC-SBH
Manufacturer	Kuramo Denko Co., Ltd.	
Kind of cable	Twist pair cable with shield	
Conduit sectional area	0.5mm ²	
Conduit resistance (20°C)	37.8Ω / km or less	
Insulation resistance	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 weight	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 or contact the cable manufacturer.

2) Wiring of twist pair cable

When connecting a twist pair cable to this slave station unit, connect the DA (blue), DB (white), and DG (yellow) wires in the cable to the DA, DB, and DG terminals respectively, and connect the shield jacket to the SLD terminal. Ground the FG terminal without fail (grounding resistance 100 ohms or less).

An example of cable connections is given below.



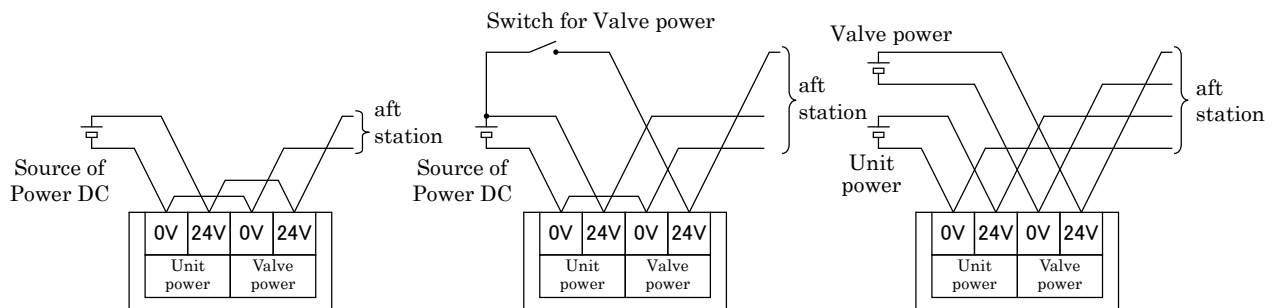
Note : This slave station unit (OPP3-1G) does not use two-piece type terminal blocks. The data links, therefore, have to be shut down when you replace the slave station unit.

If you wish to replace a slave station unit that constitutes the end station and a terminal resistor is connected with it, you will have to connect the terminal resistor to the station positioned before the end station before you disconnect the end station for replacement.

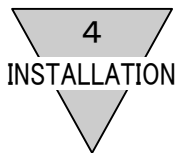
3) Wiring the source of power

The power circuit for the slave station unit (OPP3-1G) can be isolated from the power circuit for the solenoid valve system. Moreover, two separate power sources can be used to supply power independently to the slave station unit and the solenoid valve system. The illustrations below are examples of power supply to two or more slave stations (remote I/O units) from power source(s) at a single location. You may try other variations as required.

- ① Common connection of Unit power and Valve power ② Wiring to enable Valve power to be turned On · Off. ③ Seperate connection Unit power with Valve power



NOTE : 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.



4) Cautions for wiring

To avoid any troubles caused by noise, strictly observe the following cautions when performing the wiring.

- (1) If the noise may affect adversely, prepare the power supply for each manifold solenoid valve where possible and perform the wiring individually.
- (2) Do not use a long power cable if it is not necessary. Make the wiring distance as short as possible.
- (3) Do not connect devices producing noise, such as inverter or motor to the same power supply for the manifold solenoid valve.
- (4) Do not connect the power supply and signal cables in parallel to other power cables.



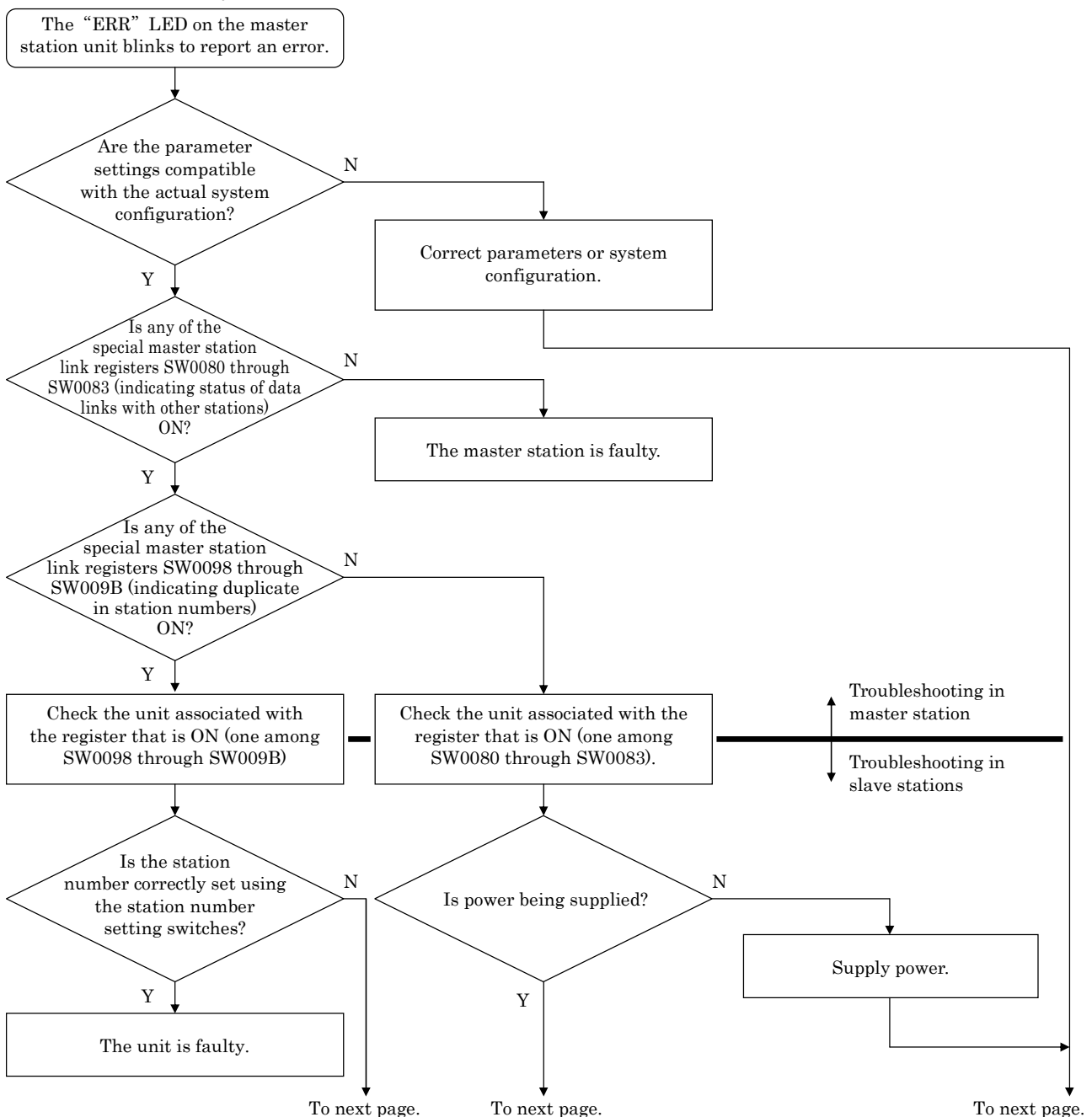
CAUTION :

- Since connecting the electric wires that were only twisted direct to the terminal strip may cause firing, be sure to use a crimp terminal.
- Connect the power supply always after checking the polarities of serial transmission unit block terminal and cable terminal.
- Before selecting the power cable, always calculate the current consumption.
- Where the power is supplied to several serial transmission unit blocks and remote stations from a single power source, cable selection and wiring are required with due consideration given to voltage drop caused by the electric wire.
- When such voltage drop is unavoidable, pluralize the power lines, provide another power source, and take other measures therefor, and also maintain the power supply voltage as specified.

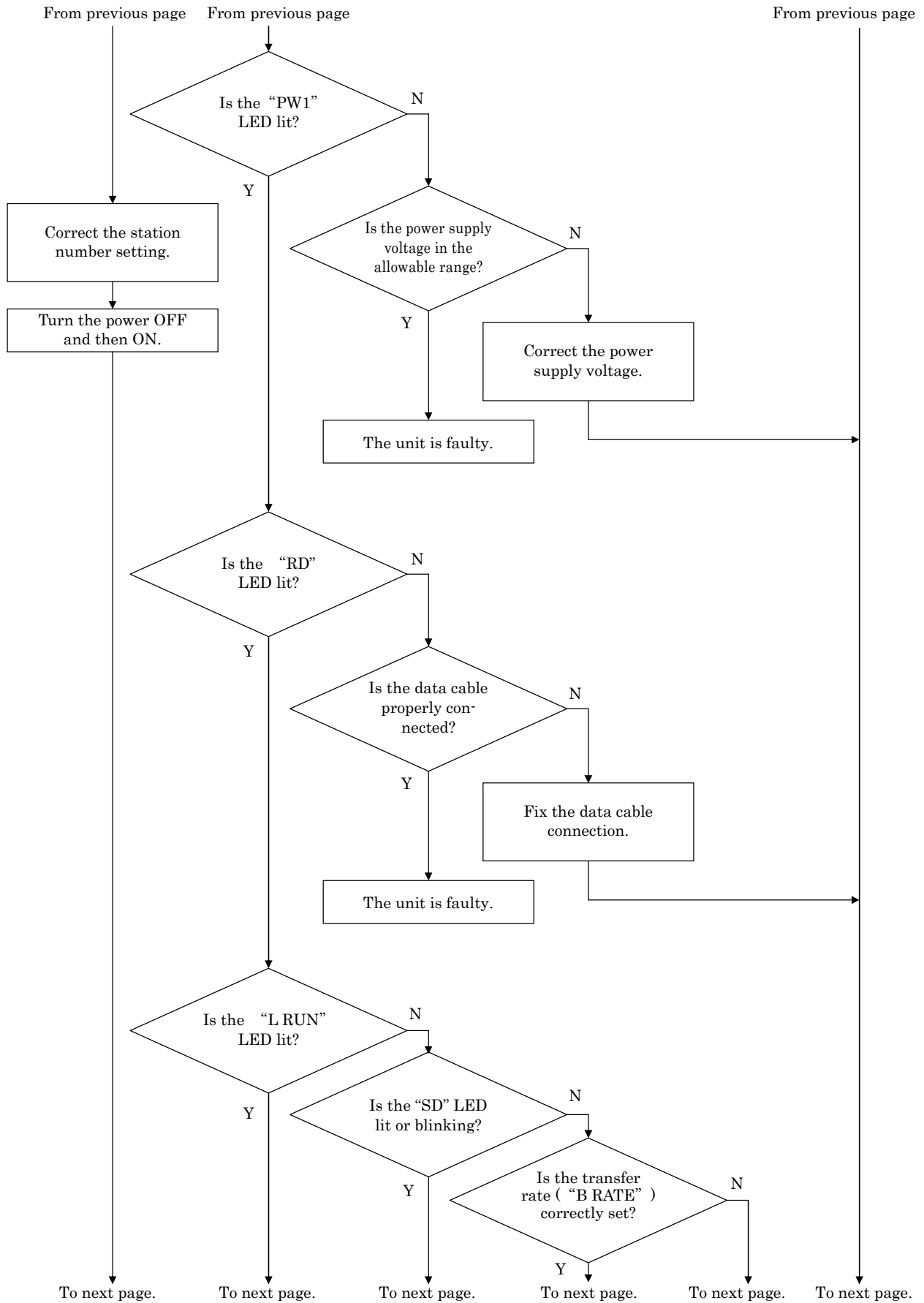
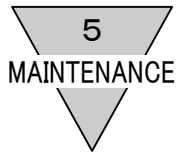
5. MAINTENANCE

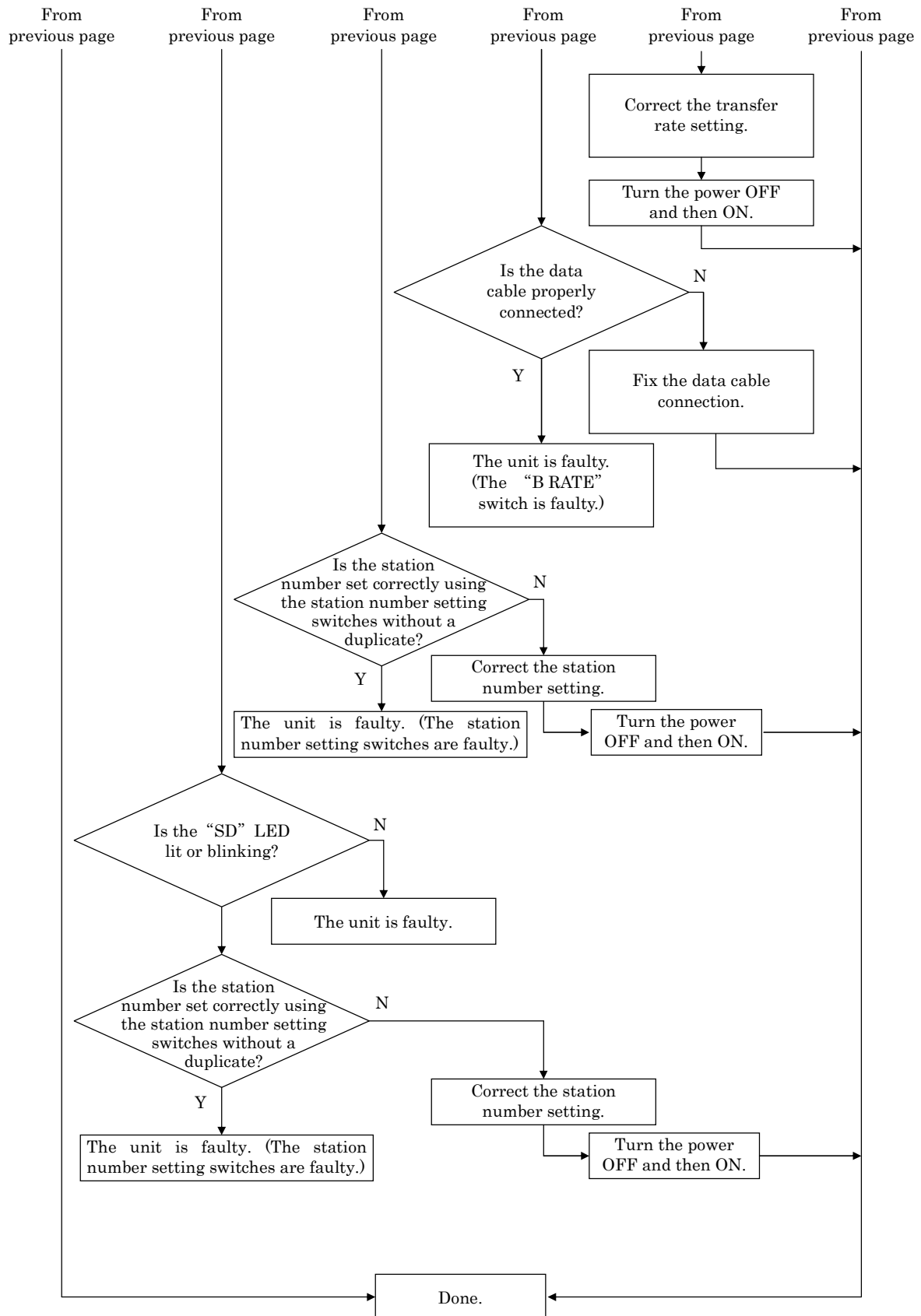
5.1 Troubleshooting

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). The “PW2” LED is particular to this slave station unit. If only this LED has gone off, check the voltage of the power supplied to the solenoid valve system and note if the fuse has blown

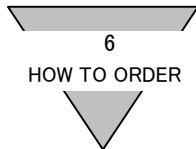


Discontinue





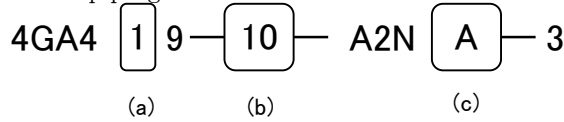
Discontinue



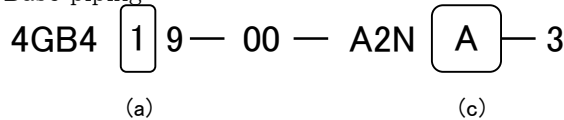
6. How to order

1) Individual valve for manifold base

• Direct piping

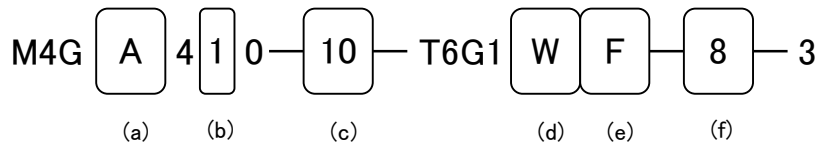


• Base piping



(a) Solenoid position		(b) Port size		(c) Option	
Symbol	Description	Symbol	Description	Symbol	Description
1	2-position single solenoid	C8	φ 8 push-in joint	Blank	none
2	2-position double solenoid	C10	φ 10 push-in joint	K	External pilot
3	3-position all ports closed	C12	φ 12 push-in joint	A	Coolant proof
4	3-position ABR connection	10	Rc3/8	F	A/B port filter integrated ※1
5	3-position PAB connection	10G	G3/8	※1 4GA4 only	
		10N	NPT3/8		

2) Reduced wiring type manifold T6G1 (Serial transmission type)



(a) Piping direction		(b) Solenoid position		(c) Port size (A/B port)		(d) Terminal/connector pin array	
Symbol	Description	Symbol	Description	Symbol	Description	Symbol	Description
A	Valve top direction	1	2-position single solenoid	C8	φ 8 push-in joint	Blank	Standard wiring
B	Sub-base side porting	2	2-position double solenoid	C10	φ 10 push-in joint	W	Double wiring
		3	3-position all ports closed	C12	φ 12 push-in joint		
		4	3-position ABR connection	CX	Push-in joint mixed		
		5	3-position PAB connection	08	Rc1/4 ※2		
				08G	G1/4 ※2		
				08N	NPT1/4 ※2		
				10	Rc3/8		
				10G	G3/8		
				10N	NPT3/8		
				15	Rc1/2 ※2		
				15G	G1/2 ※2		
				15N	NPT1/2 ※2		

(e) Option		(f) Station number	
Symbol	Description	Symbol	Description
Blank	none		
K	External pilot		
A	Coolant proof		
F	A/B port filter integrated	2	2 stations
Z1	Supply spacer	~	~
Z3	Exhaust spacer		
Q	Supply and exhaust block	8	8 stations

※2 M4GB4 only

See also the catalog (No.CB-023S-8) for further information.