Discontinue

CKD

SM-P00046-A

INSTRUCTION MANUAL

PILOT TYPE 3,5 PORTS ELECTRIC-MAGNETIC VALVE

(M)3GD/E1-SERIES
(M)3GD/E2-SERIES
(M)3GD3-SERIES
(M)4GD/E1-SERIES
(M)4GD/E2-SERIES
(M)4GD/E3-SERIES

- **Individual sub base type**
- **Manifold type**

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

2ND EDITION

CKD Corporation

Safety precautions

When designing and manufacturing a device using CKD products, the manufacturer is obligated to manufacture a safe product by confirming safety of the system comprising the following items:

- Device mechanism
- Pneumatic or water control circuit
- Electric control that controls the above

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

⚠ WARNING

1. This product is designed and manufactured as a general industrial machine part. It must be handled by someone having sufficient knowledge and experience.

2. Use this product within its specifications.

This product cannot be used beyond its specifications. Additionally, the product must not be modified or machined.
This product is intended for use in general industrial devices and parts. Use beyond such conditions is not considered. Consult with CKD for details when using the product beyond the unique specification range, outdoors, or in the following conditions or environments. In any case, measures for safety shall be provided when the vavle malfunctions.

① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
② Use for applications where life or assets could be adversely affected, and special safety measures are required.

3. Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

SO4414, JIS B 8370 (pneumatic system rules)
JFPS2008 (principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, standards and regulations, etc.

4. Do not handle, pipe, or remove devices before confirming safety.

① Inspect and service the machine and devices after confirming safety of the entire system related to this product.
② Note that there may be hot or charged sections even after operation is stopped.
③ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Release any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
④ When starting or restarting a machine or device that incorporates pneumatic components, make sure that system safety, such as pop-out prevention measures, is secured.

5. Observe warnings and cautions on the pages below to prevent accidents.

■The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

DANGER :When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

WARNING :When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

CAUTION :When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Precautions with regard to guarantee

- **Guarantee period**

The guarantee period of our product shall be one (1) year after it is delivered to the place specified by the customer.

- **Guarantee coverage**

If any failure for which CKD CORPORATION is recognized to be responsible occurs within the above warranty period, a substitute or necessary replacement parts shall be provided free of charge, or the product shall be repaired free of charge at the plant of CKD CORPORATION.

However, the guarantee excludes following cases:

① Defects resulting from operation under conditions beyond those stated in the catalogue or specifications.
② Failure resulting from malfunction of the equipment and/or machine manufactured by other companies.
③ Failure resulting from wrong use of the product.
④ Failure resulting from modification or repairing that CKD CORPORATION is not involved in.
⑤ Failure resulting from causes that could not be foreseen by the technology available at the time of delivery.
⑥ Failure resulting from disaster that CKD is not responsible of.

Guarantee stated here covers only the delivered products. Any other damage resulting from failure of the delivered products is not covered by this guarantee.

- **Confirmation of product compatibility**

Our customer shall be responsible of confirming compatibility of our product used in our customer's system, machinery or device.

UNPACKING (Chapter 3.)

⚠ CAUTION : Bags containing solenoid valves should be opened only when you are ready to connect the valves to the pipes immediately afterward.

- If bags are opened before the valves are ready to be connected to the pipes, the entry of foreign matter from the piping ports could cause the solenoid valves to fail or malfunction.

INSTALLATION (Chapter 4.)

⚠ CAUTION : If you have to use the product under conditions that are different from the specified conditions or if you intend to use the product for a special application, be sure to consult us about the product specifications before using the product.

INSTALLATION ENVIRONMENT (Section 4.1.)

⚠ CAUTION :

a) In a dusty environment, foreign matter may enter even through the exhaust port.

- The movement of the solenoid valve causes a respiratory action at the exhaust port, which may cause inhalation of foreign matter around the exhaust port. This potential situation would be worse if the exhaust port is facing upward. Attach a silencer to the exhaust port or have the exhaust port face downward.

b) Do not keep water or coolant dripping to the solenoid valve system constantly.

- In case that the solenoid valve system is used under the conditions with constant water splash, protect it by a cover or install it inside a enclosure.
- If the cylinder rod is splashed with cutting oil, the oil may penetrate through the cylinder into the secondary side piping of the solenoid valve. This must be prevented to avoid malfunctions. Consult us for preventive measures.

c) The coils will produce heat.

- Particularly if the solenoid valve system is installed in a control board or if the solenoid coils need to be energized for a long time, consider providing sufficient ventilation to release the heat. The coils can get very hot.

d) Do not use the solenoid valve system in an atmosphere that includes a corrosive gas such as the sulfur dioxide gas or solvent vapors.

e) Vibrations and shocks
Do not subject the solenoid valve system to vibrations 50m/s^2 or stronger or shocks 300m/s^2 or stronger.

f) Do not use the normal type solenoid valves for an application that requires conformity with explosion-proof specifications. Choose explosion-proof solenoid valves instead.

INSTALLATION (Section 4.2.)

⚠ WARNING : When installing a solenoid valve unit, never attempt to hold it in position by means of the pipes connected to it.

- Fix the solenoid valve by applying the mounting screws and/or mounting plate to the solenoid valve.

⚠ CAUTION : When mounting this product on the DIN rail, check the strength

- If the strength is insufficient, mount the manifold base directly.

PIPING (Section 4.3.)

⚠ CAUTION :

a) Observe the recommended tightening torque when connecting pipes.
- Observing the recommended tightening torque prevents air leakage and damage to the screw threads. To prevent damage to the screw threads, first use your hand to lightly tighten the screw and then use a tool to tighten the screw to the recommended torque.

b) Make sure that the pipes will not be disconnected at the joints by mechanical movements, vibrations or tension.
- If the exhaust piping of the pneumatic circuit is disconnected, the actuator speed control is disabled.
- If the above happens to a chuck holding mechanism, the chuck will open. The inadvertent opening of the chuck may cause a serious accident.

c) When supplying the compressed air for the first time after completing the piping, be sure to check every joint in the piping for air leakage.

d) When supplying the compressed air for the first time after completing the piping, increase the air pressure gradually but never introduce a highly-pressurized air suddenly.
- A sudden introduction of a highly-pressurized air may disconnect pipes at joints and/or cause the tubes to jump around, any of which may cause an injury.

e) Do not decrease the inside diameter of the piping from any of the solenoid valve exhaust ports to a diameter less than the exhaust pipe connecting port size.
- Normal operation of the actuator depends on the smoothness of the exhaust flow. With a manifold system, a restriction to the exhaust flow may prevent normal operation of other solenoid valves.

f) Removal of foreign matter
- Rust and other foreign matter in the pneumatic circuit may cause a malfunction or leakage from the valve seat. Insert a filter (maximum allowable particle size 5μm or less) immediately upstream of the solenoid valve.

g) Air supply

Do not restrict the flow of air through the air supply piping. With a manifold system with multiple stations, a drop in the air supply pressure may cause trouble through a delay in the operation timing.

WIRING (Section 4.4.)

⚠ WARNING :

When carrying out electrical connections, please perform disassembling and assembling work after reading the Instruction Manual carefully and with full understanding of its contents.
- Your understanding of the structure of solenoid valve and its operation principle is required in order to secure the safety.

⚠ CAUTION :

Before supplying the power, check the power supply voltage and the current type (AC or DC).

MANUAL OPERATION (Section 5.2.)

⚠ WARNING :

a) After using the manual override, be sure to reset the manual override to the original (OFF) position before resuming the operation of the device.
b) Before using the manual override, make sure that nobody is present near the cylinder to be activated.
c) After an operation, be sure to release the lock to turn the manual override OFF.
The lock is released (the manual override turned OFF) if the manual override protection cover is closed.

AIR QUALITY (Section 5.3.)

⚠ WARNING :

a) Do not supply anything other than compressed air.
b) Supply clean compressed air without any mixture of corrosive gas.

⚠ CAUTION :

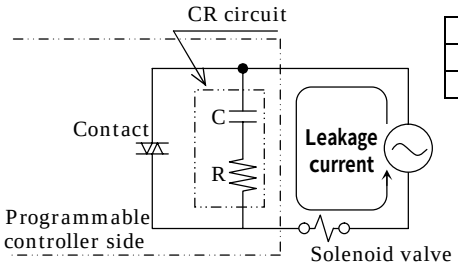
a) Compressed air usually contains a large amount of drain, oxidized oil, tar, foreign matter, and rust from the piping. Filter out those elements in the supplied air because they may cause a malfunction and decrease service life. In addition, clean the exhaust before it is released to the air to minimize pollution.
b) Once you have lubricated a pre-lubricated valve, the valve is no longer capable of running without being lubricated from the outside. Do not leave the valve without lubrication. Keep it lubricated.
c) Do not use spindle oil or machine oil. They induce expansion of the rubber parts, which will cause malfunction.

ELECTRIC CIRCUIT (Section 5.4.)

⚠ CAUTION :

a) Check for the presence of any current leak from the external control device because it may cause malfunction.
- When a programmable controller or a similar control device is used, a current leak may prevent the normal returning of the valve when the solenoid is de-energized.

b) Restriction on current leak
- When controlling solenoid valves using a programmable controller or a similar control device, make sure that the current leak in the programmable controller output is equal to or less than the level shown in the table below. A current leak larger than the allowable level may cause malfunction.



AC100V	2.0 mA or less
DC12V	1.5 mA or less
DC24V	1.8 mA or less

PERIODIC INSPECTION (Section 6.1.)

⚠ WARNING :

Before providing maintenance service, cut the power and the supply of compressed air and confirm the residual pressure is released.
- The above is required to ensure safety.

⚠ CAUTION :

Regularly perform the daily and periodic inspections to correctly maintain product performance.
- If the product is not correctly maintained, product performance may deteriorate dramatically, resulting in a shorter service life, fractures of components, and malfunctions.

DISASSEMBLY AND ASSEMBLY (Section 6.2.)

⚠ WARNING :

Before increase or decrease block of manifold, cut the power and the supply of compressed air.

⚠ WARNING :

Please avoid disassembling and reassembling the solenoid valve, otherwise the sealing and drip proof performance may deform.
- Disassembled and Reassembled product by the customer will not be guaranteed.

ADDITIONAL INSTALLATION OF A VALVE UNIT TO A REDUCED WIRING TYPE MANIFOLD (Section 6.3.)

⚠ WARNING :

When disassembling or assembling the manifold, perform it after reading the Instruction Manual carefully and with full understanding of its contents.
- You are required to understand the structure of solenoid valve and its operation principle to secure the safety.
- A level of 2nd Class or more of Pneumatics Technology Certification is required.

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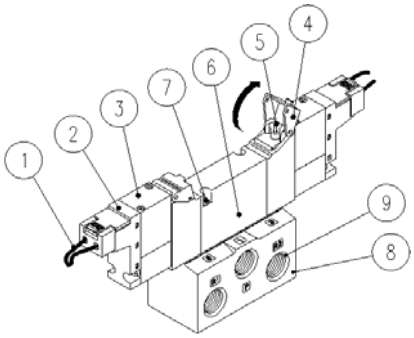
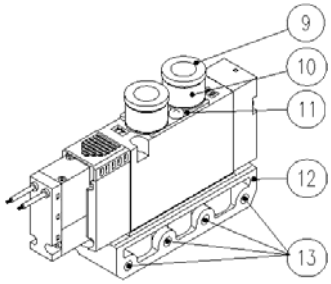
(M)3GD/E1 , (M)3GD/E2 , (M)3GD3
(M)4GD/E1 , (M)4GD/E2 , (M)4GD/E3
Pneumatic 3,5-port solenoid valve
Instruction Manual No. SM-P00046-A

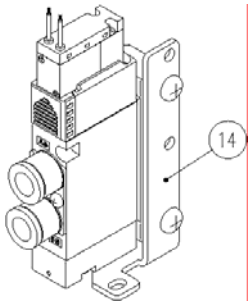
1. PRODUCT



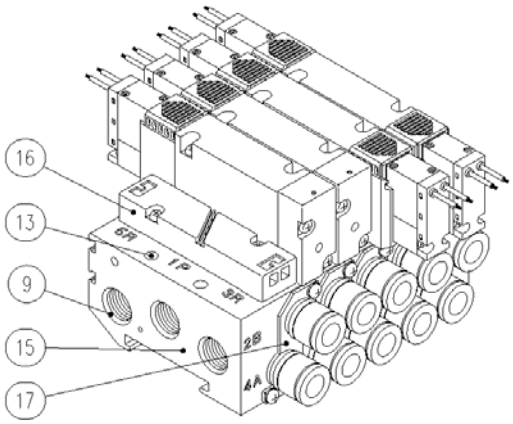
base porting type



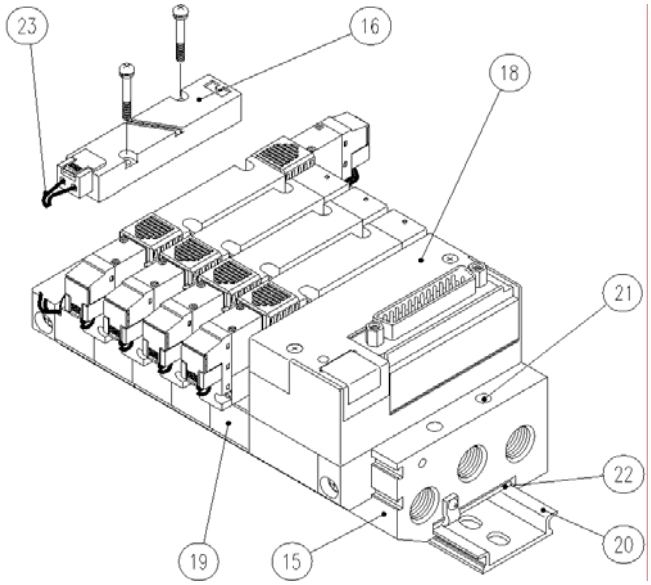
body porting type



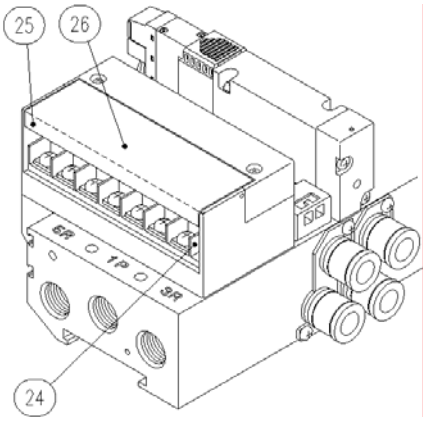
Mounting plate



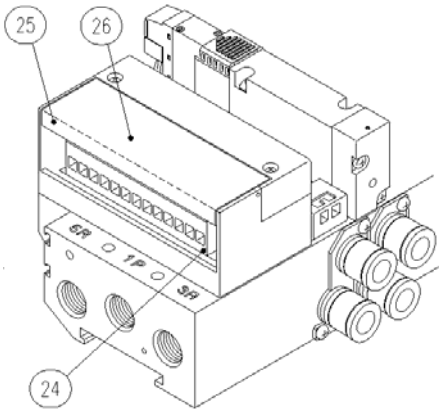
Individual wiring type manifold



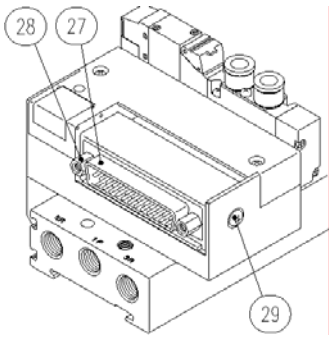
Reduced wiring type manifold
(The sketch shows DIN rail mount type)



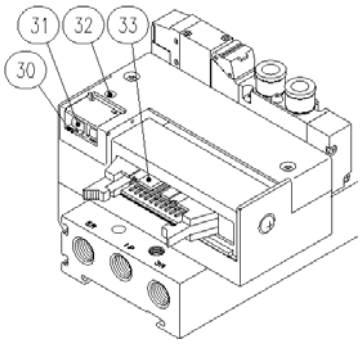
Common terminal stand(T10)
M3 thread type



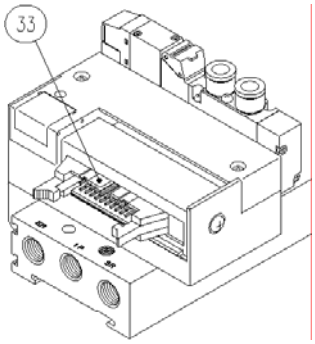
Common terminal stand(T11)
Push-in fitting type



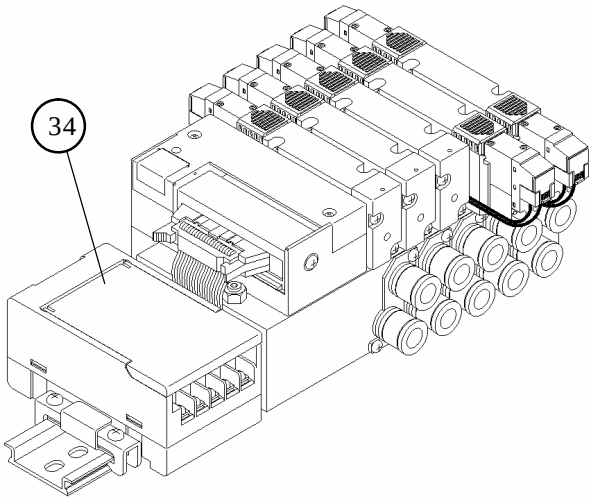
D-sub connector(T30)



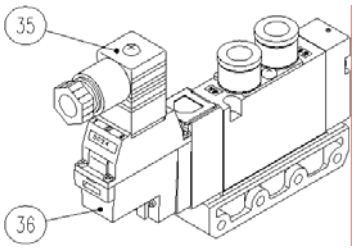
Flat cable connector(T50)



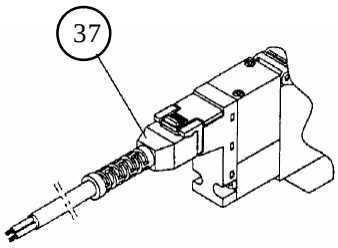
Flat cable connector (T51)



Serial transmission slave unit (T6*)



DIN terminal box(B)



Socket with cover(E*J)

No.	名　　称	説　　明
1	Lead wire	No specification about the polarities.
2	Electric component cover	The green power indicator light on the top surface is lit when the power is surplied to the coil. (With E-type and A-type connectors only.)
3	Coil assembly	It varies depending on electric wire connection type and voltage. This part is not compatible with No.35.
4	Manual override protection cover	The protection cover prevents accidental operation of the manual ovveride. The user must open the cover before operating the manual override.
5	Manual override	Allows a non-lock type operation (push and release) as well as a lock type (push and lock) operation.
6	Individual valve	
7	Individual valve mounting screw	Two screws are provided for each individual valve so as to fix the individual valves to various bases.
8	Sub plate	In case of an individual specification, assemble this sub base.
9	Piping port	“1(P)”, “3(R2)/5(R1)”, and “2(B)/4(A)” show the supply, exhaust, and output ports, respectively.
10	Joint	A replaceable cartridge type one-touch joint.
11	Stopper plate	Secures cartridge type joints or like. This part is not compatible with No.17.
12	Piping adaptor	Supplied attached to the body porting individual valve.
13	Mounting hole	For direct mounting
14	Mounting plate	Used for vertical mounting of the body porting individual valve.
15	manifold base	
16	Masking plate	Removed when an additional valve unit is installed.
17	Joint stopper plate	Secures cartridge type joints or like. This part is not compatible with No.11.
18	Electric component block	Includes and secures a printed circuit board with intermediate connectors.
19	Wiring cover	Protects the cables inside. Keep the cover closed when using the valves.
20	DIN rail	
21	DIN rail mounting screw	Fix the entire manifold in place on the DIN rail. One holder is used at each of the two ends of the base.
22	Holder	The holders are used together with the DIN rail mounting screw.(With 4G2/4G3 only)
23	Spare cable	For additional valve installation.
24	Terminal block	A set of terminals to control the valves mounted on the manifold.
25	Cover	Can be opened when wiring. To avoid electric shock, be sure to close it before energization.
26	Indicates the layout of the terminal stand	Terminal block layout drawing Indicates the layout of the terminal block. Paper can be removed for use as a TAG for taking notes.
27	D-sub 25-pin connector	Locks the mating connector (M2.6).
28	Mounting screw	Loosened to allow changing the direction for leading out the connected cable; tightened to lock the direction.
29	The screw for detent	Loosened to allow changing the direction for leading out the connected cable; tightened to lock the direction.
30	Power terminal block	Used when an external power supply is required.
31	Power polarity marking	
32	Power indicator light	Lit when the power is supplied with right polarities.
33	Flat cable connector	A set of terminals to control the valves mounted on the manifold.
34	Serial transmission slave unit	This is a slave station dedicated to a CKD-made manifold.
35	DIN terminal box	A green power indicator lamp is lit while the solenoid is energized.
36	Coil assembly	This coil assembly is for the DIN terminal box type only. This part is not compatible with No.3.
37	Socket with cover	Comes with a covered cabtyre cable; can be used with the E-type connector.

2. PORT INDICATION AND SI UNIT SYSTEM

2.1 Port Indication

Each piping port is marked with ISO and JIS conformable piping port indication codes.

Application	ISO	JIS
Supply port	1	P
Output port	4	A
Output port	2	B
Exhaust port	5	R1
Exhaust port	3	R2

- Installing position of the solenoid valve is free. The position of the 4(A) and 5(R1) ports for 4G series are in reverse with 2(B) and 3(R2) ports respectively, compared with the 4K series. To avoid malfunction, please confirm the port symbol before piping.

2.2 Conversion between SI unit and Conventional Units

In this manual, values are expressed using the International System of Units (SI).
Use the table below to convert them into values expressed in conventional units.

Table of conversion between SI units and conventional units
(The values printed in Bolds fonts are values given in the International System of Units (SI)):

Example (converting a pressure value):
1kgf/cm^2 → **0.980665Mpa**　　**1MPa** → 1.01972×10kgf/cm^2

- Force

N	dyn	kgf
1	1×10^{5}	1.01972×10^{-1}
1×10^{-5}	1	1.01972×10^{-6}
9.80665	9.80665×10^{5}	1

- Stress

Pa or N/m^2	MPa or N/mm^2	kgf/mm^2	kgf/cm^2
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10
9.80665×10^{6}	9.80665	1	1×10^{2}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1

*: 1Pa=1N/m^2, 1MPa=1N/mm^2

- Pressure

Pa	kPa	MPa	bar	kgf/cm^2	atm	mmH2O	MmHg or Torr
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}	9.86923×10^{-6}	1.01972×10^{-1}	7.50062×10^{-3}
1×10^{3}	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}	9.86923×10^{-3}	1.01972×10^{2}	7.50062
1×10^{6}	1×10^{3}	1	1×10	1.01972×10	9.86923	1.01972×10^{5}	7.50062×10^{3}
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.01972	9.86923×10^{-1}	1.01972×10^{4}	7.50062×10^{2}
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	1	9.67841×10^{-1}	1×10^{4}	7.35559×10^{2}
1.01325×10^{5}	1.01325×10^{2}	1.01325×10^{-1}	1.01325	1.01323	1	1.03323×10^{4}	7.60000×10^{2}
9.80665	9.80665×10^{-3}	9.80665×10^{-6}	9.80665×10^{-5}	1×10^{-4}	9.67841×10^{-5}	1	7.35559×10^{-2}
1.33322×10^{2}	1.33322×10^{-1}	1.33322×10^{-4}	1.33322×10^{-3}	1.35951×10^{-3}	1.31579×10^{-3}	1.35951×10	1

*1Pa=1N/m^2

3. UNPACKING

> **⚠ CAUTION :** Bags containing solenoid valves should be opened only when you are ready to connect the valves to the pipes immediately afterward.
> - If bags are opened before the valves are ready to be connected to the pipes, the entry of foreign matter from the piping ports could cause the solenoid valves to fail or malfunction.

a) Check the model number imprinted on the product to make sure that the product you received is exactly the product you ordered.
b) Check the exterior of the product for any damage.
c) Before using the product, read the supplied documentation.

4. INSTALLATION

⚠ CAUTION : If you have to use the product under conditions that are different from the specified conditions or if you intend to use the product for a special application, be sure to consult us about the product specifications before using the product.

4.1 Installation environment

⚠ CAUTION :

a) In a dusty environment, foreign matter may enter even through the exhaust port.
- The movement of the solenoid valve causes a respiratory action at the exhaust port, which may cause inhalation of foreign matter around the exhaust port. This potential situation would be worse if the exhaust port is facing upward. Attach a silencer to the exhaust port or have the exhaust port face downward.

b) Do not keep water or coolant dripping to the solenoid valve system constantly.
- In case that the solenoid valve system is used under the conditions with constant water splash, protect it by a cover or install it inside a enclosure.
- If the cylinder rod is splashed with cutting oil, the oil may penetrate through the cylinder into the secondary side piping of the solenoid valve. This must be prevented to avoid malfunctions. Consult us for preventive measures.

c) The coils will produce heat.
- Particularly if the solenoid valve system is installed in a control board or if the solenoid coils need to be energized for a long time, consider providing sufficient ventilation to release the heat. The coils can get very hot.

d) Do not use the solenoid valve system in an atmosphere that includes a corrosive gas such as the sulfur dioxide gas or solvent vapors.

e) Vibrations and shocks
Do not subject the solenoid valve system to vibrations 50m/s^2 or stronger or shocks 300m/s^2 or stronger.

f) Do not use the normal type solenoid valves for an application that requires conformity with explosion-proof specifications. Choose explosion-proof solenoid valves instead.

4.2 Installation

⚠ WARNING : When installing a solenoid valve unit, never attempt to hold it in position by means of the pipes connected to it.
・Fix 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.
・If the strength is insufficient, mount the manifold body directly.

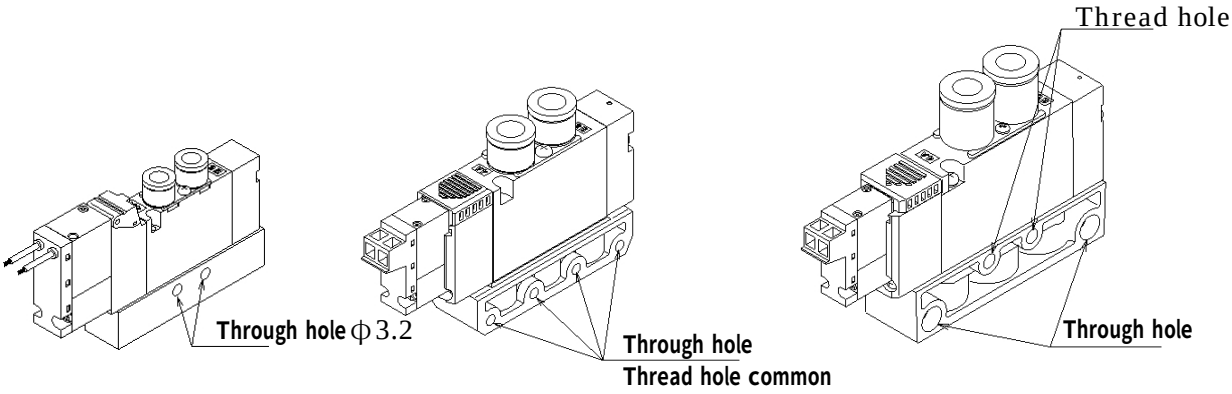
Please secure enough space around the solenoid valve for mounting, dismounting and piping work.

4.2.1 How to install body porting individual valve

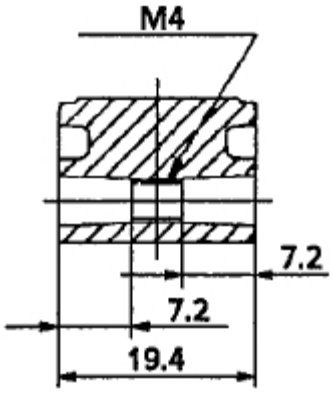
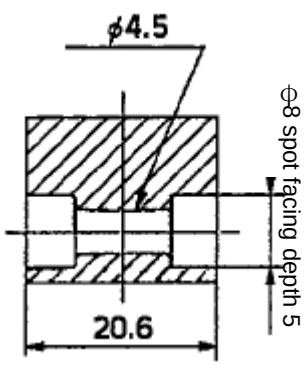
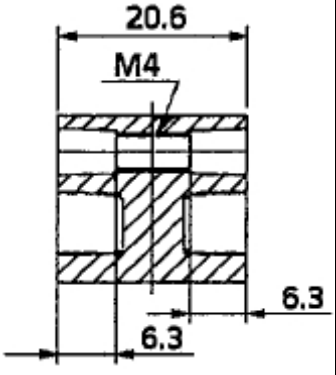
1) For direct mount

For body porting individual valve 4GD2/4GD3 series, through hole or internal thread hole is available for installation. If a screw hole is used, recommended tightening torque is 0.7 - 1.2N・m. (For the 4GD1 series, through holes only)

●4GD1 Series ●4GD2 Series ●4GD3 Series



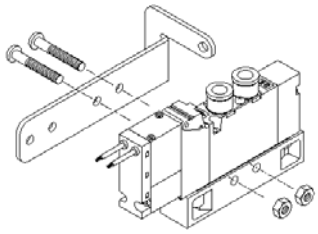
Mounting hole shape

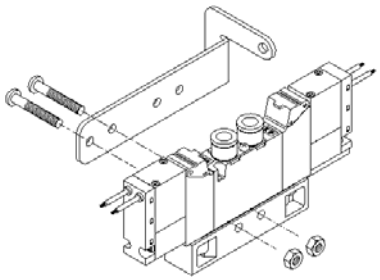
	4GD2 Series	4GD3 Series	
	Through hole thread hole common	Through hole	Thread hole
Mounting hole sectional view			

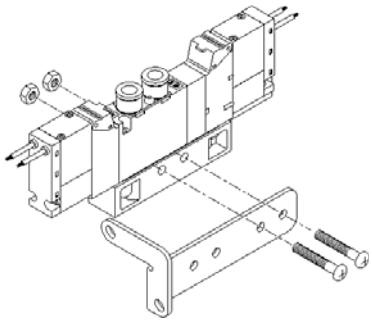
2) How to install Mounting plate(Option "P")

For mounting plate of body porting individual valve, installation method may differ depending on single, double or 3-position. Incorrect installation may cause failures. For DIN terminal box type, it is restricted to the single solenoid type.

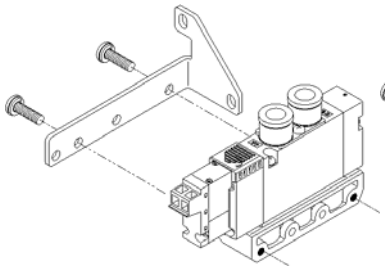
●4GD1 Series

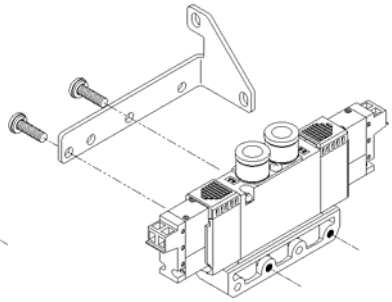

5(R1) side

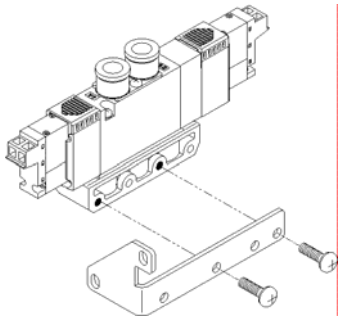

5(R1) side


5(R1) side

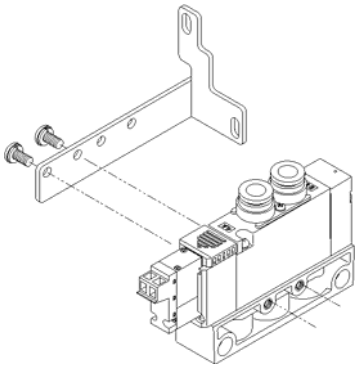
●4GD2 Series

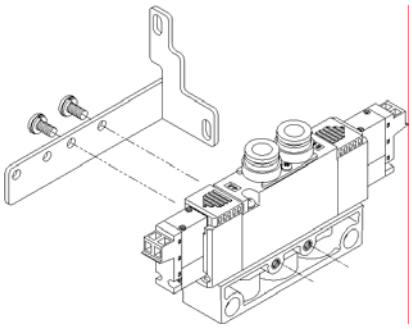

5(R1) side

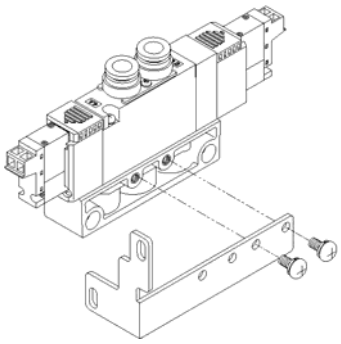

5(R1) side


5(R1) side

●4GD3 Series

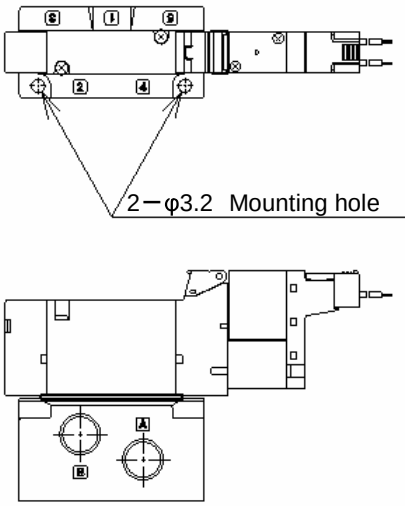

5(R1) side


5(R1) side

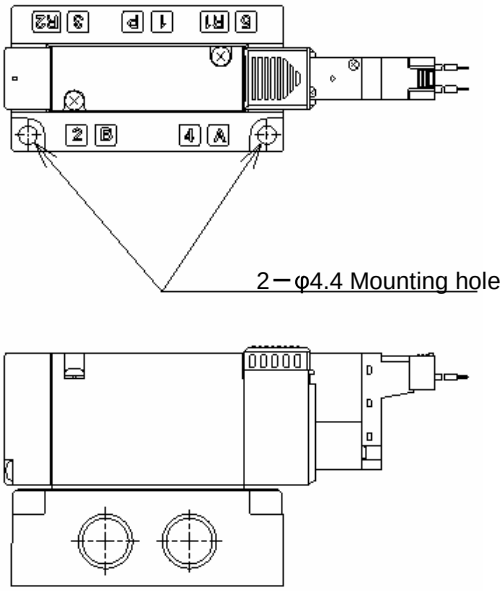

5(R1) side

4.2.2 Mounting method of individual valve sub base type

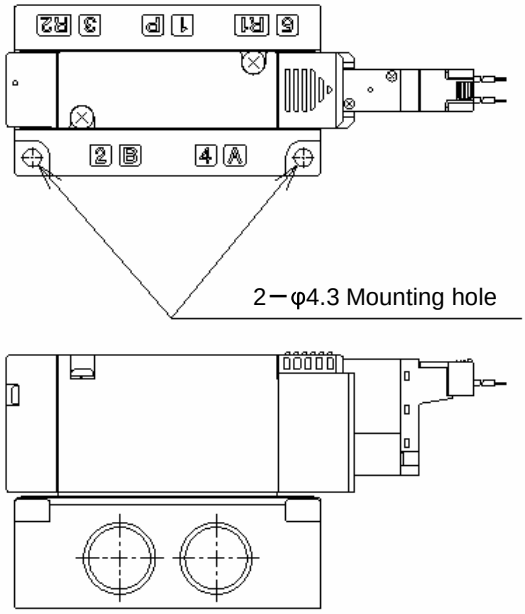
●4GE1 Series



●4GE2 Series



●4GE3 Series

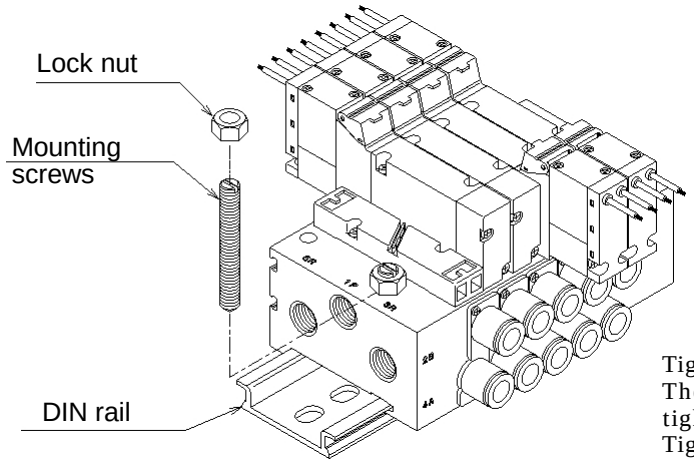


4.2.3 How to install manifold

1) How to install DIN rail

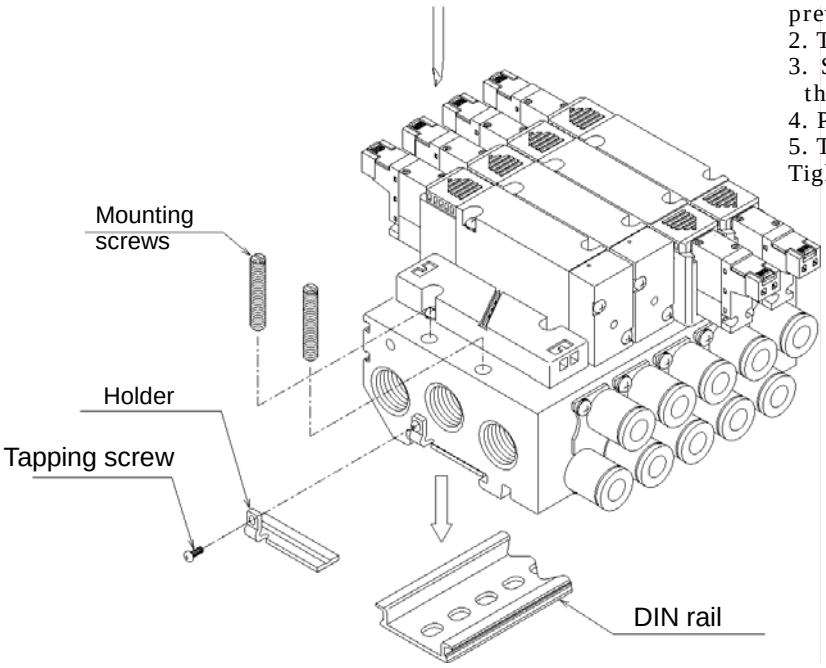
A DIN rail mounting type manifold (Option symbol “D”) or a direct mounting type manifold which is modified using the DIN rail kit can be mounted on the DIN rail. If not mounted correctly, this may cause the manifold to drop or be damaged. Carefully check this point. Fix the DIN rail on the mounting surface at intervals of 50 mm when using it under the environment of vibration or impact. Before starting the operation, make sure that the installation status is correct.

●M4G1 Series



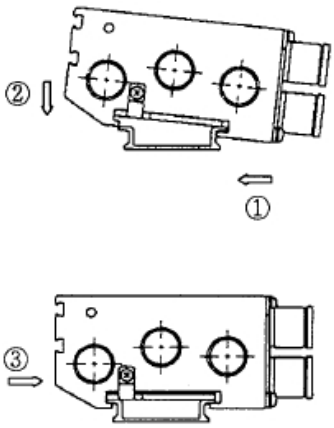
Tighten the lock nut.
The DIN rail could deform if the tightening torque is too high.
Tightening torque 0.3 to 0.7 N･m

●M4G2 / M4G3 Series



1. Mounting the holder
(The tapping screw is tightened to prevent dropping off.)
2. Temporarily tighten set screw.
3. Set the jaws onto the DIN rail in the order of (1) and (2).
4. Press in the direction of (3).
5. Tighten the set screw.

Tightening torque 0.7 to 1.0 N･m

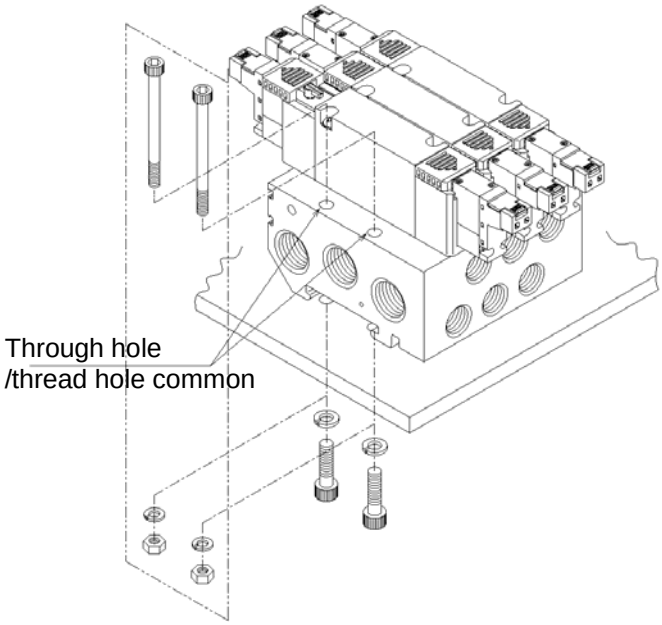


2) For direct mount

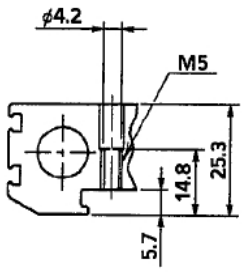
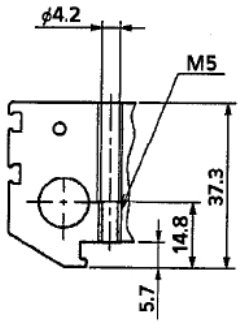
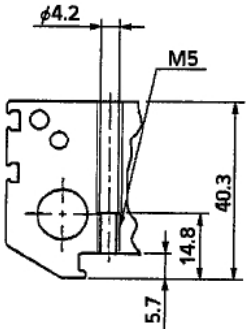
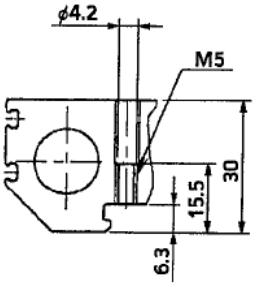
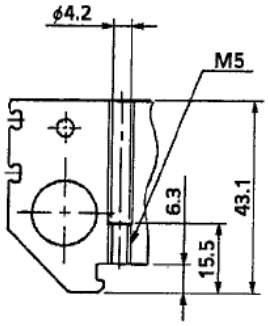
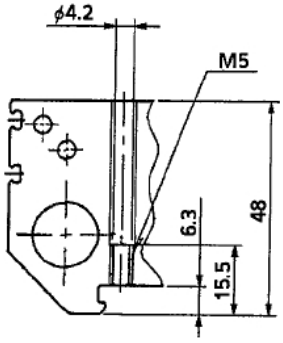
M4G2/M4G3 series, through hole or internal thread hole is available for installation.

When using the internal threads, select a mounting bolt that is screwed in by 10 threads or more, and note the tightening torque. Tightening torque 1.0 to 1.5 N･m (For M4G1 series, through holes only.) If not mounted correctly, this may cause the damage to the screws.

●M4G2 / M4G3 Series



Mounting hole shape(Secion)

	Internal pilot(Standard)		External pilot("K1")
	body porting [M4GD]	base piping [M4GE]	
M4G2			
M4G3			

4.3 Piping

⚠ CAUTION :

a) Observe the recommended tightening torque when connecting pipes.
- Observing the recommended tightening torque prevents air leakage and damage to the screw threads. To prevent damage to the screw threads, first use your hand to lightly tighten the screw and then use a tool to tighten the screw to the recommended torque.

b) Make sure that the pipes will not be disconnected at the joints by mechanical movements, vibrations or tension.
- If the exhaust piping of the pneumatic circuit is disconnected, the actuator speed control is disabled.
- If the above happens to a chuck holding mechanism, the chuck will open. The inadvertent opening of the chuck may cause a serious accident.

c) When supplying the compressed air for the first time after completing the piping, be sure to check every joint in the piping for air leakage.

d) When supplying the compressed air for the first time after completing the piping, increase the air pressure gradually but never introduce a highly-pressurized air suddenly.
- A sudden introduction of a highly-pressurized air may disconnect pipes at joints and/or cause the tubes to jump around, any of which may cause an injury.

e) Do not decrease the inside diameter of the piping from any of the solenoid valve exhaust ports to a diameter less than the exhaust pipe connecting port size.
- Normal operation of the actuator depends on the smoothness of the exhaust flow. With a manifold system, a restriction to the exhaust flow may prevent normal operation of other solenoid valves.

f) Removal of foreign matter
- Rust and other foreign matter in the pneumatic circuit may cause a malfunction or leakage from the valve seat. Insert a filter (maximum allowable particle size 5μm or less) immediately upstream of the solenoid valve.

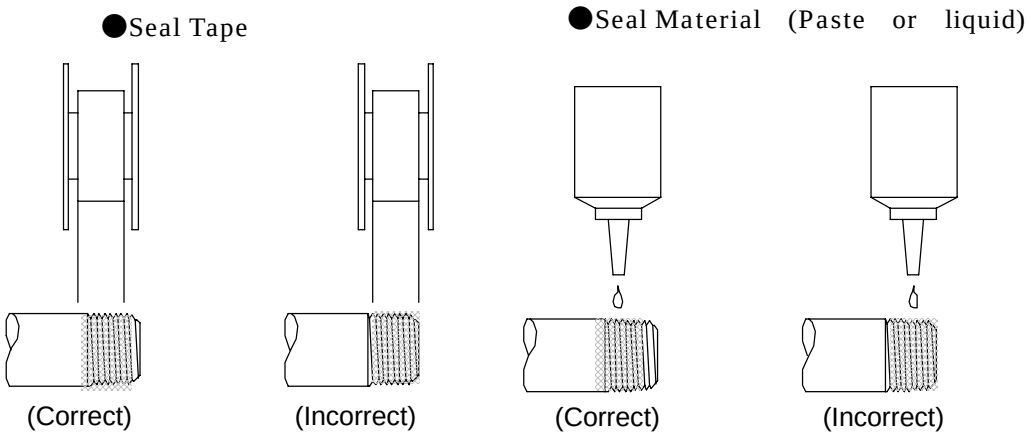
g) Air supply
- Do not restrict the flow of air through the air supply piping. With a manifold system with multiple stations, a drop in the air supply pressure may cause trouble through a delay in the operation timing.

Tightening torque

Joint screw	Tightening torque N·m
M5	0.5 to 1
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15

4.3.1 Seal material

When using seal material, take care to avoid getting it in the pipes or overflowing on the exterior surface of the pipes.



When applying fluororesin sealing tape to the screw threads, wind the tape two or three times around the threads but leave the one or two threads at the pipe end uncovered. Firmly press the tape against the threads using the tip of your fingernail. When applying liquid type seal material, apply the material to all the threads except one or two threads at the pipe end and take care not to apply too much of it.

Never apply the seal material to the female threads in the device side piping port.

4.3.2 Flushing

Before connecting pipes, flush the interiors of the tubes, solenoid valves, and connected devices to remove foreign matter.

4.3.3 M5 screw fitting

An M5 screw fitting is sealed using a gasket (Model No. for the gasket only: FGS).Do not retighten the fitting screw when pressure is generated in the pneumatic circuit. Design and construct the piping system in such a way that the valves may be removed and reinstalled if a trouble should happen.

4.3.4 Blow circuit

Do not open the cylinder port circuit to the atmosphere because a drop in the air supply pressure may cause malfunction. Select the external pilot type design instead of the internal pilot type design. The lowest allowable pressure with the internal pilot type design is 0.2 MPa.

4.3.5 Exhaust port

Minimize the restriction to the flow of the exhaust air because such restriction may cause a delay in the cylinder response. If such a delay happens, the speed needs to be adjusted between the cylinder and solenoid valve.

4.3.6 Pipe connections

(1) Tubes to be used

For use with solenoid valves with push-in joints, select tubes of the type specified by us:

Soft nylon tubes (F-1500 Series)
Urethane tubes (U-9500 Series)

(2) For installation at a site that has spatters in the air, select incombustible tubes or metal pipes.

(3) For a piping used for both hydraulic and pneumatic controls, select a hydraulic hose. When combining a spiral tube with a standard push-in joint, fix the tube origin using a hose band. Otherwise the rotation of the tube will decrease the efficiency of the clamping.
For use in a high-temperature atmosphere, select fastener joints instead of push-in joints.

(4) When selecting from tubes commercially available, carefully study the accuracy of the outside diameter as well as the wall thickness and the hardness. The hardness of a polyurethane tube should be 93° or more (as measured by a rubber hardness meter).
With a tube that does not have a sufficient accuracy of the outside diameter or the specified hardness, a decrease in the chucking force may cause disconnection or difficulty in inserting.

Tube dimensions

Outside diameter mm	Inside diameter mm	
	Nylon	Polyurethane
φ4	φ2.5	φ2
φ6	φ4	φ4
φ8	φ5.7	φ5
φ10	φ7.2	φ6.5

Outside diameter allowance

Soft or hard nylon	±0.1mm
Polyurethane φ4, φ6	+0.1mm -0.15mm
Polyurethane φ8, φ10	+0.1mm -0.2mm

(5) Minimum bending radius of tubes

Observe the minimum bending radius of tubes. Neglecting the minimum bending radius may cause disconnection or leaks.

Tube bore	Minimum bending radius mm	
	Nylon	Polyurethane
φ4	10	10
φ6	20	20
φ8	30	30
φ10	40	40

(6) Cutting a tube

To cut a tube, use a tube cutter to cut the tube perpendicularly to the length of the tube. Inserting an obliquely cut end of a tube may cause air leakage.

(7) Tube connections

Do not bend the tube immediately at the joint connection point. Lead it out straight from the end of the joint for a length equal to or greater than the outside diameter of the tube. The tension applied sideways through the tube should not exceed 40N.

(8) Blank plug to be used

For use with a solenoid valve with a push-in joint, select the blank plug specified by us:

Blank plug GWP□-B Series

4.4 Wiring

⚠ WARNING: When carrying out electrical connections, please perform disassembling and assembling work after reading the Instruction Manual carefully and with full understanding of its contents.

- Your understanding of the structure of solenoid valve and its operation principle is required in order to secure the safety.

⚠ CAUTION: Before supplying the power, check the power supply voltage and the current type (AC or DC).

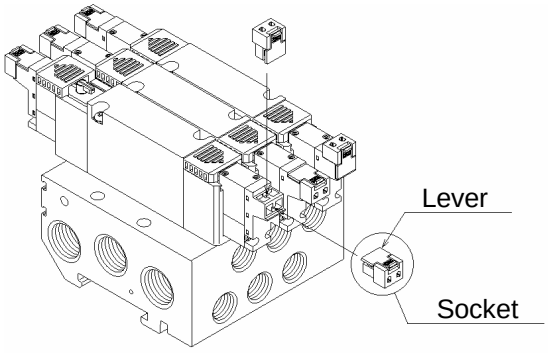
4.4.1 How to use E-connector

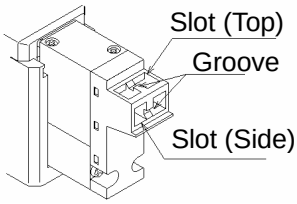
The E-connector is a top/side common connector to which the sockets can be connected to either the upward or lateral directions. The socket assembly is enclosed with the valve.
Select the connection direction based on installation.

1) How to mount/dismount socket

(1) When installing the socket, hold the lever and socket with your fingers and insert straight into the square window on the connector. Align the lever with the groove on the connector and lock. When installing from the top, face the socket so that the lever is in front. When installing from the side, face the socket so that the lever is on the top.

(2) When removing the socket, press down the lever to release jaws from the groove, then pull straight out.

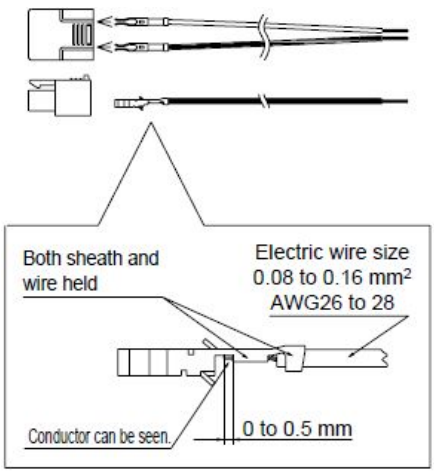




2) How to connect lead wire

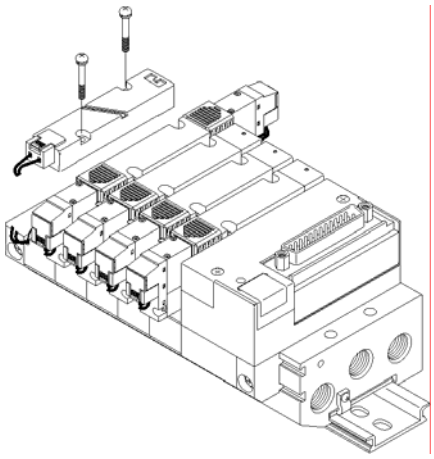
(1) Peal sheath of lead wire 3 mm from the top, arrange the top of conductor, and insert the conductor into the crimp terminal and crimp them with a crimping tool. Crimp both the sheath and wire, and check that 0 to 0.5 mm of the core wire end is visible.

(2) After crimping, face the contact terminal as shown below, and insert into the square window on the socket. The terminal locks when it is inserted into the back. After insertion, tug lightly on the terminal to check that it is locked.



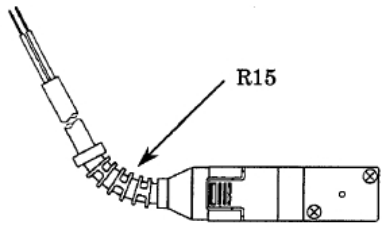
4.4.2 How to use A-connector

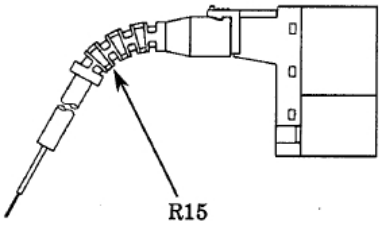
The A-connector is dedicated for the reduced wiring manifold, and is connected from the bottom.
The same precaution as when using the E-connector is required when installing and removing the socket.
When mounting and dismounting a socket, exercise the same caution as that when using E-type connectors.



4.4.3 How to use E*J type connector (Socket with cover type)

Dimensions below apply as the lead bending limit.





4.4.4 How to use DIN terminal box

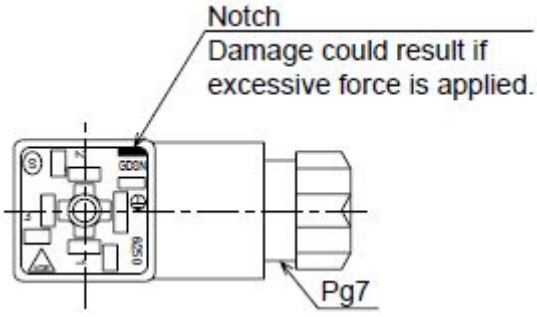
1) Disassembling

(1) Disassembling Loosen the screw (1), and pull the cover (2) in the direction of screw (1). The connector will come off the coil assembly (12).

(2) Pull the screw (1) out of the cover (2).

(3) There is a notch (9) (next to GDSN mark) on the bottom of the terminal block (3). Insert a small flat-tip screwdriver between the housing (2) and terminal block (3), and twist it. The terminal block (3) will come off the cover (2). (Refer to Fig. 1.)
Take care not to apply excessive force as there is a risk of damage.

(4) Remove the cable gland (4), and remove the washer (5) and rubber packing (6).

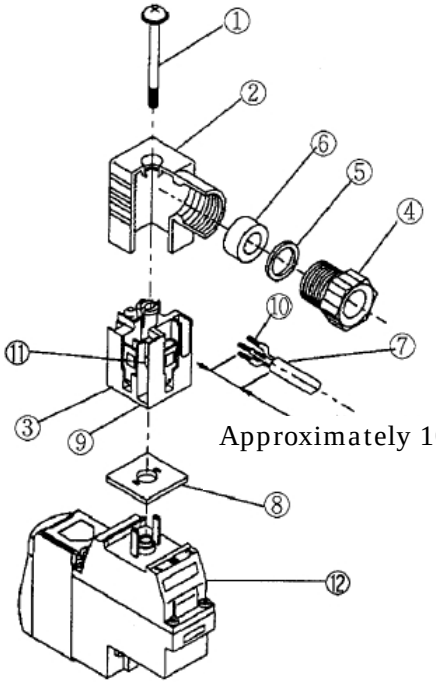


2) Wiring

(1) Press-fit a rod terminal [10] to the lead (stranded wire) of the cable [7]. Note that the solder less terminals must be prepared by the customer. For a single wire, the rod terminal is not necessary. A bare stranded wire can be used for wiring.
Note 1: Avoid wiring of a stranded wire with solder finish at the end.
Connect to terminals 1 and 2. There is no polarity.

(2) Pass the cable gland (4), washer (5) and rubber packing (6) in order through the cable (7), and insert into cover (2).

(3) Loosen the screw [11] in the terminal block [3], insert the terminal [10] and then re-tighten the screw [11].
・Recommended tightening torque is 0.2 to 0.25 N·m.
・The applicable outside diameter of the cable [7] is VCTF2 (3) conductor (φ3.5 to 7) specified in JISC3306.
・The lead wire sheath stripping length of the cable [7] is approximately 10 mm.
・When using the solder less terminals, select H0.5/6 (0.3 to 0.5mm2) or H0.75/6 (0.75mm2) manufactured by Wide Muller Japan Co. Ltd. or its equivalent.

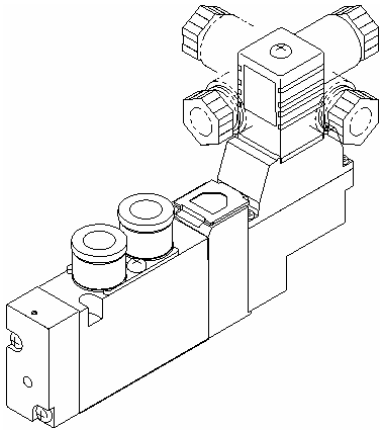


3) Assembly

(1) Set the connected terminal block (3) into the cover (2). (Press in until a click is heard.) * The terminal block can be set in four directions. (Refer to right sketch.)

(2) Set the rubber packaging (6) and washer (5) in order into the cover (2) cable lead-in port, and then securely tighten the cable gland (4).
Remarks: The reference tightening torque for the cable gland is 1.0 to 1.5 N·m.
Check that the cable cannot be pulled off.

(3) Set the gasket (8) between the bottom of the terminal block and the coil assembly (12) plug, and insert the connector.
Insert the screw 1 from the top of the cover (2) and tighten.
Remarks: Recommended tightening torque of a screw is 0.2 to 0.25 N·m.



4.4.5 Common terminal stand type: Wiring style T10/T11

1) Points requiring your attention with common terminal stand type (T10/T11):

(1) The internal common wiring for common terminal stand type has already been made. So, please unify the power source of manifold.
In case of a PC output unit of independent contact point type, apply a common wiring at the contact point.

(2) In order to avoid any improper wiring, please make sure again that the number of the station is corresponding to the solenoid. Follow the wiring style 3).

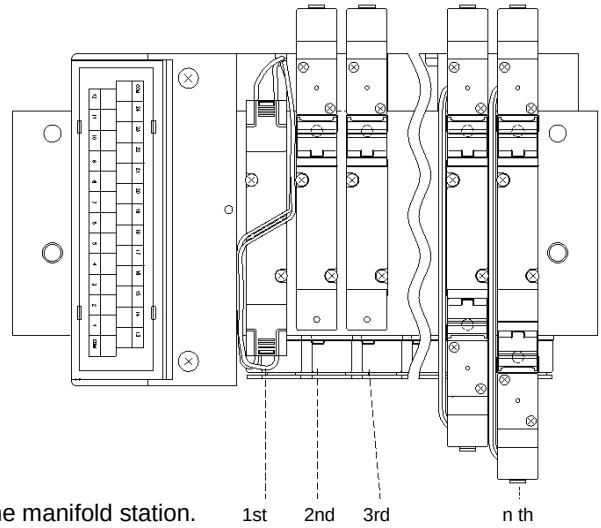
(3) If the number of solenoid exceeds 18, this cannot be supported, which please bear in your mind in advance.

(4) The number of the manifold station has been set in the order starting from left with the piping port facing front. (See figure.)

(5) Voltage drop may be caused when energized simultaneously or depending on the cable length. Please make sure that the voltage drop against solenoid valve is kept within 10% of rated voltage.

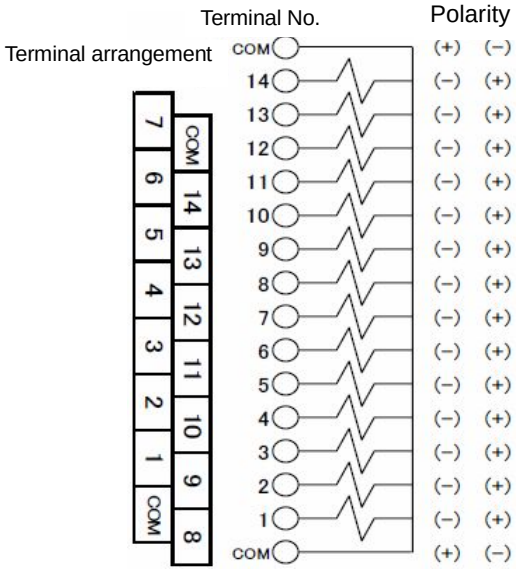
(6) For connection, use Y-terminal or ring terminal. For crimp terminal, please use the terminal for M3 with width 6.2mm or less. If you connect the lead wire directly, improper operation of the solenoid valve may be caused due to disconnection, contact failure, etc.

(7) Proper tightening torque of wiring screw: 0.5 to 0.7N･m

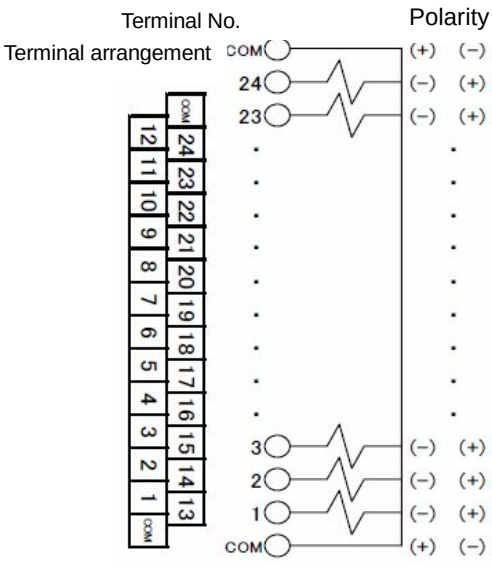


2) Interr

T10((Up to 14 solenoids))



T11((Up to 24 solenoids))



3) Wiring style T10

Maximum number of manifold station varies depending on the model. Please check the specifications for each model.

Note) Valve No. 1a, 2a, 2b , etc. the numbers indicate the 1st station and 2nd station respectively, and alphabet (a) means the solenoid on a-side and (b) means the solenoid on b-side respectively.

Terminal strip No.

	COM	14	13	12	11	10	9	8
7	6	5	4	3	2	1	COM	

<Standard wiring>

- In case of a single solenoid valve
  (Max. number of MF station: 14)

Terminal strip No.	14	13	12	11	10	9	8
Valve No.	14a	13a	12a	11a	10a	9a	8a
Terminal strip No.	7	6	5	4	3	2	1
Valve No.	7a	6a	5a	4a	3a	2a	1a

- In case of a double solenoid valve
  (Max. number of MF station: 7)

Terminal strip No.	14	13	12	11	10	9	8
Valve No.	7b	7a	6b	6a	5b	5a	4b
Terminal strip No.	7	6	5	4	3	2	1
Valve No.	4a	3b	3a	2b	2a	1b	1a

- In case of a mixture (Mixed installation of single and double)
  (Max. number of solenoid: 14)

Terminal strip No.	14	13	12	11	10	9	8
Valve No.	11a	10a	9a	8a	7b	7a	6a
Terminal strip No.	7	6	5	4	3	2	1
Valve No.	5a	4b	4a	3b	3a	2a	1a

<Double wiring>

- In case of a single solenoid valve
  (Max. number of MF station: 7)

Terminal strip No.	14	13	12	11	10	9	8
Valve No.	(Empty)	7a	(Empty)	6a	(Empty)	5a	(Empty)
Terminal strip No.	7	6	5	4	3	2	1
Valve No.	4a	(Empty)	3a	(Empty)	2a	(Empty)	1a

- In case of a double solenoid valve
  (Max. number of MF station: 7)

Terminal strip No.	14	13	12	11	10	9	8
Valve No.	7b	7a	6b	6a	5b	5a	4b
Terminal strip No.	7	6	5	4	3	2	1
Valve No.	4a	3b	3a	2b	2a	1b	1a

- In case of a mixture (Mixed installation of single and double)
  (Max. number of solenoid: 14)

Terminal strip No.	14	13	12	11	10	9	8
Valve No.	7b	7a	(Empty)	6a	(Empty)	5a	4b
Terminal strip No.	7	6	5	4	3	2	1
Valve No.	4a	(Empty)	3a	2b	2a	1b	1a

4) Wiring style T11

Maximum number of manifold station varies depending on the model. Please check the specifications for each model.

Note) Valve No. 1a, 2a, 2b , etc. the numbers indicate the 1st station and 2nd station respectively, and alphabet (a) means the solenoid on a-side and (b) means the solenoid on b-side respectively.

Terminal strip No.

COM	24	23	22	21	20	19	18	17	16	15	14	13
12	11	10	9	8	7	6	5	4	3	2	1	COM

<Standard wiring>

- In case of a single solenoid valve

(Max. number of MF station: 24)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	24a	23a	22a	21a	20a	19a	18a	17a	16a	15a	14a	13a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	12a	11a	10a	9a	8a	7a	6a	5a	4a	3a	2a	1a

- In case of a double solenoid valve

(Max. number of MF station: 12)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	12b	12a	11b	11a	10b	10a	9b	9a	8b	8a	7b	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	6b	6a	5b	5a	4b	4a	3b	3a	2b	2a	1b	1a

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 24)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	18b	18a	17a	16a	15a	14a	13a	12b	12a	11b	11a	10a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	9a	8a	7b	7a	6a	5a	4b	4a	3b	3a	2a	1a

<Double wiring>

- In case of a single solenoid valve

(Max. number of MF station: 12)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	(Empty)	12a	(Empty)	11a	(Empty)	10a	(Empty)	9a	(Empty)	8a	(Empty)	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	(Empty)	6a	(Empty)	5a	(Empty)	4a	(Empty)	3a	(Empty)	2a	(Empty)	1a

- In case of a double solenoid valve

(Max. number of MF station: 12)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	12b	12a	11b	11a	10b	10a	9b	9a	8b	8a	7b	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	6b	6a	5b	5a	4b	4a	3b	3a	2b	2a	1b	1a

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 24)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	12b	12a	11b	11a	(Empty)	10a	(Empty)	9a	(Empty)	8a	7b	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	(Empty)	6a	(Empty)	5a	4b	4a	3b	3a	(Empty)	2a	(Empty)	1a

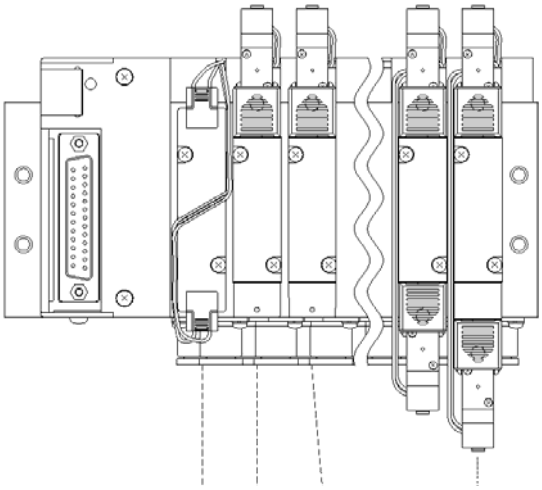
4.4.6 D sub-connector type : The connector for the T30

1) T30 connector

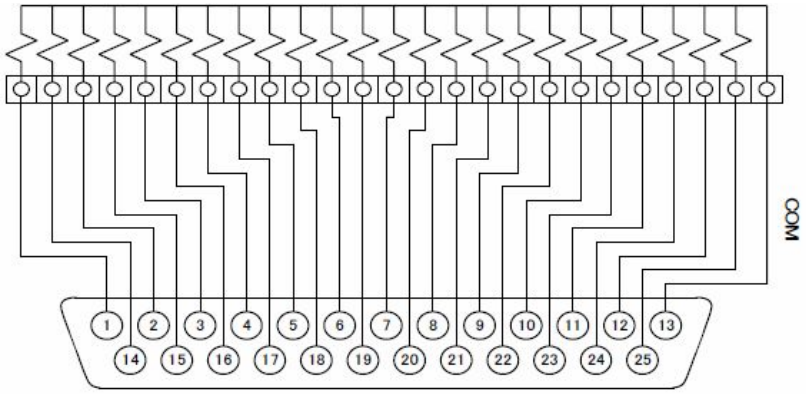
The connector for the T30, which is usually called the D sub-connector, is widely used in FA and OA equipment. The 25P type, in particular, is the connector specified in the RS232C standard for use in personal computer communication.

2) Points requiring your attention with the connector type (T30).

(1) It is necessary to match the signal arrangement of the PLC output unit and that on the valve side.
(2) The operation power is DC24V or DC12V.
(3) If the number of solenoid exceeds 24this cannot be supported, which please bear in your mind in advance.
(4) The number of the manifold station has been set in the order starting from left with the piping port facing front. (See figure.)
(5) Voltage drops will occur depending on cable lengths or at the time of simultaneous power supply. Make sure that a voltage drop for the solenoid is within 10% of the rated voltage.



3) Internal circuit



4) Wiring style T30

Maximum number of manifold station varies depending on the model. Please check the specifications for each model.

Note) Valve No. 1a, 2a, 2b , etc. the numbers indicate the 1st station and 2nd station respectively, and alphabet (a) means the solenoid on a-side and (b) means the solenoid on b-side respectively.

Terminal strip No.

COM	24	23	22	21	20	19	18	17	16	15	14	13
12	11	10	9	8	7	6	5	4	3	2	1	COM

<Standard wiring>

- In case of a single solenoid valve

(Max. number of MF station: 24)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	24a	23a	22a	21a	20a	19a	18a	17a	16a	15a	14a	13a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	12a	11a	10a	9a	8a	7a	6a	5a	4a	3a	2a	1a

- In case of a double solenoid valve

(Max. number of MF station: 12)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	12b	12a	11b	11a	10b	10a	9b	9a	8b	8a	7b	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	6b	6a	5b	5a	4b	4a	3b	3a	2b	2a	1b	1a

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 24)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	18b	18a	17a	16a	15a	14a	13a	12b	12a	11b	11a	10a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	9a	8a	7b	7a	6a	5a	4b	4a	3b	3a	2a	1a

<Double wiring>

- In case of a single solenoid valve

(Max. number of MF station: 12)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	(Empty)	12a	(Empty)	11a	(Empty)	10a	(Empty)	9a	(Empty)	8a	(Empty)	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	(Empty)	6a	(Empty)	5a	(Empty)	4a	(Empty)	3a	(Empty)	2a	(Empty)	1a

- In case of a double solenoid valve

(Max. number of MF station: 12)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	12b	12a	11b	11a	10b	10a	9b	9a	8b	8a	7b	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	6b	6a	5b	5a	4b	4a	3b	3a	2b	2a	1b	1a

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 24)

Terminal strip No..	24	23	22	21	20	19	18	17	16	15	14	13
Valve No..	12b	12a	11b	11a	(Empty)	10a	(Empty)	9a	(Empty)	8a	7b	7a
Terminal strip No..	12	11	10	9	8	7	6	5	4	3	2	1
Valve No..	(Empty)	6a	(Empty)	5a	4b	4a	3b	3a	(Empty)	2a	(Empty)	1a

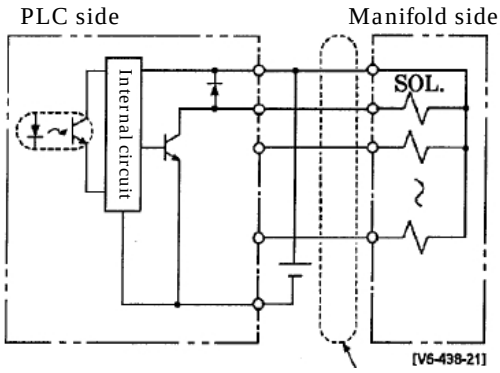
5) Connection to PLC

The common wiring has been internally done on the manifold side.

Since the electromagnetic valve has no polarity, it can be connected to either the NPN output or PNP output of the DC output unit of the PLC.

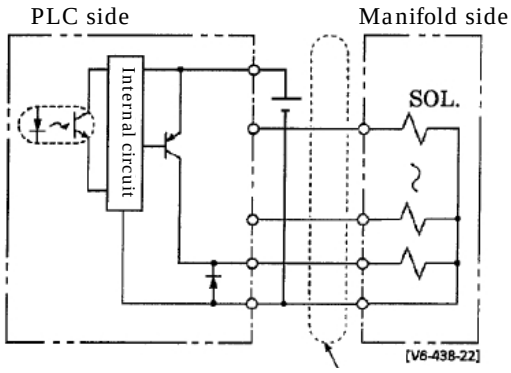
Wire each unit in the following manner.

●DC output unit (NPN output)

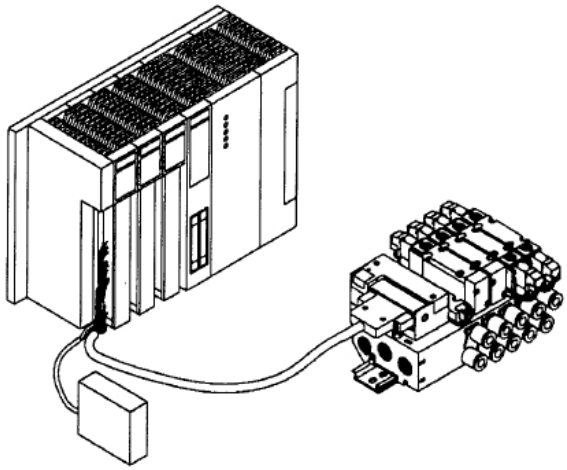


Multi core cable, etc

●DC output unit (PNP output)



Multi core cable, etc



6) Cable production

We recommend the following for the valve side in the production of the connection cable.

Name	Model	Manufacturer
D sub-connector socket solder type	HDBB-25S	Hirose Electric Co., Ltd.
D sub-connector socket solder type	JAZ-25S	Nippon Atchaku Tanshi
D sub-connector socket crimp type	CDB-25S	Hirose Electric Co., Ltd.
D sub-connector socket crimp type	JAC-25S	Nippon Atchaku Tanshi
Plug case (for the solder type) (with M2.6 screw)	HDB-CTF	Hirose Electric Co., Ltd.
Plastic cover with M2.6 screw	JCB-25M	Nippon Atchaku Tanshi

Avoid the use of the press-connect type as much as possible as it has small electric capacity and the fine core wire of the able causes large voltage drop.

7) CKD cable specifications

(CKD cables of the following models can be used)

Model **N4T** — **CABLE** — **D** **0** **0** — **1**

(Note 1) (Note 2)

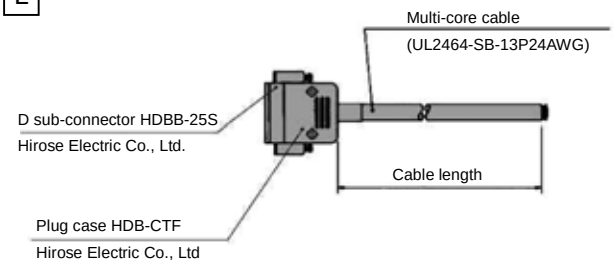
Note 1: Connecting method on the user side

0	Cutting only
1	With round crimp terminal for M3.5 screws

Note 2: Cable length L

1	1m
3	3m
5	5m

● N4T- CABLE- D00- L

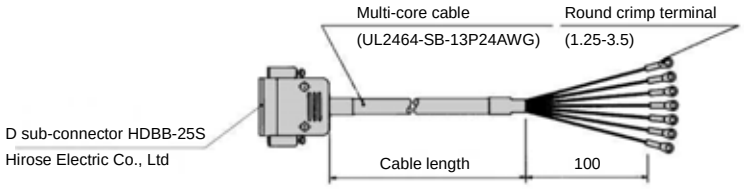


D sub-connector terminal numbers and core wires

D sub-connector terminal No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Wire end identify-cation	Color of insulator	Orange	Orange	Yellow	Yellow	Green	Green	Gray	Gray	White	White	Orange	Orange	Yellow	Yellow	Green
	Kind of markings	1-dot										2-dots				
	Color of marking	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black

D sub-connector terminal No.		16	17	18	19	20	21	22	23	24	25
Wire end identify-cation	Color of insulator	Green	Gray	Gray	White	White	Orange	Orange	Yellow	Yellow	Green
	Kind of markings	2-dots					3-dots				
	Color of marking	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black

● N4T- CABLE- D01- L



D sub-connector terminal numbers and core wires

D sub-connector terminal No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Wire end identify-cation	Color of insulator	Orange	Orange	Yellow	Yellow	Green	Green	Gray	Gray	White	White	Orange	Orange	Yellow	Yellow	Green
	Kind of markings	1-dot										2-dots				
	Color of marking	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black
Marked tube No.		1	2	3	4	5	6	7	8	9	10	Cut off	Cut off	13	14	15

D sub-connector terminal No.		16	17	18	19	20	21	22	23	24	25
Wire end identify-cation	Color of insulator	Green	Gray	Gray	White	White	Orange	Orange	Yellow	Yellow	Green
	Kind of markings	2-dots					3-dots				
	Color of marking	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black
Marked tube No.		16	17	18	19	20	21	22	23	24	25

* If more than 20 D-sub connector terminals are used, use the D00 type.

4.4.7 Flat cable type : The connector for the T50

1) Flat cable connector

The connector used in the T50 complies with the MIL standard (MIL-C-83503). Its flat-cable press-connection design makes wiring work easy. Pin numbers may differ from one PC manufacturer to another, but their functions are the same. Use the connector and the reversed triangle mark in the drawing below as a reference point for arrangement. The triangle mark serves as a reference point for both the plug and the socket.

2) Cautions regarding the connector type (T50)

(1) It is necessary to match the signal arrangement of the PC output unit and that of the valve side. Since direct connection with the PC is limited, use cables specified by the PC manufacturer. Refer to 5)。

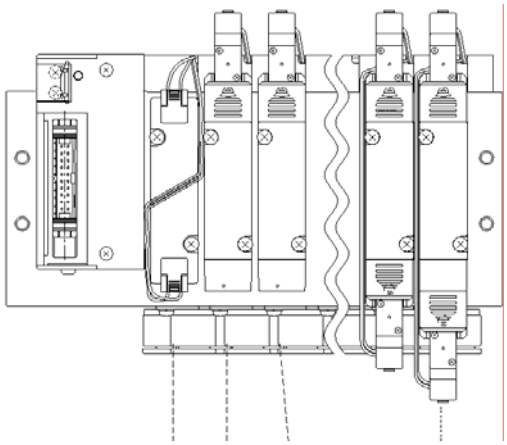
(2) The operation power is DC24V or DC12V.

(3) When driving the T50 by an ordinary output unit, use the + terminals (20, 10) of the 20-P connector as the + side common and use an NPN transistor output open collector type as the drive circuit.

(4) Make sure to connect the manifold to the output unit. Never connect it to the input unit as a problem will involve not only this unit, but also other related equipment as well, seriously aggravating the situation.

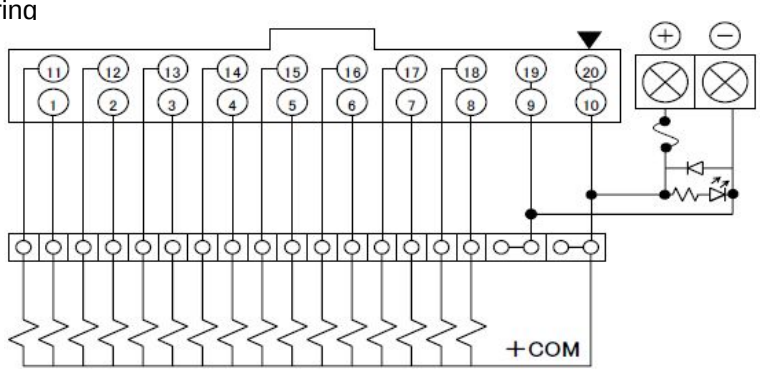
(5) The number of the manifold station has been set in the order starting from left with the piping port facing front. (Refer to the sketch below.)。

(6) Voltage drops will occur depending on cable lengths or at the time of simultaneous power supply. Make sure that a voltage drop for the solenoid is within 10% of the rated voltage.



The number of the manifold station.

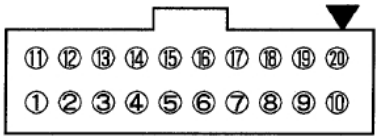
Internal wiring



4) Wiring style T50

Maximum number of manifold station varies depending on the model. Please check the specifications for each model.

Note) Valve No. 1a, 2a, 2b , etc. the numbers indicate the 1st station and 2nd station respectively, and alphabet (a) means the solenoid on a-side and (b) means the solenoid on b-side respectively.



<Standard wiring>

- In case of a single solenoid valve

(Max. number of MF station: 16) *1 : — electric power supply *2 : + electric power supply

Terminal strip No.	11	12	13	14	15	16	17	18	19	20
Valve No.	9a	10a	11a	12a	13a	14a	15a	16a	*1	*2
Terminal strip No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	*1	*2

- In case of a double solenoid valve

(Max. number of MF station: 8) *1 : — electric power supply *2 : + electric power supply

Terminal strip No.	11	12	13	14	15	16	17	18	19	20
Valve No.	5a	5b	6a	6b	7a	7b	8a	8b	*1	*2
Terminal strip No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	1b	2a	2b	3a	3b	4a	4b	*1	*2

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 16) *1 : — electric power supply *2 : + electric power supply

Terminal strip No.	11	12	13	14	15	16	17	18	19	20
Valve No.	7a	7b	8a	9a	10a	10b	11a	11b	*1	*2
Terminal strip No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	2a	3a	3b	4a	4b	5a	6a	*1	*2

<Double wiring>

- In case of a single solenoid valve

(Max. number of MF station: 8) *1 :: — electric power supply *2 : + electric power supply

Terminal strip No.	11	12	13	14	15	16	17	18	19	20
Valve No.	5a	(Empty)	6a	(Empty)	7a	(Empty)	8a	(Empty)	*1	*2
Terminal strip No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	(Empty)	2a	(Empty)	3a	(Empty)	4a	(Empty)	*1	*2

- In case of a double solenoid valve

(Max. number of MF station: 8) *1 : — electric power supply *2 : + electric power supply

Terminal strip No.	11	12	13	14	15	16	17	18	19	20
Valve No.	5a	5b	6a	6b	7a	7b	8a	8b	*1	*2
Terminal strip No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	1b	2a	2b	3a	3b	4a	4b	*1	*2

- In case of a mixture (Mixed installation of single and double)

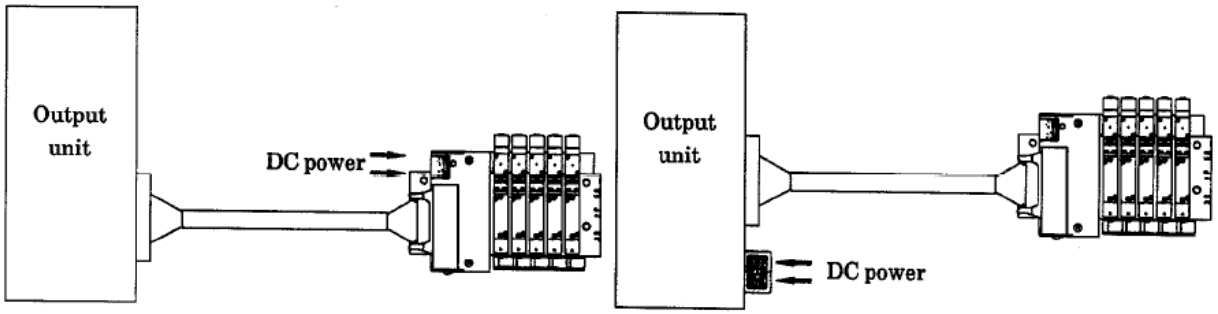
(Max. number of solenoid: 8) *1 : — electric power supply *2 : + electric power supply

Terminal strip No.	11	12	13	14	15	16	17	18	19	20
Valve No.	5a	(Empty)	6a	(Empty)	7a	7b	8a	(Empty)	*1	*2
Terminal strip No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	(Empty)	2a	(Empty)	3a	3b	4a	4b	*1	*2

5) Power supply

The terminal stand is designed to accept power supplied from an external source when such outside power supply is needed. Supply the power to the wiring block or the input/output unit in the manner as shown in the following drawings. The power indicator lamp comes on after the connection has been made correctly. For wiring, check the polarity marks on the cover. Wiring errors cause malfunctions.

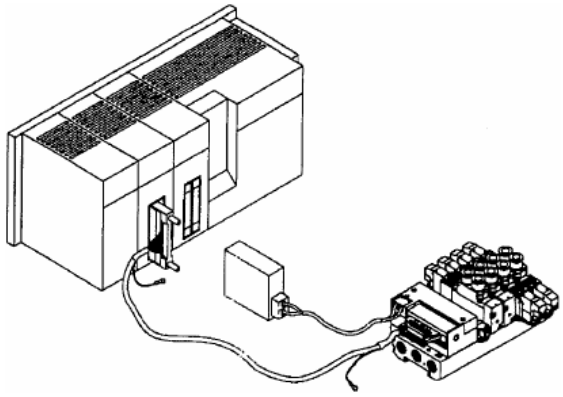
M3x6 screws are used for the terminal stand. Use M3 screws 6.4 or less in width to fasten the crimp terminals at the tightening torque of 0.3 to 0.5 N·m.



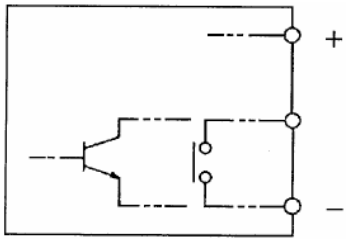
6) Connection to PLC

(1) The units described below can be directly connected to the output unit by the designated cable. Make sure to have the combinations right, as combination errors may cause serious problems. Use cables designated by the manufacturer.

Manufacturer	PLC model	Connecting cable model
OMRON Corporation	Model C200H-0D215 Mode C5000D415CN	Model G79-*C
	Model C500-0D213	Model G79−0*DC-*
Matsushita Electric Works, Ltd.	AFP33484	AY15133〜7
	AFP53487	AY15223〜7
Idec Izumi Corporation	PF3S-T532K	The same specifications as OMRON's



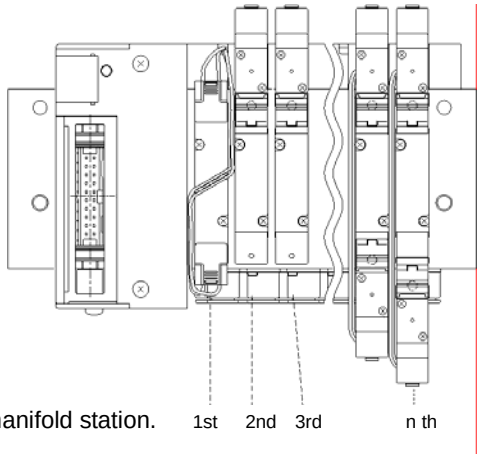
(2) When making a connection to units other than the PLC mentioned above, make sure that the signal line and power line are wired correctly. Even if the connectors have the same shape, their pin arrangements may not be the same with different manufacturers or unit types. Check the pint arrangement before the wiring. For the output unit, use one with a contact between the minus side of the power source and the output point, or one with an NPN transistor open collector output.



4.4.8 Flat cable connector type : The connector for the T51/T52/T53

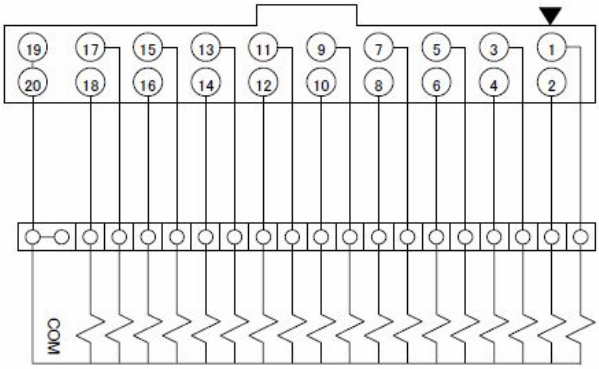
1) Cautions regarding the connector type (T51/T52/T53)

(1) The order of signals in the PLC output unit should match the order of signals in the solenoid valve system.
(2) The operation power is DC24V or DC12V.
(3) With the T51/T52/T53 type wiring, a general output unit should be used to drive the manifold.
(4) Make sure to connect the manifold to the output unit. Never connect it to the input unit as a problem will involve not only this unit, but also other related equipment as well, seriously aggravating the situation.
(5) The number of the manifold station has been set in the order starting from left with the piping port facing front. (Refer to the sketch below.)。
(6) Voltage drops will occur depending on cable lengths or at the time of simultaneous power supply. Make sure that a voltage drop for the solenoid is within 10% of the rated voltage.

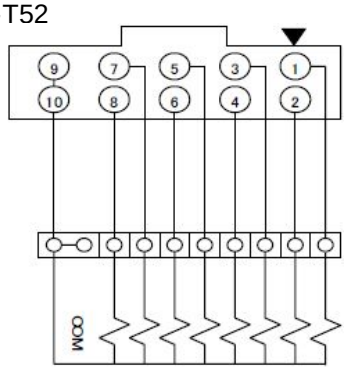


2) Internal wiring

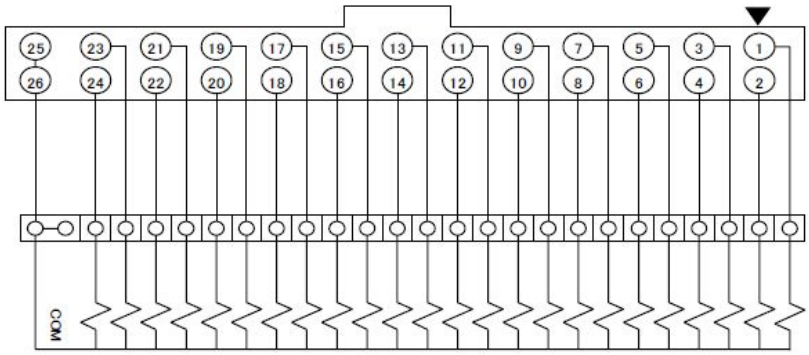
●T51



●T52



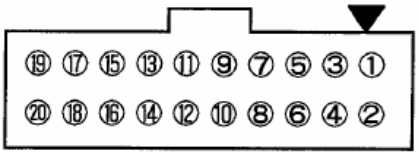
●T53



3) Wiring style T51

Maximum number of manifold station varies depending on the model. Please check the specifications for each model.

Note) Valve No. 1a, 2a, 2b , etc. the numbers indicate the 1st station and 2nd station respectively, and alphabet (a) means the solenoid on a-side and (b) means the solenoid on b-side respectively.



<Standard wiring>

- In case of a single solenoid valve

(Max. number of MF station: 18)

Terminal strip No.	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	17a	15a	13a	11a	9a	7a	5a	3a	1a
Terminal strip No.	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	18a	16a	14a	12a	10a	8a	6a	4a	2a

- In case of a double solenoid valve

(Max. number of MF station: 9)

Terminal strip No.	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	9b	8b	7b	6b	5b	4b	3b	2b	1b

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 18)

Terminal strip No.	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	12a	11a	10a	8a	7a	5a	4a	3a	1a
Terminal strip No.	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	13a	11b	10b	9a	7b	6a	4b	3b	2a

<Double wiring>

- In case of a single solenoid valve

(Max. number of MF station: 9)

Terminal strip No.	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)

- In case of a double solenoid valve

(Max. number of MF station: 9)

Terminal strip No.	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	9b	8b	7b	6b	5b	4b	3b	2b	1b

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 18)

Terminal strip No.	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	(Empty)	(Empty)	7b	(Empty)	(Empty)	4b	3b	(Empty)	(Empty)

4) Wiring style T52

Maximum number of manifold station varies depending on the model. Please check the specifications for each model.

Note) Valve No. 1a, 2a, 2b , etc. the numbers indicate the 1st station and 2nd station respectively, and alphabet (a) means the solenoid on a-side and (b) means the solenoid on b-side respectively.

<Standard wiring>

- In case of a single solenoid valve

(Max. number of MF station: 16)

Terminal strip No.	9	7	5	3	1
Valve No.	COM	7a	5a	3a	1a
Terminal strip No.	10	8	6	4	2
Valve No.	COM	8a	6a	4a	2a

- In case of a double solenoid valve

(Max. number of MF station: 8)

Terminal strip No.	9	7	5	3	1
Valve No.	COM	4a	3a	2a	1a
Terminal strip No.	10	8	6	4	2
Valve No.	COM	4b	3b	2b	1b

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 16)

Terminal strip No.	9	7	5	3	1
Valve No.	COM	5b	4b	3a	1a
Terminal strip No.	10	8	6	4	2
Valve No.	COM	6a	5a	4a	2a

<Double wiring>

- In case of a single solenoid valve

(Max. number of MF station: 8)

Terminal strip No.	9	7	5	3	1
Valve No.	COM	4a	3a	2a	1a
Terminal strip No.	10	8	6	4	2
Valve No.	COM	(Empty)	(Empty)	(Empty)	(Empty)

- In case of a double solenoid valve

(Max. number of MF station: 8)

Terminal strip No.	9	7	5	3	1
Valve No.	COM	4a	3a	2a	1a
Terminal strip No.	10	8	6	4	2
Valve No.	COM	4b	3b	2b	1b

- In case of a mixture (Mixed installation of single and double)

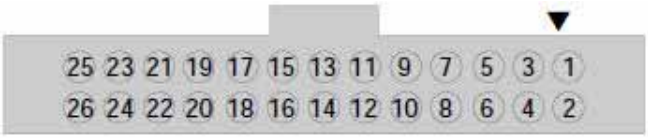
(Max. number of solenoid: 8)

Terminal strip No.	9	7	5	3	1
Valve No.	COM	4a	3a	2a	1a
Terminal strip No.	10	8	6	4	2
Valve No.	COM	4b	(Empty)	(Empty)	(Empty)

5) Wiring style T53

Maximum number of manifold station varies depending on the model. Please check the specifications for each model.

Note) Valve No. 1a, 2a, 2b , etc. the numbers indicate the 1st station and 2nd station respectively, and alphabet (a) means the solenoid on a-side and (b) means the solenoid on b-side respectively.



<Standard wiring>

- In case of a single solenoid valve

(Max. number of MF station: 18)

Terminal strip No.	25	23	21	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	23a	21a	19a	17a	15a	13a	11a	9a	7a	5a	3a	1a
Terminal strip No.	26	24	22	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	24a	22a	20a	18a	16a	14a	12a	10a	8a	6a	4a	2a

- In case of a double solenoid valve

(Max. number of MF station: 9)

Terminal strip No.	25	23	21	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	12a	11a	10a	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	26	24	22	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	12b	11b	10b	9b	8b	7b	6b	5b	4b	3b	2b	1b

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 18)

Terminal strip No.	25	23	21	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	16a	15a	14a	12a	10a	9a	8a	7a	5b	4b	3a	1a
Terminal strip No.	26	24	22	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	16b	1b	14b	13a	11a	9b	8b	7b	6a	5a	4a	2a

<Double wiring>

- In case of a single solenoid valve

(Max. number of MF station: 9)

Terminal strip No.	25	23	21	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	12a	11a	10a	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	26	24	22	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)	(Empty)

- In case of a double solenoid valve

(Max. number of MF station: 9)

Terminal strip No.	25	23	21	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	12a	11a	10a	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	26	24	22	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	12b	11b	10b	9b	8b	7b	6b	5b	4b	3b	2b	1b

- In case of a mixture (Mixed installation of single and double)

(Max. number of solenoid: 18)

Terminal strip No.	25	23	21	19	17	15	13	11	9	7	5	3	1
Valve No.	COM	12a	11a	10a	9a	8a	7a	6a	5a	4a	3a	2a	1a
Terminal strip No.	26	24	22	20	18	16	14	12	10	8	6	4	2
Valve No.	COM	(Empty)	(Empty)	(Empty)	9b	8b	7b	(Empty)	5b	4b	(Empty)	(Empty)	(Empty)

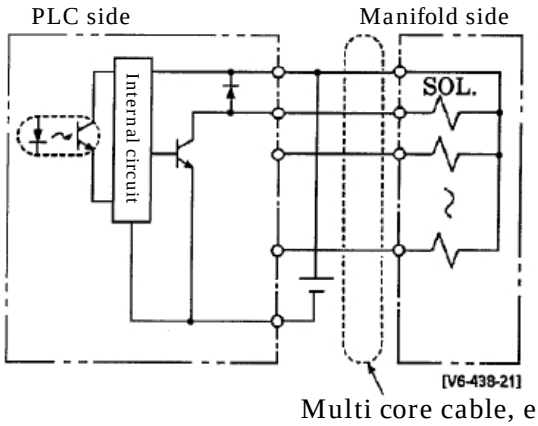
6) Connection to PLC

The common wiring has been internally done on the manifold side.

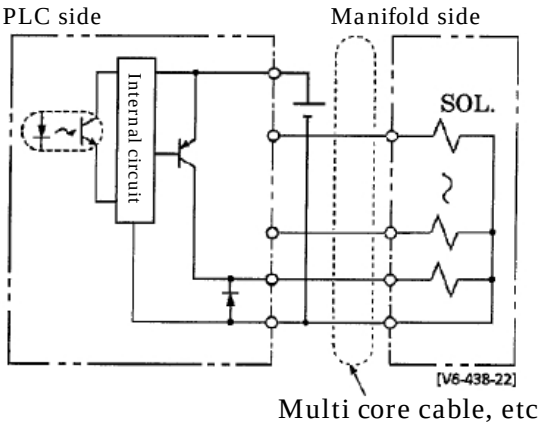
Since the electromagnetic valve has no polarity, it can be connected to either the NPN output or PNP output of the DC output unit of the PLC.

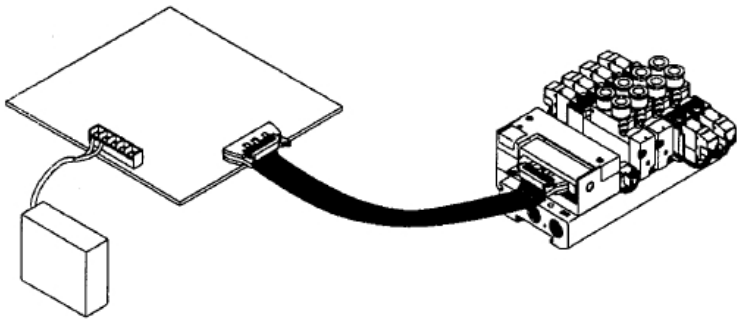
Wire each unit in the following manner.

● DC output unit (NPN output)



●DC output unit (PNP output)





7) Cable production

To produce a connecting cable, we recommend the following equipment for the valve side. Make a correct selection and connection of the cable according to the catalog data sheet. The equipment shown here all complies with the MIL standard (MIL-C-83503) ; thus, there are many others that can be also used for connection, but their locking mechanism may not be suitable.

If so, secure the lock lever with a hand.

- Socket XG4M-2030 (OMRON Corporation)
  Strain relief XG4T-2004
- Loose wire press-connector XGM5-2032 (OMRON Corporation)
- Loose wire press-connector XGM5-2035 (OMRON Corporation)
  (20-pin connector for T50/T51)

8) Cable

The system uses flat cables or slender multi-conductor cables.

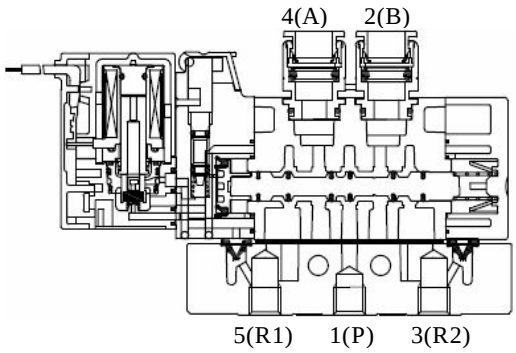
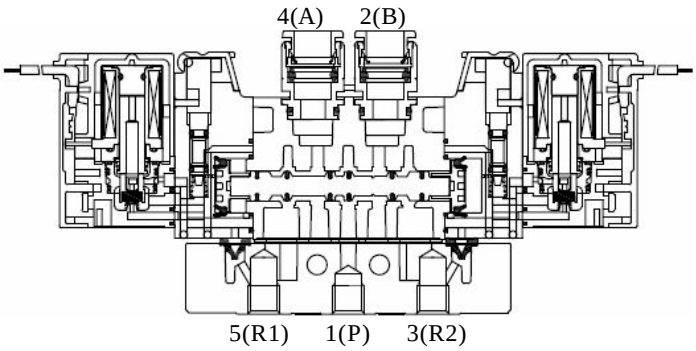
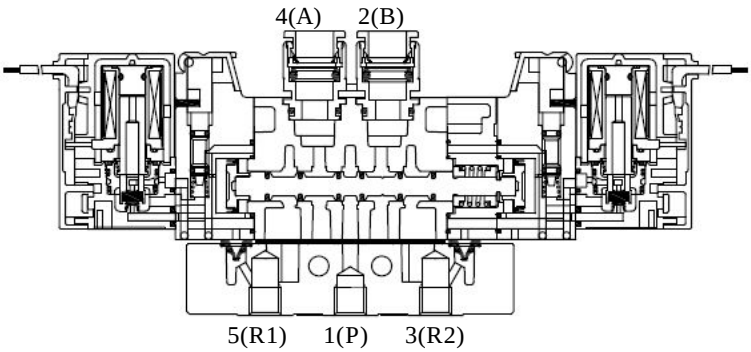
As these cables have fine core wires, it should be checked that they have enough mechanical strength and electric capacity.

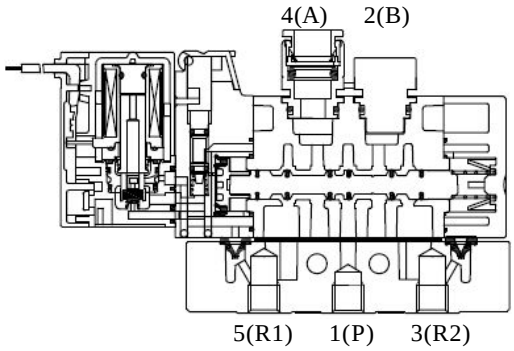
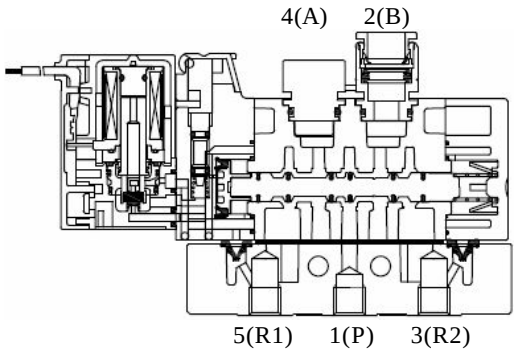
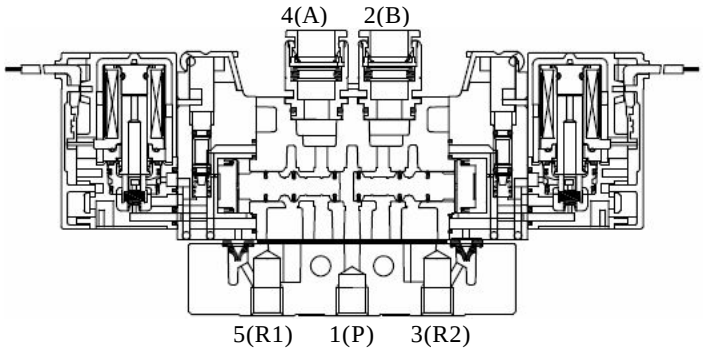
- Make sure to make a rounded corner (R) when bending the flat cable.
- The cable has large electric resistance (AWG28, approx. 0.22Ω/m).
  Pay special attention to voltage drop along the cable.
  If 16 solenoid valves are energized, voltage drop of approx. 0.1 V/m arises in the case of 24 V DC.

5. PROPER OPERATION

5.1 Description of operation

1) Valve operation

	Operation diagram (4GD1 series as an example)	Description of operation
4G**10 Single		De-energized. (As shown in the diagram) 1(P) → 2(B) 4(A) → 5(R1) Energized 1(P) → 4(A) 2(B) → 3(R2)
4G**20 Double		SOLa is energized 1(P)→4(A) 2(B)→3(R2) SOLb is energized. (As shown in the diagram) 1(P)→2(B) 4(A)→5(R1) The change-over position is retained even after the power is cut off.
4G**30 4G**40 4G**50 3-position		4G**30 De-energized 1(P), 4(A), 2(B), 5(R1), 3(R2) close 4G**40 De-energized 1(P) close 4(A), 2(B) → 5(R1), 3(R2) 4G**50 De-energized 1(P) → 4(A), 2(B) 5(R1), 3(R2) close

	Operation diagram (4GD1 series as an example)	Description of operation
3GD*10 Normally closed		De-energized. (As shown in the diagram) 4(A) → 5(R1) Energized 1(P) → 4(A)
3GD*110 Normally opened		De-energized. (As shown in the diagram) 1(P) → 2(B) Energized 2(B) → 3(R2)
3G**660 Two 3-port valve integrated type		De-energized. (As shown in the diagram) 4(A) → 5(R1) 2(B) → 3(R2) Energized 1(P) → 4(A) 2(B) → 3(R2)

2) Manifold operation

The main and pilot exhaust gases are collected in the manifold base and discharged from the exhaust port.

3) Prevention of malfunction

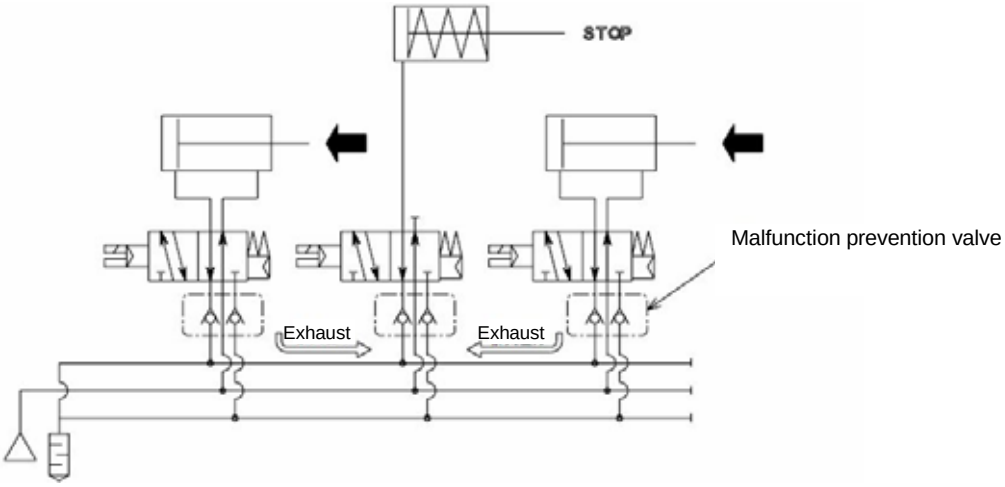
A PR check valve is provided as a standard option. An exhaust malfunction prevention valve is provided when optionally selecting the symbol H.

The PR check valve prevents malfunction of the solenoid valve due to pilot back pressure.

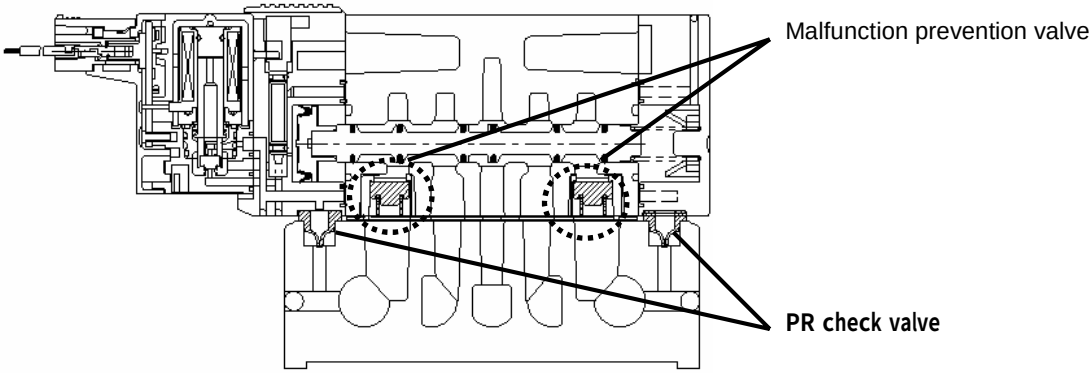
A single and/or a double cylinder connected to an ABR connection valve by the manifold may malfunction due to introduction of back pressure generated when other cylinders are driven. To prevent this malfunction, a gasket with a "malfunction prevention valve" can be selected. It cannot be selected for all-port block valves and PAB connection valves through which no back pressure is introduced.

Note: If a cylinder rod is directly operated with no pressure applied, note that the check valve can operate while the cylinder can not operate.

4G series as an example of air pressure system



Internal structure drawing



5.2 Manual operation

⚠ WARNING:

a) Once the manual operation device has been operated, always return it to its origin (initial position), and then start the operation of the device.

b) Before starting the manual operation, make sure that no one is around the cylinder to be operated.

c) After an operation, be sure to release the lock to turn the manual override OFF.

The lock is released (the manual override turned OFF) if the manual override protection cover is closed.

(1) 4G series is of a kind of pilot type solenoid valve. If you do not supply air to P-port, the main valve cannot be switched even if you operate the manual override.

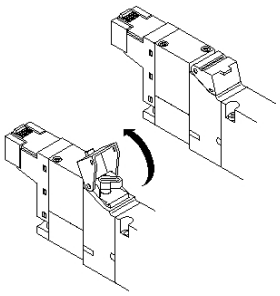
(2) The manual protection cover is provided as standard unit.
Since the product has been shipped with the manual protection cover closed, the manual device is protected and it cannot be seen when the product is delivered. After the product has been delivered, open the protection cover and manually operate the manual device.
Note that the product has a mechanism that the protection cover cannot be closed unless the lock type manual device is released.

(3) The manual override allows a non-lock type (push and release) operation as well as a lock type operation (push and lock). The push and lock operation consists of pressing and then turning the manual override knob. Be sure to press the knob before turning it. An attempt to turn the knob without pressing it may damage the manual override or cause air leakage.

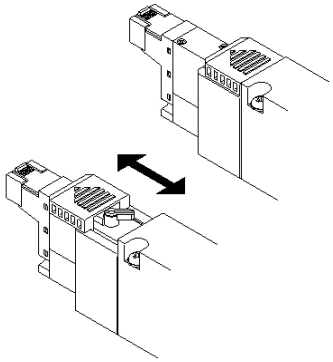
5.2.1 Opening and closing the manual override protection cover.

When opening or closing the manual protection cover, do not apply a force exceeding the specified level. If an excessive external force is applied, this may cause the protection cover to malfunction. (The force is less than 5N.)

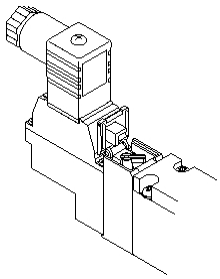
●4G1 Series



●4G2･3 Series



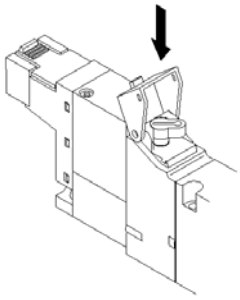
●4G2･3 Series DIN terminal box type



5.2.2 Operating the manual override

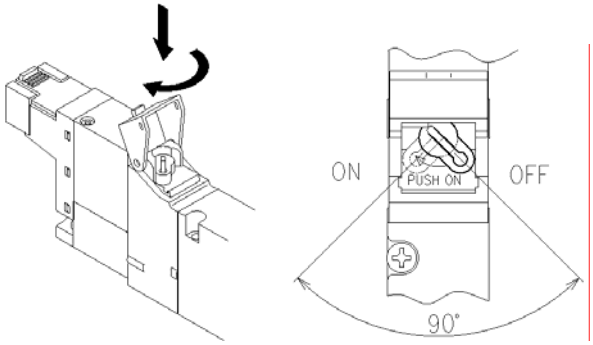
(1) Push and non-lock operation

Push the manual device in the direction indicated by an arrow until it is stopped.
When the manual device is released, the manual operation is then cancelled.



(2) Push and lock operation

Push the manual device and turn it 90° in the direction indicated by an arrow. Even though the manual device is released, the manual operation is not cancelled.



5.3 Air quality

WARNING:

a) Do not supply air other than the compressed air.

b) Always use clean compressed air not including corrosive gas.

CAUTION:

a) A large amount of drain, oxidized oil, tar, foreign matter, and piping rust are included in the compressed air and this may cause a trouble, such as malfunction or short service life.

Additionally, since the exhaust may cause an environment contamination, it is necessary to improve the air quality (air cleaning).

b) Once the oil less valve is lubricated, the oil less function cannot be maintained.
When lubricating the oil less valve, do not stop lubrication and continue the lubrication.

c) Do not use the spindle oil or machine oil since such oil may cause rubber parts to swell, causing a malfunction.

5.3.1 Lubrication

Generally, the 4GA/B4-series does not require any lubrication. If the lubrication is required, use additive-free turbine oil grade 1 (ISO-VG32).If the product is lubricated excessively or if the pressure is significantly low, the response time may be delayed. The response time indicated in the catalog shows the data obtained when the product is not lubricated and the pressure is 0.5 MPa.

5.3.2 Super-dry air

The super-dry air may cause the lubricant to scatter, resulting in short service life. The super-dry air means that the humidity class is 3 or less. (JIS B8392-1/ISO 8573-1)

5.3.3 Drain

(1) If the temperature inside the pneumatic piping or pneumatic device drops, the drain may occur.
(2) If the drain enters the air passage inside the pneumatic device, this may block the passage instantaneously, causing a malfunction.
(3) The drain may generate rust, causing the pneumatic device to malfunction.
(4) The drain may flush the lubricant, causing lubrication failure.

5.3.4 Contaminant

1) Always use compressed air without oxidized oil content, tar, and/or carbon of the air compressor.
(1) If oxidized oil content, tar, and/or carbon enter the inside of the pneumatic device and they are solidified, the resistance of the sliding part is increased, causing a malfunction.
(2) If oxidized oil content, tar, and/or carbon are mixed with the lubricant, the sliding part of the pneumatic device is worn out.

2) Always use compressed air without solid foreign matter.

(1) Solid foreign matter of the compressed air enters the inside of the pneumatic device, causing the sliding part to be worn out or leading to sticking symptom.

5.3.5 Improvement of air quality

The compressed air includes a large amount of drain (water, oxidized oil, tar, and/or foreign mater). This drain may cause the pneumatic device to malfunction. Therefore, the air must be dehumidified by the after cooler and dryer, foreign matter is removed through the air filter, and tar must also be removed through the air filter for the tar removal to improve the air quality (air cleaning).

5.4 Electric circuit

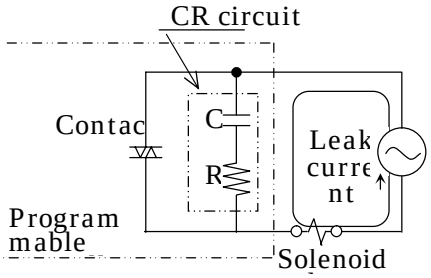
CAUTION:

a) To avoid malfunction caused by leak current from other control device, always check the leak current.

- When using the programmable controller, the leak current may affect the motion of the valve. Valve may not be switched even though the solenoid valve is not energized.

b) Control of leak current

- When the solenoid valve is operated by the programmable controller, make sure that the leak current from the output of the programmable controller is the level or less stated in the table below. If the leak current exceeds this level, this may cause a malfunction.



AC100V	2.0 mA or lower
AC12V	1.5 mA or lower
DC24V	1.8 mA or lower

(1) When energizing the double-solenoid type instantaneously, the energizing time must be 0.1 sec. or longer.
However, the cylinder may malfunction under load conditions on the secondary side. Therefore, it is recommended to perform the energizing or manual operation until the cylinder reaches the stroke end position.

(2) When energizing continuously, the temperature of the manifold surface increases.
This is not abnormal, but appropriate ventilation or heat radiation measures must be considered.

About AC100V specifications:

AC100V specifications have a built-in full wave rectified bridge.
In case of using SSR for ON/OFF of the solenoid valve, return failure of solenoid valve may occur depending on its type.
Please be careful when selecting SSR.

6. MAINTENANCE

6.1 Periodic inspection

⚠ WARNING:	Before providing a maintenance service, cut the power and the supply of compressed air and confirm the absence of residual pressure. ・The above is required to ensure safety.

⚠ CAUTION:	Regularly perform the daily and periodic inspections to correctly maintain product performance. ・If the product is not correctly maintained , product performance may deteriorate dramatically, resulting in a shorter service life, fractures of components, and malfunctions.

1) To use the solenoid valve system under optimum conditions, perform a periodic inspection once or twice a year.

2) Check the screws for loosening and the joints in the piping for integrity of the sealing. Regularly remove the drain from the air filters.

(1) Checking the compressed air supply pressure:
Is the supply pressure at the specified level?
Does the pressure gauge indicate the specified pressure when the system is operating?

(2) Checking the air filters:
Is the drain normally discharged?
Is the amount of dirt attached to the bowl and element at a normal level?

(3) Checking joints in the piping for the leakage of compressed air:
Are the pipes normally connected at joints, especially at the movable parts?

(4) Checking the operation of solenoid valves:
Is not there any delay in the operation? Is the exhaust flow normal?

(5) Checking the operation of pneumatic actuators:
Is the operation smooth?
Does the actuator stop normally at the end of the stroke?
Is the coupling with the load normal?

(6) Checking the lubricator:
Is the amount of oil adjusted properly?

(7) Checking the lubrication oil:
Is the supplied lubrication oil of the type specified by the manufacturer?

6.2 Disassembly and reassembly

WARNING: Before providing maintenance service, cut the power and the supply of compressed air and confirm residual pressure is released.

・The above is required to ensure safety.

WARNING: Regularly perform the daily and periodic inspections to correctly maintain product performance.

・If the product is not correctly maintained , product performance may deteriorate dramatically, resulting in a shorter service life, fractures of components, and malfunctions.

6.2.1 Replacement of solenoid valve

When replacing the solenoid valve, pay special attention so that the gasket ,O-ring, quick valve is not fallen down.

	Nominal designation of thread	Recommended tightening torque [N・m]
4G1	M1.7	0.18～0.22
4G2	M2.5	0.25～0.33
4G3	M3	0.6～0.7

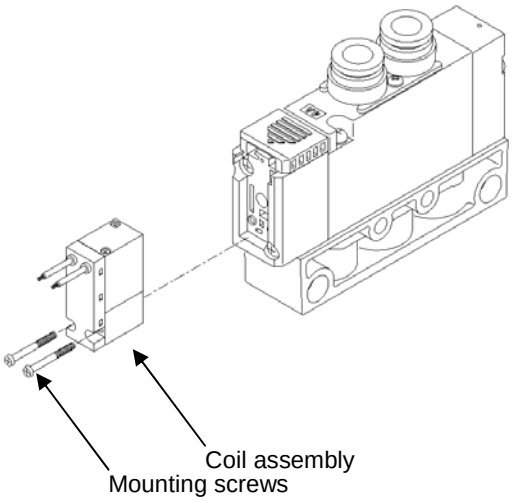
6.2.2 How to replace coil

Replace the coil by removing the set screw shown below. Loosening the other screws could cause operation faults. When installing, check that the gasket is installed on the coil side, and note tightening torque. Improper installation could result in air leaks or operation faults. If not mounted correctly, this may cause air leak or malfunction.

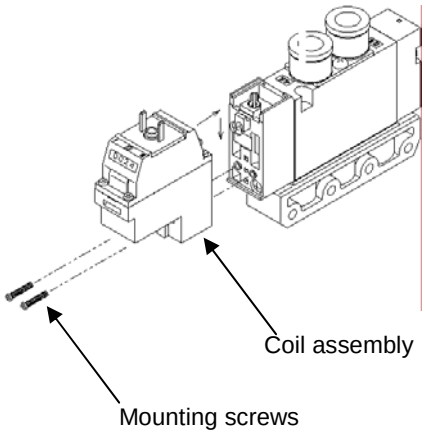
The coil assemblies can not be replaced as DIN terminal box types are not compatible with others.

Recommended tightening torque 0.14 to 0.18[N・m]

●Grommet lead wire, E/EJ-connector coil assembly



●DIN terminal box coil assembly



6.2.3 Replacement of cartridge joint

Before changing the push-in joint size, check the proper work steps.

If the cartridge joint is not mounted correctly or if the mounting screw is tightened insufficiently, this may cause air leak.

1) Direct piping (D) type

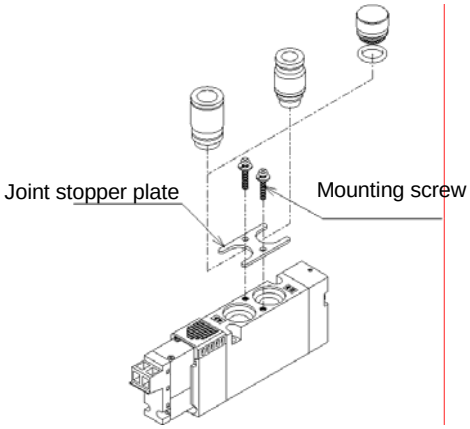
(1) Remove the mounting screws.

(2) Pull out the stopper plate and joint at the same time.

(3) Adjust the groove on the joint for replacement to the stopper plate, and assemble them temporarily.

(4) Mount the stopper plate and joint at the same time, and then tighten the mounting screws firmly.

Pull the joint to check the mounting status.



	Size	Tightening torque (N･m)
4G1	M1.7	0.18～0.22
4G2	M2.5	0.25～0.30
4G3	M3	0.6～0.7

2) Base piping (E) type

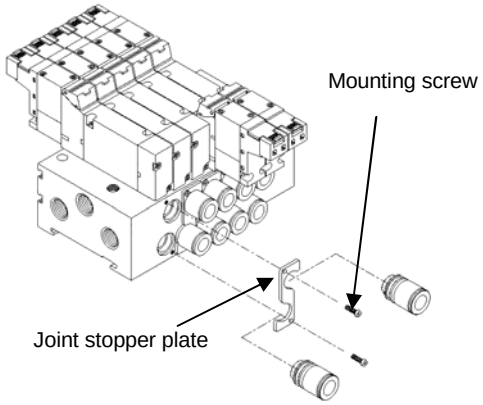
(1) Remove the mounting screws.

(2) Pull out the stopper plate and joint at the same time.

(3) Adjust the groove on the joint for replacement to the stopper plate, and assemble them temporarily.

(4) Mount the stopper plate and joint at the same time, and then tighten the mounting screws firmly.

Pull the joint to check the mounting status.



	Size	Tightening torque (N･m)
4G1	M1.7	0.18～0.22
4G2	M2.5	0.25～0.30
4G3	M3	0.6～0.7

6.3 Additional installation of a valve unit to a reduced wiring type manifold

⚠ WARNING:

When disassembling or assembling the manifold, perform it after reading the Instruction Manual carefully and with full understanding of its contents.

- You are required to understand the structure of solenoid valve and its operation principle to secure the safety.
- A level of 2nd Class or more of Pneumatics Technology Certification is required.

6.3.1 Expanding at reserved wiring position

The reserved wiring is provided beforehand on the masking plate at the expansion position.

When reserved wiring is provided, use the following procedures to expand the valves.

(1) Remove the reserved socket from the masking plate.

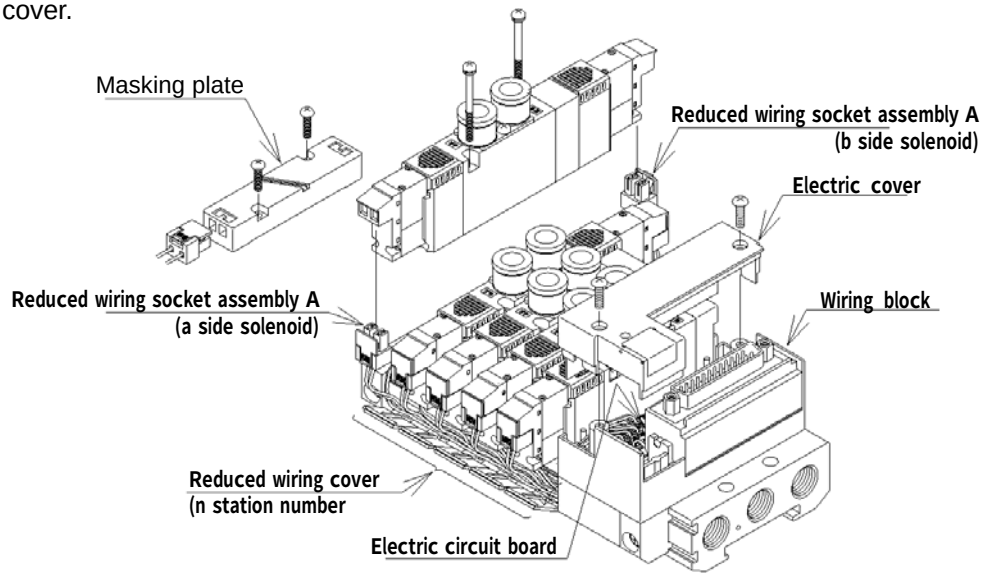
(2) Remove the masking plate from the base.

(3) Install valve for expansion on the base and assemble socket.

6.3.2 Expanding at position with no reserved wiring

When changing from the single to double type, internal wiring must be added to the b side solenoid to be expanded. Use the following procedures to expand the valves when reserved wiring is not provided.

(1) Remove the electric cover and open the reduced wiring cover.
(2) Replace the valve to be changed. Replace the socket for a side solenoid.
(3) Install socket (optional) for b side solenoid.
Pass the wiring between the valves, and pull out to the a side.
(4) Lead the wiring to the wiring block, and insert the connector into the wiring PCB.
(5) Store the wiring in the reduced wiring cover. Close the reduced wiring cover, and install the electric cover.



6.3.3 How to open/close reduced wiring cover

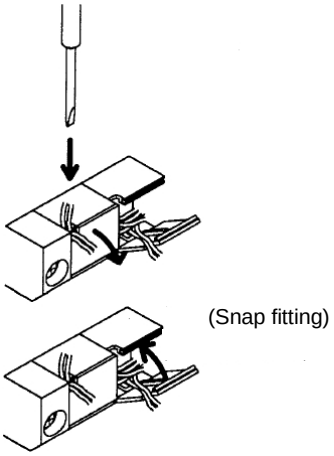
1) How to open reduced wiring cover

Catch a precision screwdriver in the cable hole on the reduced wiring cover, and open the cover. Use an object with a dull end so that cables are not damaged when catching the cover.

2) How to close reduced wiring cover

Pass cables through the cable hole in the reduced wiring cover, then close the cover.

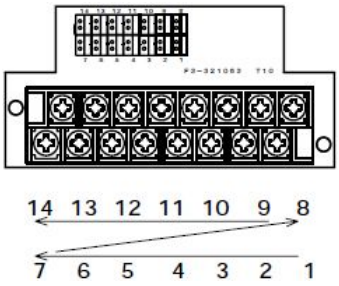
Confirm that the cable is not caught, and close the cover until a click is heard.



6.3.4 Connection procedure of electric circuit board

Connector and valve's compatibility on electric circuit board may differ depending on reduced wiring specifications (T10, T11, T30, T50, T51, T52, T53, T6*, T7*). When wiring the connector, always confirm the connector No. printed on the PCB.

The connector No. indicates a pin number of each connector.

<table>
<tr><th></th><th>Electric circuit board assembly
Wire to order of arrow</th><th>Compatibility with valves</th></tr>
<tr><td>T10</td><td> 
</td><td>1) When single SOL only (Max. MF station number: 14)
<table>
<tr><td>Connector</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td></tr>
<tr><td>Valve No.</td><td>14a</td><td>13a</td><td>12a</td><td>11a</td><td>10a</td><td>9a</td><td>8a</td></tr>
<tr><td>Connector</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Valve No.</td><td>7a</td><td>6a</td><td>5a</td><td>4a</td><td>3a</td><td>2a</td><td>1a</td></tr>
</table>
2) When double SOL only (Max. MF station number: 7)
<table>
<tr><td>Connector</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td></tr>
<tr><td>Valve No.</td><td>7b</td><td>7a</td><td>6b</td><td>6a</td><td>5b</td><td>5a</td><td>4b</td></tr>
<tr><td>Connector</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Valve No.</td><td>4a</td><td>3b</td><td>3a</td><td>2b</td><td>2a</td><td>1b</td><td>1a</td></tr>
</table>
3) When mix (Max. solenoid number: 14)
<table>
<tr><td>Connector</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td></tr>
<tr><td>Valve No.</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>7b</td><td>7a</td><td>6a</td></tr>
<tr><td>Connector</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
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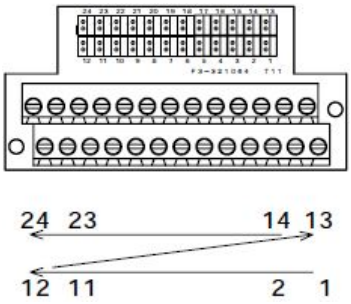
<tr><td>T11</td><td> 
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<tr><td>Connector</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td><td>16</td><td>15</td><td>14</td><td>13</td></tr>
<tr><td>Valve No.</td><td>24a</td><td>23a</td><td>22a</td><td>21a</td><td>20a</td><td>19a</td><td>18a</td><td>17a</td><td>16a</td><td>15a</td><td>14a</td><td>13a</td></tr>
<tr><td>Connector</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
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2) When double SOL only (Max. MF station number: 12)
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3) When mix (Max. solenoid number: 24)
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<tr><td>Valve No.</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td><td>(Void)</td></tr>
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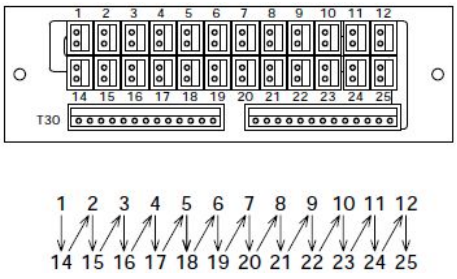
<tr><td>T30</td><td> 
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<tr><td>Connector</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr>
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3) For mix (Max. solenoid number: 24)
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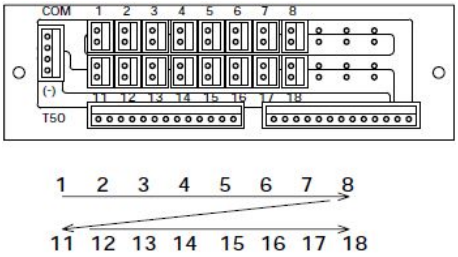
T6*</td><td> 
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</table>
2) For double SOL (Max. MF station number: 8)
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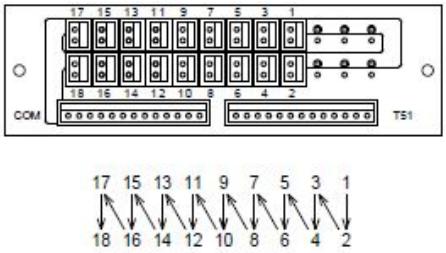
<tr><td>T51</td><td> 
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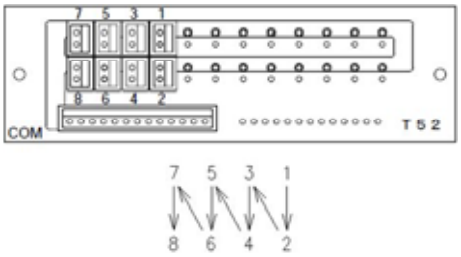
<tr><td>T52</td><td> 
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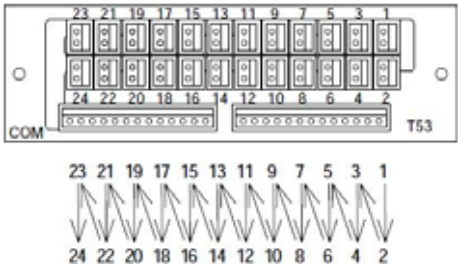
<tr><td>T53</td><td> 
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</table>

7. TROUBLE SHOOTING

TROUBLE SHOOTING

Motion troubles	Suspected cause	Remedies
Does not actuate	No electric signals	Turn on the power
	Damage to signal wiring system	Repair the control circuit
	Excessive fluctuating range of current or voltage	Reaffirm the power capacity. (within ±10% of voltage fluctuation)
	The circuit is not wired correctly	Wire the circuit correctly
	All pilot exhaust port is closed	Rectify the piping system
Malfunctions	Excessive leaking current	Correct control circuit and / or set a bleed circuit
	Chattering	Inspect switching system and / or tighten each loosen terminal screw
	Voltage deviates than specified on the name plate	Rectify the voltage to meet the specification
	Damaged or short circuited coil	Replace the coil
	Erroneous shut off pressure source	Turn on the power source
	Insufficient pressure	Reset the pressure reducer valve or install a pressure raising valve
	Insufficient flow of fluid	Rectify the size of pipe or install a surge tank
	Pressure supplied through exhaust port	Change the piping to an external pilot system
	Erroneous piping, erroneous omitting some piping	Rectify the piping system
	Speed control valve completely closed by error	Reset the needle valve
	A port B port is directly released to an open atmosphere.	Install pipe joints to A and B ports with diameter equal to or smaller than that of to P port joint
	Valve is frozen	Add remedies of avoiding freezing (Heating system or dehumidifying system etc.)
	Delayed return of a plunger (Excessive oil, existence of tar)	Check the quality of the lubricant (Turbine oil type1, ISO VG 32 or equivalent) Rectify the quantity of lubricant drip Install a tar removing filter
	Clogged-up exhausting port with dust	Install a cover or silencer and clean it regularly
High actuating pressure is required	Bulged or decomposed packings	Check the quality of the lubricant (Turbine oil type1, ISO VG 32 or equivalent) Relocate the valves away from splashing area of cutting coolant Keep organic chemicals away from valves.
	Release of A and / or B port to an open atmosphere directly	Check the piping. Apply more grease.
	Foreign particles cut into packing lips	Remove the foreign particle away from the packing.

8. PRODUCT SPECIFICATIONS AND HOW TO CODE MODEL NUMBERS

8.1 Product specifications

1) Common specifications

Model number / Item		4G1･4G2･4G3
Working fluid		Compressed air
Operation method		Pilot operated type
Valve structure		Soft spool valve
Min. working pressure MPa		0.2
Max. working pressure MPa		0.7
Proof pressure MPa		1.05
Ambient temperature ℃		-5～55 (No freezing)
Fluid temperature ℃		5～55
Manual override		Locked / Non-locked common type
Pilot exhaust method	Internal pilot	Main valve / pilot operated valve common exhaust
Lubrication [Note 1]		Not required
Protection structure [Note 2]		Dust-proof/Jet-proof (equivalent to IP65 enclosure)
Vibration/shock m/s^2		50 or less / 300 or less
Working atmosphere		Must not used in any corrosive gas environment

Note 1 : In case of lubrication, please use turbine oil 1st grade ISO VG32.
Excess lubrication or intermittent lubrication may cause unsteady operation.

Note 2 :The protective structure is dust-proof, but not drip-proof. Check that water drops or oil, etc., do not come into contact. IP65 (jet-proof type) is used for DIN terminal box specifications. It is precondition that the outer diameter of applicable specified cord and tightening torque shall be used to fix it in place. As the structure is not durable to continuous pouring of water, protect it with a cover box.

2) Electric specifications

Model No. / Item		4G1･4G2･4G3
Rated voltage V	DC	12、24
	AC	100 (50/60 Hz)
Variation range of rated voltage		±10%
Holding current A	DC12V	0.046 (0.025)
	DC24V	0.023 (0.025)
	AC100V	0.010 (0.012)
Power consumption W	DC12V	0.55 (0.6)
	DC24V	0.55 (0.6)
Apparent power VA	AC100V	1.0 (1.2)
Heat-resistance class		B
Temperature rise °C		50
Surge absorber Note 4		Option
Indicator		Standard

Note 3: The values in ( ) include the light.

Note 4: The DIN terminal box type has a built-in lamp surge killer as a standard option.
The values within the parentheses are applicable to such type.

3) Response time

Item			4G1		4G2		4G3	
			ON	OFF	ON	OFF	ON	OFF
Response time [ms]	Two 3 -port valves built-in		12	15	15	30	–	–
	2-position	Single	15	25	20	30	25	40
		Double	15	–	20	–	25	–
	3-position	ABR port connection	20	30	25	35	35	50

Values include the light surge suppressor. Response time is the value at an air supply of 0.5 MPa, 20℃, and oil-free.
Changes based on pressure and quality of oil.

4) Flow characteristics

Model no.	Position type		1(P)→4(A)/2(B)		4(A)/2(B)→5(R1)/3(R2)	
			C[dm^3/(s/bar)]	b	C[dm^3/(s/bar)]	b
3GD1	2-position		1.2	0.47	0.7	0.39
	Two 3 -port valves built-in		0.98	0.45	0.66	0.38
3GD2	2-position		2.4	0.33	2.7	0.28
	Two 3 -port valves built-in		1.8	0.29	2.2	0.34
3GD3	2-position		3.4	0.29	3.9	0.27
4GD1	2-position		1.2	0.47	0.70	0.39
	3-position	All ports blocked	1.1	0.39	0.66	0.29
		ABR port connection	1.1	0.33	0.68	0.31
		PAB port connection	1.3	0.61	0.67	0.43
4GD2	2-position		2.4	0.33	2.7	0.28
	3-position	All ports blocked	2.2	0.28	2.4	0.27
		ABR port connection	2.3	0.26	2.7	0.32
		PAB port connection	2.5	0.38	2.4	0.33
4GD3	2-position		3.4	0.29	3.9	0.27
	3-position	All ports blocked	3.1	0.27	3.2	0.32
		ABR port connection	3.1	0.33	4.0	0.25
		PAB port connection	3.5	0.43	3.3	0.39
3GE1	Two 3 -port valves built-in		0.92	0.08	1.0	0.11
3GE2	Two 3 -port valves built-in		1.7	0.42	2.1	0.32
4GE1	2-position		1.3	0.27	1.2	0.15
	3-position	All ports blocked	1.1	0.31	1.1	0.29
		ABR port connection	1.1	0.31	1.3	0.29
		PAB port connection	1.4	0.30	1.1	0.26
4GE2	2-position		2.6	0.20	2.5	0.15
	3-position	All ports blocked	2.3	0.32	2.2	0.19
		ABR port connection	2.2	0.23	2.4	0.14
		PAB port connection	2.4	0.10	2.3	0.24
4GE3	2-position		4.3	0.24	4.2	0.18
	3-position	All ports blocked	3.3	0.40	3.2	0.35
		ABR port connection	3.3	0.36	4.2	0.28
		PAB port connection	4.5	0.28	3.4	0.40

Model no.	Position type		1(P)→4(A)/2(B)		4(A)/2(B)→5(R1)/3(R2)	
			C[dm^3/(s/bar)]	b	C[dm^3/(s/bar)]	b
M3GD1 M4GD1	Two 3 -port valves built-in		0.86	0.31	0.66	0.22
	2-position		0.99	0.20	0.70	0.12
	3-position	All ports blocked	0.94	0.23	0.99	0.09
		ABR port connection	0.93	0.18	0.70	0.02
		PAB port connection	1.1	0.28	1.0	0.12
M3GD2 M4GD2	Two 3 -port valves built-in		1.7	0.40	1.7	0.32
	2-position		2.3	0.36	1.7	0.33
	3-position	All ports blocked	2.1	0.35	2.4	0.37
		ABR port connection	2.2	0.37	1.8	0.29
		PAB port connection	2.4	0.34	2.5	0.33
M3GD3 M4GD3	2-position		3.2	0.37	2.5	0.28
	3-position	All ports blocked	2.9	0.35	3.2	0.35
		ABR port connection	3.0	0.34	2.6	0.27
		PAB port connection	3.3	0.30	3.3	0.32
M3GE1 M4GE1	Two 3 -port valves built-in		0.86	0.35	0.67	0.23
	2-position		1.1	0.22	0.70	0.10
	3-position	All ports blocked	0.98	0.22	1.0	0.11
		ABR port connection	0.97	0.35	0.68	0.24
		PAB port connection	1.1	0.38	0.99	0.22
M3GE2 M4GE2	Two 3 -port valves built-in		1.7	0.44	1.6	0.3
	2-position		2.4	0.34	1.7	0.31
	3-position	All ports blocked	2.2	0.34	2.4	0.29
		ABR port connection	2.2	0.34	1.8	0.27
		PAB port connection	2.4	0.29	2.4	0.29
M4GE3	2-position		3.5	0.34	2.6	0.27
	3-position	All ports blocked	3.1	0.33	3.3	0.22
		ABR port connection	3.0	0.30	2.7	0.22
		PAB port connection	3.6	0.36	3.3	0.28

Values for the built-in check valve apply for the 2-position, two 3 port valve integrated type and A/B/R connection.

5) Weight

●Individual valve

			With sub base / Without sub base								
			3GA1	3GA2	3GA3	4GA1	4GA2	4GA3	4GB1	4GB2	4GB3
2-position	single	grommet lead wire	58/44	115/85	162/120	58/44	120/90	171/129	79/37	154/72	214/95
		E-connector	60/46	117/87	164/122	60/46	122/92	173/131	81/39	156/74	216/97
		EJ-connector	76/62	133/103	180/138	76/62	154/124	205/163	97/55	188/106	248/129
		DIN terminal box	–	137/107	184/142	–	142/112	193/151	–	176/94	236/117
	double	grommet lead wire	–	–	–	73/59	135/105	187/141	94/52	169/87	230/111
		E-connector	–	–	–	77/63	139/109	191/145	98/56	173/91	234/115
		EJ-connector	–	–	–	93/79	171/141	223/177	114/72	205/123	266/147
		DIN terminal box	–	–	–	–	179/149	231/185	–	213/131	274/155
3-position		grommet lead wire	–	–	–	75/61	147/117	196/154	95/53	180/98	129/120
		E-connector	–	–	–	79/65	151/121	200/158	99/57	184/102	243/124
		EJ-connector	–	–	–	95/81	183/153	232/190	115/73	216/134	275/156
		DIN terminal box	–	–	–	–	191/161	240/198	–	224/141	283/164

・The model with two 3-port valves integrated is equivalent to 2-position, double.

・The wire-saving type (A2N) is equivalent to an E-type connector.

●Manifold base

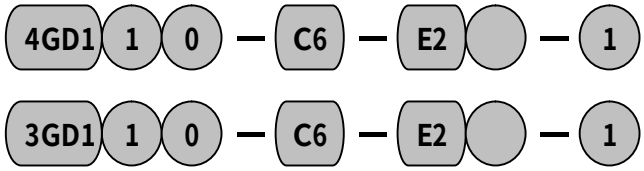
		M3GD1 M4GD1	M3GD2 M4GD2	M3GD3 M4GD3	M3GE1 M4GE1	M3GE2 M4GE2	M4GE3
Internal pilot	Direct mount	23n+52	47n+64	74n+88	35n+61	71n+106	113n+170
	DIN rail mount	25n+60	49n+92	76n+117	36n+115	73n+134	115n+119
External pilot	Direct mount	36n+105	88n+135	136n+194	35n+106	76n+135	118n+194
	DIN rail mount	38n+113	90n+163	138n+223	36n+114	78n+166	120n+223

・n represents the number of links.

・The connection gauge for the M4GE series is a value for screw specifications.

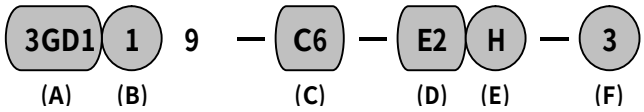
8.2 How to code model numbers

Discrete valve: Body porting



Discrete valve for base installation

Discrete 3 port valve for base installation



Symbol	Descriptions		(A) Model No 3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(B)	Operator type							
1	2-position single					●	●	●
2	2-position double					●	●	●
3	3-position all port blocked					●	●	●
4	3-position ABR connection					●	●	●
5	3-position PAB connection					●	●	●
1	2-position single solenoid N.C.		●	●	●			
11	2-position single solenoid N.O.		●	●	●			
66	Two 3 port valve integrated type	A side valve: normally closed	●	●				
		B side valve: normally closed						

(C)	Port size(A/B port)						
C4	φ4 push-in joint	●	●		●	●	
C6	φ6 push-in joint	●	●	●	●	●	●
C8	φ8 push-in joint		●	●		●	●
C10	φ10 push-in joint			●			●
M5	M5	●			●		
06	Rc1/8		●			●	
08	Rc1/4			●			●

Discontinue

Symbol	Descriptions	(A) Model No					
		3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(D) Electric wire connection							
Blank	Grommet lead wire(300mm)	●	●	●	●	●	●
B	DIN terminal box		●	●		●	●
E-connector (top/side common)							
E0	Lead wire(300mm)	●	●	●	●	●	●
E00	Lead wire(500mm)	●	●	●	●	●	●
E01	Lead wire(1000mm)	●	●	●	●	●	●
E02	Lead wire(2000mm)	●	●	●	●	●	●
E03	Lead wire(3000mm)	●	●	●	●	●	●
E2	Lead wire(300mm) surge absorber and lamp provided.	●	●	●	●	●	●
E20	Lead wire(500mm) surge absorber and lamp provided.	●	●	●	●	●	●
E21	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E22	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E23	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E0N	Non-lead wire(without socket)	●	●	●	●	●	●
E2N	Non-lead wire(without socket) surge absorber and lamp provided.	●	●	●	●	●	●
E3	Non-lead wire(socket and terminal attached) surge absorber and lamp provided.	●	●	●	●	●	●
E1	Non-lead wire(socket and terminal attached)	●	●	●	●	●	●
EJ-connector(socket with cover (top/side common))							
E01J	Lead wire(1000mm)	●	●	●	●	●	●
E02J	Lead wire(2000mm)	●	●	●	●	●	●
E03J	Lead wire(3000mm)	●	●	●	●	●	●
E21J	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E22J	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E23J	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●	●

(E) Option							
Blank	None	●	●	●	●	●	●
H	With check valve	●	●	●	●	●	●
P	Mounting plate	●	●	●	●	●	●
A	Ozone and coolant proof	●	●	●	●	●	●
F	P/A/B port filter integrated	●	●	●	●	●	●

(F) Voltage							
1	100 VAC	●	●	●	●	●	●
3	24 VDC	●	●	●	●	●	●
4	12 VDC	●	●	●	●	●	●

Discrete valve; sub-base porting

4GE1 1 0 — 06 — E2 — 3

3GE1 66 0 — 06 — E2 — 3

Discrete valve for base installation

4GE1 1 9 — 00 — E2 H — 3

Discrete 3 port valve for base installation

3GE1 66 9 — 00 — E2 H — 3

(A) (B) (C) (D) (E) (F)

Symbol	Descriptions		(A) Model No 3GE1	3GE2	4GE1	4GE2	4GE3
(B)	**Operator type**						
1	2-position single				●	●	●
2	2-position double				●	●	●
3	3-position all port blocked				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
66	Two 3 port valve integrated type	A side valve: normally closed	●	●			
		B side valve: normally closed					

(C)	**Port size(A/B port)**						
06	Rc1/8	●		●		
08	Rc1/4		●		●	●
10	Rc3/8					●

Discontinue

Symbol	Descriptions	(A) Model No				
		3GE1	3GE2	4GE1	4GE2	4GE3
(D)	Electric wire connection					
Blank	Grommet lead wire(300mm)	●	●	●	●	●
B	DIN terminal box		●		●	●
E-connector (top/side common)						
E0	Lead wire(300mm)	●	●	●	●	●
E00	Lead wire(500mm)	●	●	●	●	●
E01	Lead wire(1000mm)	●	●	●	●	●
E02	Lead wire(2000mm)	●	●	●	●	●
E03	Lead wire(3000mm)	●	●	●	●	●
E2	Lead wire(300mm) surge absorber and lamp provided.	●	●	●	●	●
E20	Lead wire(500mm) surge absorber and lamp provided.	●	●	●	●	●
E21	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●
E22	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●
E23	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●
E0N	Non-lead wire(without socket)	●	●	●	●	●
E2N	Non-lead wire(without socket) surge absorber and lamp provided.	●	●	●	●	●
E3	Non-lead wire(socket and terminal attached) surge absorber and lamp provided.	●	●	●	●	●
E1	Non-lead wire(socket and terminal attached)	●	●	●	●	●
EJ-connector(socket with cover (top/side common))						
E01J	Lead wire(1000mm)	●	●	●	●	●
E02J	Lead wire(2000mm)	●	●	●	●	●
E03J	Lead wire(3000mm)	●	●	●	●	●
E21J	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●
E22J	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●
E23J	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●
(E)	Option					
Blank	None	●	●	●	●	●
H	With check valve	●	●	●	●	●
A	Ozone and coolant proof	●	●	●	●	●
F	P/A/B port filter integrated	●	●	●	●	●
(F)	Voltage					
1	100 VAC	●	●	●	●	●
3	24 VDC	●	●	●	●	●
4	12 VDC	●	●	●	●	●

Individual wiring manifold; body porting

Manifold model no.

M 4GD1 1 0 — C6 — E2 H D — 10 — 3

3 port manifold model no.

M 3GD1 1 0 — C6 — E2 H D — 10 — 3

Discrete valve for base installation

4GD1 1 9 — C6 — E2 H ——— 3

Discrete 3 port valve for base installation

3GD1 1 9 — C6 — E2 H ——— 3

(A) (B) (C) (D) (E) (F) (G) (H)

Symbol	Descriptions		(A) Model No 3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(B)	**Operator type**							
1	2-position single					●	●	●
2	2-position double					●	●	●
3	3-position all port blocked					●	●	●
4	3-position ABR connection					●	●	●
5	3-position PAB connection					●	●	●
1	2-position single solenoid N.C.		●	●	●			
11	2-position single solenoid N.O.		●	●	●			
66	Two 3 port valve integrated type	A side valve: normally closed	●	●				
		B side valve: normally closed						
8	Mix manifold		●	●	●	●	●	●

(C)	**Port size(A/B port)**							
C4	φ4 push-in joint		●	●		●	●	
C6	φ6 push-in joint		●	●	●	●	●	●
C8	φ8 push-in joint			●	●		●	●
C10	φ10 push-in joint				●			●
CX	push-in joint mix		●	●	●	●	●	●
M5	M5		●			●		●
06	Rc1/8			●			●	
08	Rc1/4				●			●

Discontinue

Symbol	Descriptions	(A) Model No 3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(D) Electric wire connection							
Blank	Grommet lead wire(300mm)	●	●	●	●	●	●
B	DIN terminal box		●	●		●	●
E-connector (top/side common)							
E0	Lead wire(300mm)	●	●	●	●	●	●
E00	Lead wire(500mm)	●	●	●	●	●	●
E01	Lead wire(1000mm)	●	●	●	●	●	●
E02	Lead wire(2000mm)	●	●	●	●	●	●
E03	Lead wire(3000mm)	●	●	●	●	●	●
E2	Lead wire(300mm) surge absorber and lamp provided.	●	●	●	●	●	●
E20	Lead wire(500mm) surge absorber and lamp provided.	●	●	●	●	●	●
E21	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E22	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E23	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E0N	Non-lead wire(without socket)	●	●	●	●	●	●
E2N	Non-lead wire(without socket) surge absorber and lamp provided.	●	●	●	●	●	●
E3	Non-lead wire(socket and terminal attached) surge absorber and lamp provided.	●	●	●	●	●	●
E1	Non-lead wire(socket and terminal attached)	●	●	●	●	●	●
EJ-connector(socket with cover (top/side common))							
E01J	Lead wire(1000mm)	●	●	●	●	●	●
E02J	Lead wire(2000mm)	●	●	●	●	●	●
E03J	Lead wire(3000mm)	●	●	●	●	●	●
E21J	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E22J	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●	●
E23J	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●	●

(E) Option							
Blank	None	●	●	●	●	●	●
H	With check valve	●	●	●	●	●	●
A	Ozone and coolant proof	●	●	●	●	●	●
F	A/B port filter integrated	●	●	●	●	●	●
Z1	Supply spacer	●	●	●	●	●	●

(F) Mount type							
Blank	Direct mount	●	●	●	●	●	●
D	DIN rail mount type	●	●	●	●	●	●

(G) Station number							
2	2stations	●	●	●	●	●	●
⟆	⟆						
20	20stations						

(H) Voltage							
1	100 VAC	●	●	●	●	●	●
3	24 VDC	●	●	●	●	●	●
4	12 VDC	●	●	●	●	●	●

Individual wiring manifold; sub-base porting

Manifold model no.

M | 4GE1 | 1 | 0 — C6 — E2 | H | D — 10 — 3

3 port manifold model no.

M | 3GE1 | 66 | 0 — C6 — E2 | H | D — 10 — 3

Discrete valve for base installation

4GE1 | 1 | 9 — 00 — E2 | H ——— 3

Discrete 3 port valve for base installation

3GE1 | 66 | 9 — 00 — E2 | H ——— 3

(A) (B) (C) (D) (E) (F) (G) (H)

Symbol	Descriptions		(A) Model No 3GE1	3GE2	4GE1	4GE2	4GE3
(B)	**Operator type**						
1	2-position single				●	●	●
2	2-position double				●	●	●
3	3-position all port blocked				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
66	Two 3 port valve integrated type	A side valve: normally closed B side valve: normally closed	●	●			
8	Mix manifold		●	●	●	●	●

	(C) Port size(A/B port)					
C4	φ4 push-in joint	●	●	●	●	
C6	φ6 push-in joint	●	●	●	●	●
C8	φ8 push-in joint		●		●	●
C10	φ10 push-in joint					●
CL4	φ4 push-in joint L type(Upward)			●		
CL6	φ6 push-in joint L type(Upward)			●	●	
CL8	φ8 push-in joint L type(Upward)				●	●
CL10	φ10 push-in joint L type(Upward)					●
CD4	φ4 push-in joint L type(Downward)	●		●		
CD6	φ6 push-in joint L type(Downward)	●	●	●	●	
CD8	φ8 push-in joint L type(Downward)		●		●	●
CD10	φ10 push-in joint L type(Downward)					●
CX	push-in joint mix	●	●	●	●	●
M5	M5	●		●		
06	Rc1/8		●		●	
08	Rc1/4					●

Discontinue

Symbol	Descriptions	(A) Model No				
		3GE1	3GE2	4GE1	4GE2	4GE3
(D)	Electric wire connection					
Blank	Grommet lead wire(300mm)	●	●	●	●	●
B	DIN terminal box		●		●	●
E-connector (top/side common)						
E0	Lead wire(300mm)	●	●	●	●	●
E00	Lead wire(500mm)	●	●	●	●	●
E01	Lead wire(1000mm)	●	●	●	●	●
E02	Lead wire(2000mm)	●	●	●	●	●
E03	Lead wire(3000mm)	●	●	●	●	●
E2	Lead wire(300mm) surge absorber and lamp provided.	●	●	●	●	●
E20	Lead wire(500mm) surge absorber and lamp provided.	●	●	●	●	●
E21	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●
E22	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●
E23	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●
E0N	Non-lead wire(without socket)	●	●	●	●	●
E2N	Non-lead wire(without socket) surge absorber and lamp provided.	●	●	●	●	●
E3	Non-lead wire(socket and terminal attached) surge absorber and lamp provided.	●	●	●	●	●
E1	Non-lead wire(socket and terminal attached)	●	●	●	●	●
EJ-connector(socket with cover (top/side common))						
E01J	Lead wire(1000mm)	●	●	●	●	●
E02J	Lead wire(2000mm)	●	●	●	●	●
E03J	Lead wire(3000mm)	●	●	●	●	●
E21J	Lead wire(1000mm) surge absorber and lamp provided.	●	●	●	●	●
E22J	Lead wire(2000mm) surge absorber and lamp provided.	●	●	●	●	●
E23J	Lead wire(3000mm) surge absorber and lamp provided.	●	●	●	●	●
(E)	Option					
Blank	None	●	●	●	●	●
H	With check valve	●	●	●	●	●
A	Ozone and coolant proof	●	●	●	●	●
F	A/B port filter integrated	●	●	●	●	●
Z1	Supply spacer	●	●	●	●	●
(F)	Mount type					
Blank	Direct mount	●	●	●	●	●
D	DIN rail mount type	●	●	●	●	●
(G)	Station number					
2	2stations	●	●	●	●	●
⟆	⟆					
20	20stations					
(H)	Voltage					
1	100 VAC	●	●	●	●	●
3	24 VDC	●	●	●	●	●
4	12 VDC	●	●	●	●	●

Reduced wiring manifold; body porting

Manifold model no.

M | 4GD1 | 1 | 0 — | C6 — | T30 | W | H | D — | 10 — | 3

3 port manifold model no.

M | 3GD1 | 1 | 0 — | C6 — | T30 | W | H | D — | 10 — | 3

Discrete valve for base installation

4GD1 | 1 | 9 — | C6 — | A2N | H | 3

Discrete 3 port valve for base installation

3GD1 | 1 | 9 — | C6 — | A2N | H | 3

(A) (B) (C) (D) (E) (F) (G) (H) (I)

Symbol	Descriptions		(A) Model No 3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(B)	**Operator type**							
1	2-position single					●	●	●
2	2-position double					●	●	●
3	3-position all port blocked					●	●	●
4	3-position ABR connection					●	●	●
5	3-position PAB connection					●	●	●
1	2-position single solenoid N.C.		●	●	●			
11	2-position single solenoid N.O.		●	●	●			
66	Two 3 port valve integrated type	A side valve: normally closed	●	●				
		B side valve: normally closed						
8	Mix manifold		●	●	●	●	●	●

(C)	**Port size(A/B port)**							
C4	φ4 push-in joint		●	●		●	●	
C6	φ6 push-in joint		●	●	●	●	●	●
C8	φ8 push-in joint			●	●		●	●
C10	φ10 push-in joint				●			●
CX	push-in joint mix		●	●	●	●	●	●
M5	M5		●			●		
06	Rc1/8			●			●	
08	Rc1/4				●			●

Symbol	Descriptions		(A) Model No					
			3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(D) Reduced wiring (light, surge absorber provided as standard)								
T10	Common gland (M3 screw)	Left	●	●	●	●	●	●
T10R		Right	●	●	●	●	●	●
T11	Common gland (push-in fitting)	Left	●	●	●	●	●	●
T11R		Right	●	●	●	●	●	●
T30	D sub-connector	Left	●	●	●	●	●	●
T30R		Right	●	●	●	●	●	●
T50	20 pin flat cable connector (with power supply terminal)	Left	●	●	●	●	●	●
T50R		Right	●	●	●	●	●	●
T51	20 pin flat cable connector (without power supply terminal)	Left	●	●	●	●	●	●
T51R		Right	●	●	●	●	●	●
T52	10 pin flat cable connector (without power supply terminal)	Left	●	●	●	●	●	●
T52R		Right	●	●	●	●	●	●
T53	26 pin flat cable connector (without power supply terminal)	Left	●	●	●	●	●	●
T53R		Right	●	●	●	●	●	●
(E) Terminal/connector pin array								
Blank	Standard wiring		●	●	●	●	●	●
W	Double wiring		●	●	●	●	●	●
(F) Option								
Blank	None		●	●	●	●	●	●
H	With check valve		●	●	●	●	●	●
A	Ozone and coolant proof		●	●	●	●	●	●
F	A/B port filter integrated		●	●	●	●	●	●
Z1	Supply spacer		●	●	●	●	●	●
(G) Mount type								
Blank	Direct mount		●	●	●	●	●	●
D	DIN rail mount type		●	●	●	●	●	●
(H) Station number								
2	2stations		●	●	●	●	●	●
⟆	⟆							
20	20stations							
(I) Voltage								
3	24 VDC		●	●	●	●	●	●
4	12 VDC		●	●	●	●	●	●

Reduced wiring manifold; body porting; serial transmission

Manifold model no.

M | 4GD1 | 1 | 0 — C6 — T6A0 | W | H | D — 10 — 3

3 port manifold model no.

M | 3GD1 | 1 | 0 — C6 — T6A0 | W | H | D — 10 — 3

Discrete valve for base installation

4GD1 | 1 | 9 — C6 — A2N | H | —— | 3

Discrete 3 port valve for base installation

3GD1 | 1 | 9 — C6 — A2N | H | —— | 3

(A) (B) (C) (D) (E) (F) (G) (H)

Symbol	Descriptions		(A) Model No 3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(B)	**Operator type**							
1	2-position single					●	●	●
2	2-position double					●	●	●
3	3-position all port blocked					●	●	●
4	3-position ABR connection					●	●	●
5	3-position PAB connection					●	●	●
1	2-position single solenoid N.C.		●	●	●			
11	2-position single solenoid N.O.		●	●	●			
66	Two 3 port valve integrated type	A side valve: normally closed	●	●				
		B side valve: normally closed						
8	Mix manifold		●	●	●	●	●	●

(C)	**Port size(A/B port)**							
C4	φ4 push-in joint		●	●		●	●	
C6	φ6 push-in joint		●	●	●	●	●	●
C8	φ8 push-in joint			●	●		●	●
C10	φ10 push-in joint				●			●
CX	push-in joint mix		●	●	●	●	●	●
M5	M5		●			●		
06	Rc1/8			●			●	
08	Rc1/4				●			●

Discontinue

Symbol	Descriptions	(A) Model No					
		3GD1	3GD2	3GD3	4GD1	4GD2	4GD3
(D)	**Serial transmission (light and surge absorber provided as standard)**						
T6A0	UNIWIRE SYSTEM 8 points	●	●	●	●	●	●
T6A1	UNIWIRE SYSTEM 16 points	●	●	●	●	●	●
T6C0	OMRON CompoBus/S 8 points	●	●	●	●	●	●
T6C1	OMRON CompoBus/S 16 points	●	●	●	●	●	●
T6E0	SUNX S-LINK 8 points	●	●	●	●	●	●
T6E1	SUNX S-LINK 16 points	●	●	●	●	●	●
T6G1	CC-Link	●	●	●	●	●	●
T6J0	UNIWIRE H SYSTEM 8 points	●	●	●	●	●	●
T6J1	UNIWIRE H SYSTEM 16 points	●	●	●	●	●	●
(E)	**Terminal/connector pin array**						
Blank	Standard wiring	●	●	●	●	●	●
W	Double wiring	●	●	●	●	●	●
(F)	**Option**						
Blank	None	●	●	●	●	●	●
H	With check valve	●	●	●	●	●	●
A	Ozone and coolant proof	●	●	●	●	●	●
F	A/B port filter integrated	●	●	●	●	●	●
Z1	Supply spacer	●	●	●	●	●	●
(G)	**Station number**						
2	2stations	●	●	●	●	●	●
⟆	⟆						
16	16stations						
(H)	**Voltage**						
3	24 VDC	●	●	●	●	●	●

Reduced wiring manifold; sub-base porting

Manifold model no.

M | 4GE1 | 1 | 0 — | C6 | — | T30 | W | H | D | — | 10 | — | 3

3 port manifold model no.

M | 3GE1 | 66 | 0 — | C6 | — | T30 | W | H | D | — | 10 | — | 3

Discrete valve for base installation

4GE1 | 1 | 9 — | 00 | — | A2N | H | ——— | 3

Discrete 3 port valve for base installation

3GE1 | 66 | 9 — | 00 | — | A2N | H | ——— | 3

(A) (B) (C) (D) (E) (F) (G) (H) (I)

Symbol	Descriptions		(A) Model No 3GE1	3GE2	4GE1	4GE2	4GE3
(B)	**Operator type**						
1	2-position single				●	●	●
2	2-position double				●	●	●
3	3-position all port blocked				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
66	Two 3 port valve integrated type	A side valve: normally closed	●	●			
		B side valve: normally closed					
8	Mix manifold		●	●	●	●	●

(C)	**Port size(A/B port)**						
C4	φ4 push-in joint	●	●	●	●		
C6	φ6 push-in joint	●	●	●	●	●	
C8	φ8 push-in joint		●		●	●	
C10	φ10 push-in joint					●	
CL4	φ4 push-in joint L type(Upward)			●			
CL6	φ6 push-in joint L type(Upward)			●	●		
CL8	φ8 push-in joint L type(Upward)				●	●	
CL10	φ10 push-in joint L type(Upward)					●	
CD4	φ4 push-in joint L type(Downward)	●		●			
CD6	φ6 push-in joint L type(Downward)	●	●	●	●		
CD8	φ8 push-in joint L type(Downward)		●		●	●	
CD10	φ10 push-in joint L type(Downward)					●	
CX	push-in joint mix	●	●	●	●	●	
M5	M5	●		●			
06	Rc1/8		●		●		
08	Rc1/4					●	

Symbol	Descriptions		(A) Model No				
			3GE1	3GE2	4GE1	4GE2	4GE3
(D) Reduced wiring (light, surge absorber provided as standard)							
T10	Common gland (M3 screw)	Left	●	●	●	●	●
T10R		Right	●	●	●	●	●
T11	Common gland (push-in fitting)	Left	●	●	●	●	●
T11R		Right	●	●	●	●	●
T30	D sub-connector	Left	●	●	●	●	●
T30R		Right	●	●	●	●	●
T50	20 pin flat cable connector (with power supply terminal)	Left	●	●	●	●	●
T50R		Right	●	●	●	●	●
T51	20 pin flat cable connector (without power supply terminal)	Left	●	●	●	●	●
T51R		Right	●	●	●	●	●
T52	10 pin flat cable connector (without power supply terminal)	Left	●	●	●	●	●
T52R		Right	●	●	●	●	●
T53	26 pin flat cable connector (without power supply terminal)	Left	●	●	●	●	●
T53R		Right	●	●	●	●	●
(E) Terminal/connector pin array							
Blank	Standard wiring		●	●	●	●	●
W	Double wiring		●	●	●	●	●
(F) Option							
Blank	None		●	●	●	●	●
H	With check valve		●	●	●	●	●
A	Ozone and coolant proof		●	●	●	●	●
F	A/B port filter integrated		●	●	●	●	●
Z1	Supply spacer		●	●	●	●	●
(G) Mount type							
Blank	Direct mount		●	●	●	●	●
D	DIN rail mount type		●	●	●	●	●
(H) Station number							
2	2stations		●	●	●	●	●
⟆	⟆						
20	20stations						
(I) Voltage							
3	24 VDC		●	●	●	●	●
4	12 VDC		●	●	●	●	●

Reduced wiring manifold; sub-base porting; serial transmission

Manifold model no.

M | 4GE1 | 1 | 0 — | C6 | — | T6A0 | W | H | D | — | 10 | — | 3

3 port manifold model no.

M | 3GE1 | 66 | 0 — | C6 | — | T6C0 | W | H | D | — | 10 | — | 3

Discrete valve for base installation

4GE1 | 1 | 9 — | 00 | — | A2N | H | —— | 3

Discrete 3 port valve for base installation

3GE1 | 66 | — | 00 | — | A2N | H | —— | 3

(A) (B) (C) (D) (E) (F) (G) (H)

Symbol	Descriptions		(A) Model No 3GE1	3GE2	4GE1	4GE2	4GE3
(B)	**Operator type**						
1	2-position single				●	●	●
2	2-position double				●	●	●
3	3-position all port blocked				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
66	Two 3 port valve integrated type	A side valve: normally closed B side valve: normally closed	●	●			
8	Mix manifold		●	●	●	●	●

(C)	Port size(A/B port)					
C4	φ4 push-in joint	●	●	●	●	
C6	φ6 push-in joint	●	●	●	●	●
C8	φ8 push-in joint		●		●	●
C10	φ10 push-in joint					●
CL4	φ4 push-in joint L type(Upward)			●		
CL6	φ6 push-in joint L type(Upward)			●	●	
CL8	φ8 push-in joint L type(Upward)				●	●
CL10	φ10 push-in joint L type(Upward)					●
CD4	φ4 push-in joint L type(Downward)	●		●		
CD6	φ6 push-in joint L type(Downward)	●	●	●	●	
CD8	φ8 push-in joint L type(Downward)		●		●	●
CD10	φ10 push-in joint L type(Downward)					●
CX	push-in joint mix	●	●	●	●	●
M5	M5	●		●		
06	Rc1/8		●		●	
08	Rc1/4					●

Discontinue

Symbol	Descriptions	(A) Model No				
		3GE1	3GE2	4GE1	4GE2	4GE3
(D)	**Serial transmission (light and surge absorber provided as standard)**					
T6A0	UNIWIRE SYSTEM 8 points	●	●	●	●	●
T6A1	UNIWIRE SYSTEM 16 points	●	●	●	●	●
T6C0	OMRON CompoBus/S 8 points	●	●	●	●	●
T6C1	OMRON CompoBus/S 16 points	●	●	●	●	●
T6E0	SUNX S-LINK 8 points	●	●	●	●	●
T6E1	SUNX S-LINK 16 points	●	●	●	●	●
T6G1	CC-Link	●	●	●	●	●
T6J0	UNIWIRE H SYSTEM 8 points	●	●	●	●	●
T6J1	UNIWIRE H SYSTEM 16 points	●	●	●	●	●
(E)	**Terminal/connector pin array**					
Blank	Standard wiring	●	●	●	●	●
W	Double wiring	●	●	●	●	●
(F)	**Option**					
Blank	None	●	●	●	●	●
H	With check valve	●	●	●	●	●
A	Ozone and coolant proof	●	●	●	●	●
F	A/B port filter integrated	●	●	●	●	●
Z1	Supply spacer	●	●	●	●	●
(G)	**Station number**					
2	2stations	●	●	●	●	●
⟆	⟆					
16	16stations					
(H)	**Voltage**					
3	24 VDC	●	●	●	●	●

8.3 Option

1) Explanation of option

・With check valve: Symbol “H” Refer to 5.1 section.

To prevent malfunction due to introduction of back pressure, a gasket with a malfunction prevention valve can be selected.

・Mounting plate: symbol "P" Refer to 4.2.3 section.

This is used to mount a valve horizontally on the mounting surface, and dedicated to the direct piping type.

・Ozone and coolant proof : Symbol “A”

Set it if the coolant flows in the valve.

The rubber material of the major section of the solenoid valve is changed to the fluorine-containing rubber.

・With built-in A/B port filter : Symbol “F”

The filter prevents the cutting chips and pieces of tape from entering the valve.

・With supply spacer : Symbol “Z1” Refer to section 8.5

This option symbol indicates a manifold assembly equipped with the supply spacer.

The supply port can be provided to each valve.

Use this option when supply air with different pressures depending on the valve.

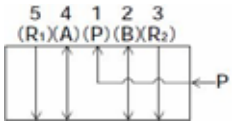
Specifications

Model	Flow characteristics Note 1,2				Weight [g]
	1(P)→4(A)/2(B)		4(A)/2(B)→3/5(R)		
	C[dm3/(s/bar)]	B	C[dm3/(s/bar)]	b	
4G1	0.70	0.23	0.93	0.16	8
4G2	1.6	0.17	1.8	0.16	35
4G3	2.6	0.22	3.1	0.14	56

Note 1 This is a value when a valve is mounted.

Note 2 Effective sectional area S and sonic conductance C are converted as S □ 5.0 x C.

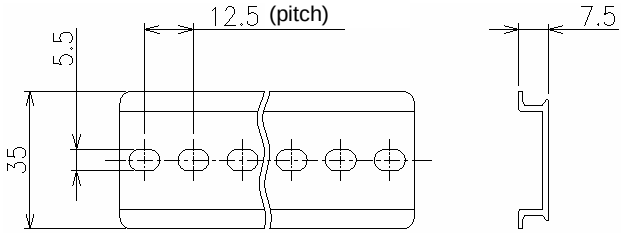
JIS symbol



8.4 Accessories

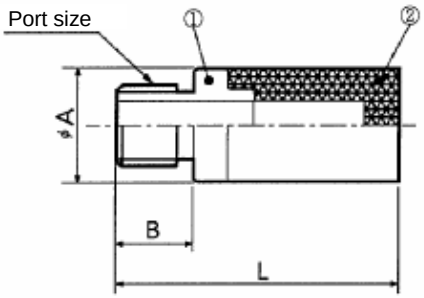
1) Mounting rail

All the angular corners are rounded. The mounting rail is cut at a mounting pitch of 12.5 mm.

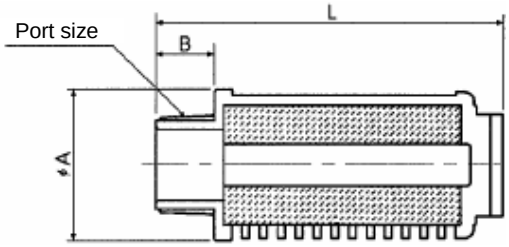


2) Silencer

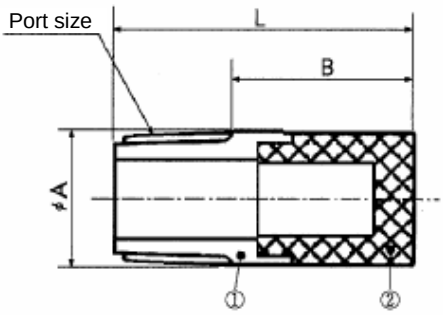
●SLM-M5



●SLW-6A･8A･10A･8L･10L

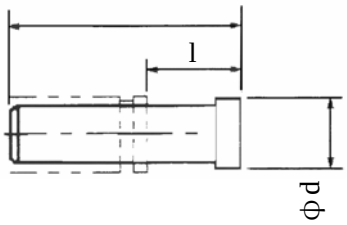


●SLW-6S･8S



Model	L	B	φA	Port size	Effective sectional area mm²
SLM-M5	16.5	4.5	7	M5	5
SLW-6A	34.5	6.5	16.5	R1/8	10
SLW-8A	44.5	8.5	20	R1/4	20
SLW-10A	58.5	10	25.5	R3/8	30
SLW-8L	57.4	8.9	25.5	R1/4	30
SLW-10L	69	10	28	R3/8	60
SLW-6S	22	13.3	10.5	R1/4	12
SLW-8S	28	19	15.4	R3/8	30

3) Blank plug



Model	D	L	l	d
GWP4-B	φ4	27	12	6
GWP6-B	φ6	29	12.5	8
GWP8-B	φ8	33	14	10
GWP10-B	φ10	40	18.5	12

4) Pipe plug

4G1-M5

4G*-*P

Model	Nominal designation of thread
4G1－M5	M5
4G2－06P	Rc1/8
4G3－08P	Rc1/4

8. 5 Kit parts

1) Commodity

Part name	Model
Coil assembly	4G-Wiring type - Option - COIL - Voltage Voltage: 1 : AC100V / 3 : DC24V / 4 : DC12V Option: Blank : standard type / A : Ozone-resistant Wiring type: Blank : Grommet lead wire / E* : E-type connector / E*J : EJ-type connector / A2N : A-type connector / B : DIN terminal box
E-connector assembly	4G－SOCKET－ASSY－Electric wire connection－Voltage Voltage: 1：AC100V / 3：DC24V / 4：DC12V Electric wire connection: blank ： EJ-connector / E* ：E-connector / E*J ：EJ-connector
DIN terminal box	4G-TERMINAL-BOX-Voltage

2) Cartridge type push-in joint

Model name	Description	Model
4G1	φ4 straight	4G1-JOINT-C4
4G1	φ6 straight	4G1-JOINT-C6
4G1	φ4 Elbow short	4G1-JOINT-CL4
4G1	φ4 Elbow long	4G1-JOINT-CLL4
4G1	φ6 Elbow short	4G1-JOINT-CL6
4G1	φ6 Elbow long	4G1-JOINT-CLL6
4G1	Plug cartridge	4G1-JOINT-CPG
4G2	φ4 straight	4G2-JOINT-C4
4G2	φ6 straight	4G2-JOINT-C6
4G2	φ8 straight	4G2-JOINT-C8
4G2	φ6 Elbow short	4G2-JOINT-CL6
4G2	φ6 Elbow long	4G2-JOINT-CLL6
4G2	φ8 Elbow short	4G2-JOINT-CL8
4G2	φ8 Elbow long	4G2-JOINT-CLL8
4G2	Plug cartridge	4G2-JOINT-CPG
4G3	φ6 straight	4G3-JOINT-C6
4G3	φ8 straight	4G3-JOINT-C8
4G3	φ10 straight	4G3-JOINT-C10
4G3	φ8 Elbow short	4G3-JOINT-CL8
4G3	φ8 Elbow long	4G3-JOINT-CLL8
4G3	φ10 Elbow short	4G3-JOINT-CL10
4G3	φ10 Elbow long	4G3-JOINT-CLL10
4G3	Plug cartridge	4G3-JOINT-CPG

3) Masking plate kit

Model name	Model	Description
4G1	4G1-MP	1 Masking plate 1 Gasket 2 Mounting screws
4G2	4G2-MP	
4G3	4G3-MP	

4) Mounting plate kit

Model name	Model	Description
4G1	4G1-MOUNT-PLATE-KIT	1 Mounting plate, 2 Mounting screws, 2 Nut
4G2	4G2-MOUNT-PLATE-KIT	1 Mounting plate, 2 Mounting screws
4G3	4G3-MOUNT-PLATE-KIT	1 Mounting plate, 2 Mounting screws

5) DIN rail kit

Model name	Model	Description
4G1	4G1-BAA [*1]－D	1 DIN rail, 2 Mounting screws
4G2	4G2-BAA [*1]－D	1 DIN rail, 2 Holder, 2 Mounting screws, 2 Mounting screw for holder
4G3	4G3-BAA [*1]－D	1 DIN rail, 2 Holder, 2 Mounting screws, 2 Mounting screws for holder

* 1: Filled in with a DIN rail length. The length is selected from the table below. If no DIN rail is necessary, enter “0”.

Table DIN rail length

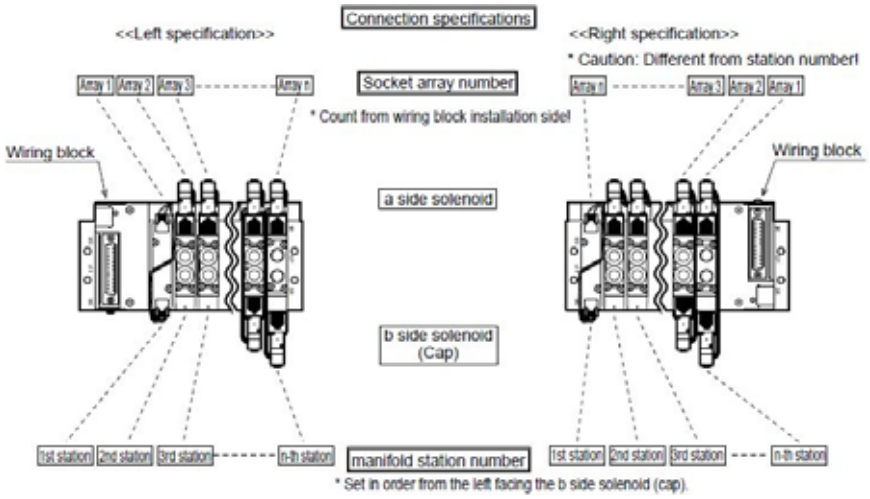
Rail length	Mounting pitch
87.5	75
100	87.5
112.5	100
125	112.5
137.5	125
150	137.5
162.5	150
175	162.5
187.5	175
200	187.5
212.5	200
225	212.5
237.5	225
250	237.5
262.5	250
275	262.5
287.5	275
300	287.5
312.5	300
325	312.5
337.5	325
350	337.5
362.5	350
375	362.5
387.5	375
400	387.5

6) Reduced-wiring socket ass'y A

4G1 − SOCKET-ASSY − A R A − 2

- 4G1 or 4G2 or 4G3 : Series
- Blank or R : Connection type
- A or B : Solenoid position
- 2ND row to 24th row : Socket row number

The wire-saving socket assembly A is used for manifold wiring.
To install additional manifold wiring, select a cable with a length suitable for the installation position. If not selected correctly, this may cause wire breakage and/or cable jam.
The installation position shall be counted "in the number of columns" from an applicable electric component block. The counting method is different from that of manifold valve sequential numbers.
(The manifold sequential numbers are counted from the left, with the solenoid side being towards you.)



7) Air supply spacer

Air supply spacer model no.

4G 2 _ P _ GWS6

(A) (B)

Symbol	Descriptions	Valve model no. 4GD1	4GE1	4GD2	4GE2	4GD3	4GE3
(A)	Air supply spacer model no.						
1	4G1	●					
2	4G2			●			
3	4G3					●	
(B)	Port size						
Blank	M5 (4G1), Rc thread (4G2/4G3)	Note 1 ●		Note 1 ●		Note 1 ●	
GWS4	φ4 joint	●					
GWS6	φ6 joint	●		●			
GWS8	φ8 joint			●		●	
GWS10	φ10 joint					●	

Note on model no. selection

Note 1:No symbol indicates 4G1: M5 , 4G2: Rc1/8 , 4G3: Rc1/4.

Precautions for mounting a manifold

Note 1:Designate the supply spacer's mounting location and quantity in individual catalog manifold specifications.

Note 2:This is not applicable to mounting of a manifold in combination with a masking plate.

8) PR check valves kit

Model name	Model	Description
4G1	4G1-PR	2 PR check valves (for one unit)
4G2	4G2-PR	
4G3	4G3-PR	

9) Gasket with a malfunction prevention valve kit

Model name	Model	Description
4G1	4G1-CHECK-VALVE	1 Gasket with check valve
4G2	4G2-CHECK-VALVE	
4G3	4G3-CHECK-VALVE	

10) Gasket kit

Model name	Model	Description
4G1	4G1-GASKET	1 Gasket (for solenoid valve)
	4G1-MP-GASKET	1 Gasket (for masking plate)
4G2	4G2-GASKET	1 Gasket (for solenoid/masking plate common)
4G3	4G3-GASKET	

11)Mounting screws (For mounting a solenoid valve, One set: 10 screws)

Model name	Model	Description
4G1	4G1-SET-SCREW	10 Mounting screws (for 5 units)
4G2	4G2-SET-SCREW	
4G3	4G3-SET-SCREW	

12) Joint stopper kit (for base porting valve)

Model name	Model	Description
4G1	4G1-JNT-STP-PLATE-KIT	1 Joint stopper plate, 2 Mounting screws
4G2	4G2-JNT-STP-PLATE-KIT	
4G3	4G3-JNT-STP-PLATE-KIT	

13) Piping adaptor (for body porting valve)

Model name	Model	Description
4G1	4G1-ADAPTOR-M5-[*2]	1 Piping adaptor
4G2	4G2-ADAPTOR-06-[*2]	
4G3	4G3-ADAPTOR-08-[*2]	

* 2 F: Equipped with an A/B port filter, No symbols: No A/B port filter (standard)

14) Sub base (for base porting type)

Model name	Model	Description
4G1	4G1-SUB-BASE-06-[*2]	1 Sub base
4G2	4G2-SUB-BASE-08-[*2]	
4G3	4G3-SUB-BASE-[*1]-[*2]	

* 1 08: Port size Rc1/4, 10...Port size Rc3/8
* 2 F: Equipped with an A/B port filter, No symbols: No A/B port filter (standard)

15) Manifold base (Body porting valve, Individual wiring type)

Model name	Model	Description
4G1	M4GA1-00-[*4]	1 Manifold, 3 Pipe plugs
4G2	M4GA2-00-[*4]	
4G3	M4GA3-00-[*4]	

* 4 No. of stations. Refer to 8.2 section.

16) Manifold base (Body porting , Fewer wiring)

Model name	Model	Description
4G1	M4GA1-00-[*3]-[*4]	1 Manifold, 3 Pipe plugs
4G2	M4GA2-00-[*3]-[*4]	
4G3	M4GA3-00-[*3]-[*4]	

* 3 Reduced wiring. Refer to 8.2 section.
* 4 No. of stations. Refer to 8.2 section.

17) Manifold base (Body porting , Serial transmission slave unit)

Model name	Model	Description
4G1	M4GA1-00-T56-[*4]	1 Manifold, 3 Pipe plugs
4G2	M4GA2-00-T56-[*4]	
4G3	M4GA3-00-T56-[*4]	

*4 No. of stations. Refer to 8.2 section.
Note: A slave station is obtained separately.

18) Manifold base (Base piping , Individual wiring)

Model name	Model	Description
4G1 Note 1	M4GB1-[*1]-[*3]-[*4]	1 Manifold, 3 Pipe plugs
	M4GB1-[*1]-[*3]D-[*4]	
4G2	M4GB2-[*1]-[*3]-[*4]	
4G3	M4GB3-[*1]-[*3]-[*4]	

* 1 Port size. Refer to 8.2 section.。Note that “CX” cannot be selected.
* 3 F: Equipped with an A/B port filter, No symbols: No A/B port filter (standard)
* 4 No. of stations. Refer to 8.2 section.

Note 1 The manifold base to be mounted on a DIN rail needs to have symbol ”D”. The DIN rail kit shall be obtained separately.

19) Manifold base (base piping , Reduced wiring)

Model name	Model	Description
4G1	M4GB1-[*1]-[*2]-[*3]-[*4]	1 Manifold, 3 Pipe plug
4G2	M4GB2-[*1]-[*2]-[*3]-[*4]	
4G3	M4GB3-[*1]-[*2]-[*3]-[*4]	

* 1 Port size. Refer to 8.2 section. Note that “CX” cannot be selected.
* 2 Reduced wiring. Refer to 8.2 section.
* 3 F: Equipped with an A/B port filter, No symbols: No A/B port filter (standard)
* 4 No. of stations. Refer to 8.2 section.

20) Manifold base (Base piping , Serial transmission slave unit)

Model name	Model	Description
4G1	M4GB1-[*1]-T56-[*3]-[*4]	1 Manifold, 3 Pipe plug
4G2	M4GB2-[*1]-T56-[*3]-[*4]	
4G3	M4GB3-[*1]-T56-[*3]-[*4]	

* 1 Port size. Refer to 8.2 section. Note that “CX” cannot be selected.
* 3 F: Equipped with an A/B port filter, No symbols: No A/B port filter (standard)
* 4 No. of stations. Refer to 8.2 section.

Note: A slave station is obtained separately.

21) Gasket for coil assembly

Model	Description
4G-COIL-GASKET	1 Gasket

22) Mounting screw for coil assembly (One set: 10 screws)

Model	Description
4G-COIL-SET-SCREW	10 Mounting screws (for 5 units)

23) Serial transmission slave unit

Wiring type	Model	Description
T6A0	4G-OPP3-0A	1 Slave unit
T6A1	4G-OPP3-1A	
T6C0	4G-OPP3-0C	
T6C1	4G-OPP3-1C	
T6E0	4G-OPP3-0E	
T6E1	4G-OPP3-1E	
T6G1	4G-OPP3-1G	
T6J0	4G-OPP3-0J	
T6J1	4G-OPP3-1J	

24) DIN rail

Model	Description
N4G-BAA[*1]	1 DIN rail

*1: DIN rail cut length, 7) Select from the DIN rail kit table.