Discontinue

CKD

SM-P00029-A/3

Instruction Manual

Pneumatic 5-port solenoid valve

4GA4·4GB4-series

- Before operating this product, always thoroughly read this instruction manual.
- In particular, carefully read the contents related to operational safety to fully understand them.
- Always keep this manual in a safe place where all concerned personnel can refer to it immediately.

CKD Corporation

To safely operate this product:

To safely operate this product, the basic knowledge (SO4414 *1 JIS B 8370 *2) about pneumatic devices including materials, piping, electricity, and mechanism is absolutely required.

CKD shall not be held responsible for accidents arising from improper operation made by personnel who do not have any proper knowledge.

Since the customers have wide-ranging operation applications, CKD cannot grasp all applications. If the product cannot be operated at its optimal operating level according to the operating conditions, this may lead to a serious accident.
Therefore, the customer must fully understand the specifications and operations of the product to determine an appropriate model.

Even though various safety measures are taken for this product, improper operation made by the customer may lead to a serious accident.
To prevent such accidents, **thoroughly read this instruction manual to fully understand its contents before starting operation of this product.**
Since warning labels are provided in addition to the handling precautions stated in this instruction manual, carefully observe the following instructions.

To identify the dangers and possible hazards, the warning labels are classified into three groups, "CAUTION", WARNING", and "DANGER as described below.

DANGER : This denotes immediate hazards which WILL result in severe personal injury or death, if not avoided.

WARNING : This denotes hazards which COULD result in severe personal injury or death, if not avoided.

CAUTION : This denotes hazards which COULD result in minor personal injury and/or product or property damage, if not avoided

*1) ISO 4414 : Pneumatic fluid power ··· Recommendations for the application of equipment to transmission and control systems.

*2)JIS B 8370 : General rules for pneumatic systems

Unpacking (Section 3)

CAUTION:

Do not open the solenoid valve packaging bag until the piping work is started.

- If the packaging bag is opened before starting the piping connection work, foreign matter may enter the inside of the solenoid valve through the piping port, causing a trouble or malfunction.

Installation (Section 4)

WARNING:

If the customer wants to use this product for special operation or application other than those described in the specifications, always contact CKD.

Installation environment (Section 4.1)

CAUTION:

a) If a large amount of fine particle exists around the work place, should be carefully checked the exhaust piping.

- Respiration may occur at the exhaust port of the solenoid valve caused by activation of the valve body to suck foreign matter around the exhaust port. If the exhaust port is faced upward, foreign matter may enter.

To prevent these troubles, mount the silencer or make the piping of the exhaust port faced downward.

b) Do not splash the water or cutting oil directly onto the product.

- If the water or cutting oil is directly splashed onto the solenoid valve, this may cause electric leak or coil burnt-out.

Check the sealing ability beforehand and install the product inside the cover or panel to protect it when necessary.

C) The coil heats up when electrified.

- If this product is mounted inside the control panel or if it is powered ON for an extended period of time, consider appropriate heat radiation measures, such as ventilation. Failure to follow this caution may put the product in a high-temperature status.

d) This product cannot be operated in a corrosive or solvent environment.

- Do not use this product in the corrosive gas, such as sulfur dioxide or the solvent atmosphere.

e) Vibration resistance and Shock resistance

- Do not apply a vibration of 50m/s^2 or more or an impact of 300m/s^2 or more to the product.
- When mounting the product on the DIN rail, do not apply a vibration of 30m/s^2 or more or an impact of 150m/s^2 or more to the product.

f) In a high-humidity environment, dew condensation may occur as the temperature is changed. Therefore, do not operate this product in such environment.

g) This product cannot be used in an explosion environment

At this time, always select an explosion-proof solenoid valve.

Installation (Section 4.2)

WARNING:

When mounting the solenoid valve, do not support it by the piping.

·Mount the solenoid valve body and fix it firmly.

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) When connecting the piping, tighten it with a proper torque.

- This is intended to prevent the air leak or screw breakage. To prevent the screw thread from being scratched, first tighten the piping manually, and then tighten it firmly with tools.

b) Connect the piping firmly so that the coupling of the piping connection is not disconnected due to movement, vibration, or tension of the system.

- If the piping on the exhaust side of the pneumatic circuit is disengaged, the speed of the actuator cannot be controlled.
- In the case of chuck holding mechanism, the chuck is released, resulting in a dangerous status.

c) When supplying the compressed air after the piping connection has been completed, always check that no air leaks from all parts of the piping connection.

d) When supplying the compressed air after the piping connection has been completed, supply the air so that the high pressure is not applied rapidly.

- Otherwise the piping connection may be disconnected and the piping tube may jump up to cause a serious accident.

e) Do not throttle the exhaust port of the solenoid valve to the port diameter or less of the piping connection port.

- If the exhaust is not smooth, the actuator is not activated correctly. When using the manifold, this may hinder the correct operation of other solenoid valve.

f) Removal of foreign matter

- Foreign matter inside the piping, such as rust may cause operation fault or leak from the valve seat. Put a filter with a size of 5 μm or less at a position just before the solenoid valve.

g) Air supply

- Do not throttle the supply piping. When multiple valves are operated, the pressure drops, causing an operation delay fault.

Wiring (Section 4.4)

WARNING:

Before starting the electric wiring work, thoroughly read the instruction manual to fully understand its contents.
After that, perform the disassembly and assembly work properly.

- Knowledge to maintain the safety based on understanding the structure of the solenoid valve and the operation principle is absolutely required.

CAUTION:

a) Before supplying the power, check the power supply voltage and the current type (AC or DC).
b) Do not apply stress to the lead wires.
- Undue stress may cause such problems as a break in the wire or disconnection of the contact terminal.

Manual operation (Section 5.2)

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.

Make sure that the lock is released (OFF status). In the 4GA/B4-series, when the manual cover is closed, this shows the status that the lock is released.

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

Air quality (Section 5.3)

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 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 oilless valve is lubricated, the oilless function cannot be maintained.

When lubricating the oilless 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.

Electric circuit (Selection 5.4)

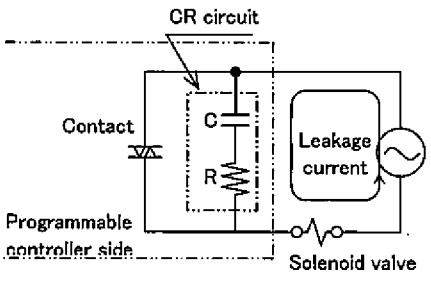
CAUTION:

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 and the 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.



100VAC	3.0 mA or less
12VDC	1.5 mA or less
24VDC	1.8 mA or less

Discontinue

CAUTION:

a) The surge killer functions to restrict a solenoid valve surge voltage of several hundred V to a low voltage level, at which the output contact can withstand.

The capacity of this surge killer may become insufficient depending on the output circuit to be used, causing a breakage or malfunction. Before using this product, check the surge voltage restriction level of the solenoid valve to be used, the withstand voltage and circuit configuration of the output device, and the return delay time so as to judge whether or not this product can be used.

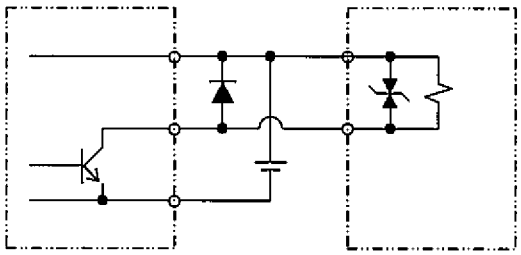
When necessary, take other surge prevention measures.

Note that the 4GA/B4-series solenoid valve with the surge killer suppresses the reverse voltage surge among terminals that occurs when the solenoid valve is turned OFF to the level stated in the table below.

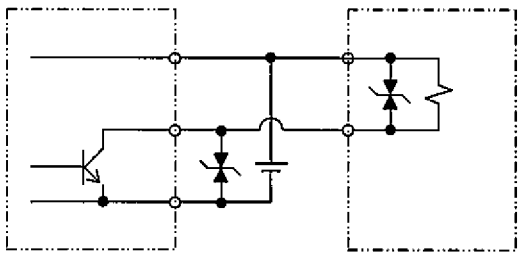
12VDC	Approx. 27V
24VDC	Approx. 47V

b) When the output unit is a NPN type, a surge voltage of "voltage stated in above table" + "power voltage" may be applied to the output transistor. To avoid this trouble, it may be required to separately install a contact protection circuit.

<Example 1 Separate installation of output transistor protection circuit>



<Example 2 Separate installation of output transistor protection circuit>



Periodic inspection (Section 6.1)

⚠ WARNING:	Before starting the maintenance work, always turn OFF the power completely and shut down the compressed air supply Make sure that any residual pressure does not exist. • The above conditions are absolutely required to maintain the safety.

⚠ CAUTION:	To correctly control the maintenance work, carry out the daily inspection and periodic inspection properly as scheduled. • If the maintenance work is not controlled properly, the functions of the product may lower significantly, causing a fault or an accident, such as short service life, breakage, or malfunction.

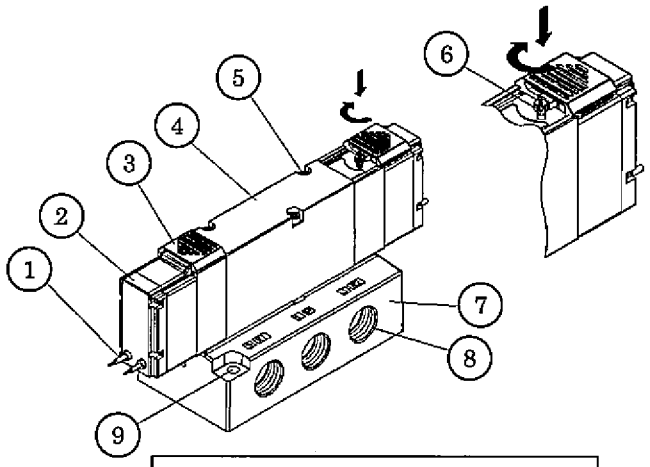
Disassembly and reassembly (Section 6.2)

⚠ WARNING:	Please avoid to disassemble and reassemble the inside of the solenoid valve. Failure to follow this instruction may cause the sealing performance or drip-proof performance to decline. ·Note that the solenoid valve, which has been disassembled and reassembled by the customer, becomes beyond the coverage of the product guarantee

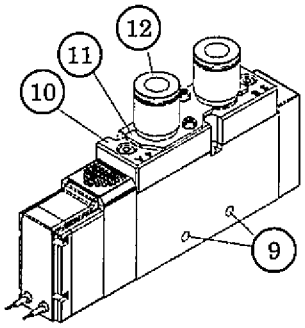
Discontinue

4GA4·4GB4
Instruction Manual No. SM-P00029

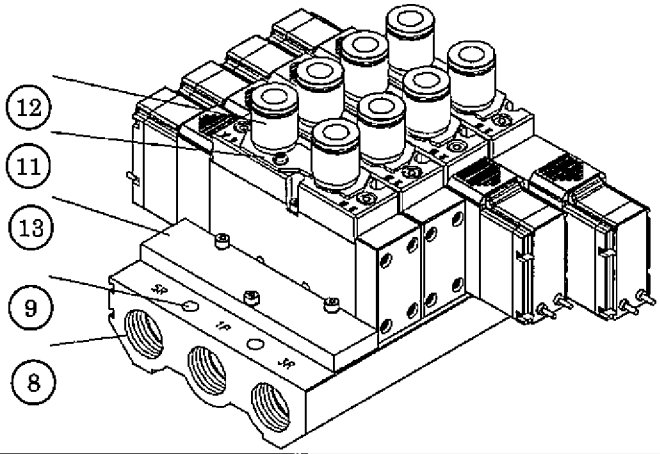
1. Product part names and functions



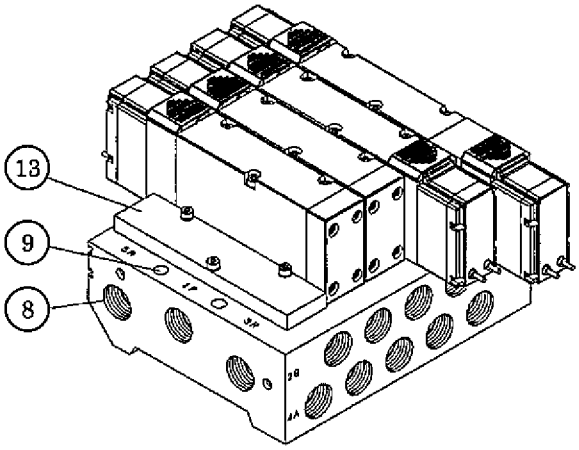
Individual base piping type



Individual direct piping type

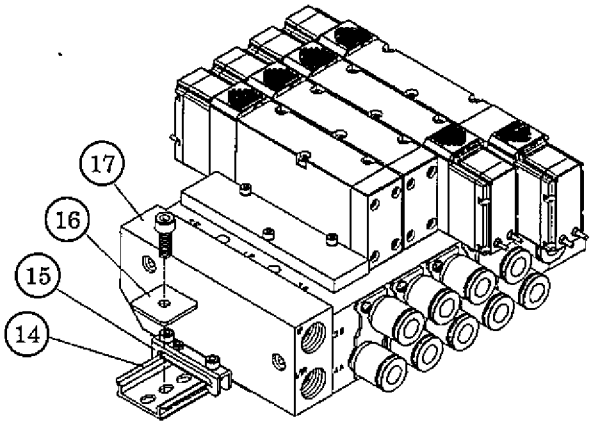


Individual wiring and direct piping type manifold



Individual wiring base piping type manifold

Discontinue



Individual wiring base piping type manifold
(DIN rail mount type)

No.	Name	Description
①	Lead wire	There are no polarities when energized.
②	Electric component cover	The green power supply indication lamp on the top is lit when the coil is energized. (E·EJ type only)
③	Manual protection cover	This protection cover is intended to prevent the manual operation device from malfunctioning. Operate the manual operation device with the cover opened during manual operation.
④	Individual valve	
⑤	Individual valve mounting screw	Three screws are provided for each individual valve so as to fix the individual valves to various bases.
⑥	Manual operation device	Commonly used for lock and non-lock type
⑦	Individual sub-base	This sub-base is assembled to use it in the base piping type individual specifications.
⑧	Piping port	"1(P)", "3(R2)/5(R1)", and "2(B)/4(A)" show the supply, exhaust, and output ports, respectively.
⑨	Mounting hole	This mounting hole is used for the direct mounting.
⑩	Joint adaptor	This joint adaptor is assembled for use in the direct piping type individual specifications.
⑪	Joint stopper plate	This stopper plate is intended to fix the cartridge joint.
⑫	Joint	Replaceable cartridge type push-in joint
⑬	Masking plate	When adding a valve, this plate is substituted for the individual valve.
⑭	DIN rail	Steel DIN rail is used.
⑮	Retainer	This retainer is used to fix the portion between the manifold base and DIN rail.
⑯	Square washer	This washer is used to fix the DIN rail.
⑰	Supply/exhaust block	This block is assembled when the supply/exhaust direction is the A/B port side and the DIN rail mount type is used.

2. Port indication and SI unit system

2. 1 Port indication

A piping port indication corresponding to the ISO and JIS standards, such as 1P or 4A is shown at the piping port position.

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

- The mounting posture of the solenoid valve is not limited. "4(A)", "2(B)/5(R1)", and "3(R2)" port for 4GA/B4-series are in reverse, respectively , compared to the 4K-series (CKD). Therefore, carefully check the port symbol and take appropriate measures so that the reverse action of the cylinder or other device does not occur.

2. 2 Conversion between SI unit and conventional unit

This instruction manual is described in SI units (International System of Units).
The following tables show the conversion between major SI units and conventional units.

SI unit conversion table (Boldface units show the SI units.)

Conversion example (in the case of pressure)

1kgf/cm² → 0.980665MPa 1MPa → 1.01972×10kgf/cm²

- 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/m²	MPa or N/mm²	kgf/mm²	kgf/cm²
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

Note: 1Pa=1N/m², 1MPa=1N/mm²

- Pressure

Pa	kPa	Mpa	bar	kgf/cm²	atm	mmH2O	mmHg又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

Note: $1Pa=1N/m^2$

3. Unpacking

⚠ CAUTION: Do not open the solenoid valve packaging bag until the piping work is started.

- If the packaging bag is opened before starting the piping connection work, foreign matter may enter the inside of the solenoid valve through the piping port, causing a trouble or malfunction.

(1) Make sure that the model No. indicated on the product you have received is the same as the product you have ordered.

(2) Make sure that the appearance of the product is not damaged.

(3) When the handling precaution sheet is supplied with the product, thoroughly read its contents together with this instruction manual before using the product.

4. Installation

WARNING : If the customer wants to use this product for special operation or application other than those described in the specifications, always contact CKD.

4. 1 Installation environment

CAUTION :

a) If a large amount of fine particle exists around the work place, should be checked the exhaust piping.

・Respiration may occur at the exhaust port of the solenoid valve caused by activation of the valve body to suck foreign matter around the exhaust port. If the exhaust port is faced upward, foreign matter may enter.

To prevent these troubles, mount the silencer or make the pipingofthe exhaust port faced downward.

b) Do not splash the water or cutting oil directly onto the product.

- If the water or cutting oil is directly splashed onto the solenoidvalve,this may cause electric leak or coil burnt-out.

Additionally, the DIN terminal box specifications have a degree of protection similar to IP65. However, this degree of protection does not guarantee the water-proof performance permanently.

- If the cutting oil is splashed onto the rod of the cylinder, the cutting oil enters the piping on the secondary side of the solenoid valve through the cylinder, causing a malfunction. Therefore, take appropriate measures to avoid splashing of the cutting oil. If this trouble can be foreseen, contact CKD separately.

c) The coil heats up when electrified.

- If this product is mounted inside the control panel or if it is powered ON for an extended period of time, consider appropriate heat radiation measures, such as ventilation. Failure to follow this caution may put the product in a high-temperature status.

d) This product cannot be operated in a corrosive or solvent environment.

- Do not use this product in the corrosive gas, such as sulfur dioxide or the solvent atmosphere.

e) Vibration resistance and Shock resistance

- Do not apply a vibration of 50m/s^2 or more or an impact of 300m/s^2 or more to the product.
- When mounting the product on the DIN rail, do not apply a vibration of 30m/s^2 or more or an impact of 150m/s^2 or more to the product.

f) In a high-humidity environment, dew condensation may occur as the temperature is changed. Therefore, do not operate this product in such environment.

g) This product cannot be used in an explosion environment.

At this time, always select an explosion-proof solenoid valve.

4. 2 Installation

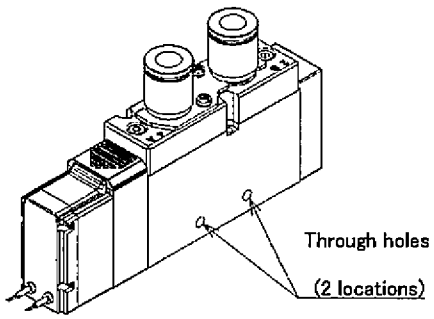
⚠ WARNING :	When mounting the solenoid valve, do not support it by the piping. ・ Mount the solenoid valve body and fix it firmly.

⚠ CAUTION :	When mounting this product on the DIN rail, check the strength ・ If the strength is insufficient, mount the manifold body directly.

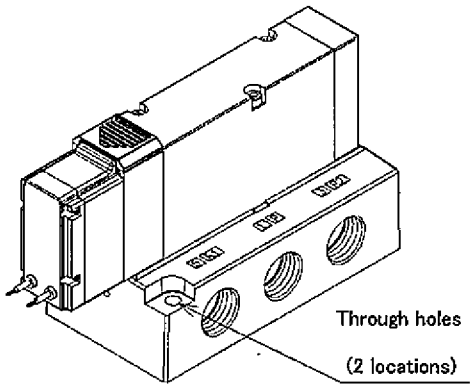
4. 2. 1Keep a sufficient space around the solenoid valve for mounting, removal, wiring, and piping work.

4. 2. 2Direct installation

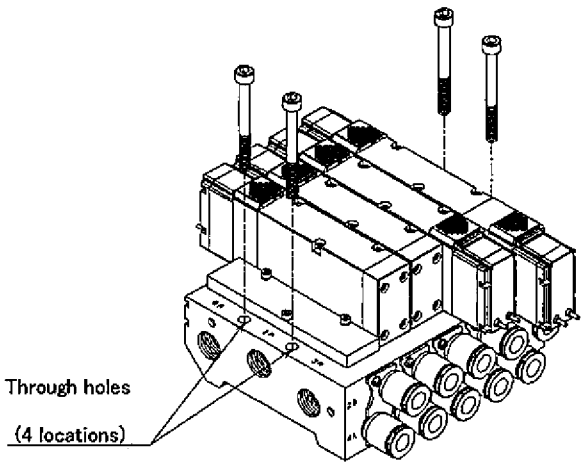
(1) 4GA4, through holes in side panel (2 locations)



(2) 4GB4, through holes (2 locations)

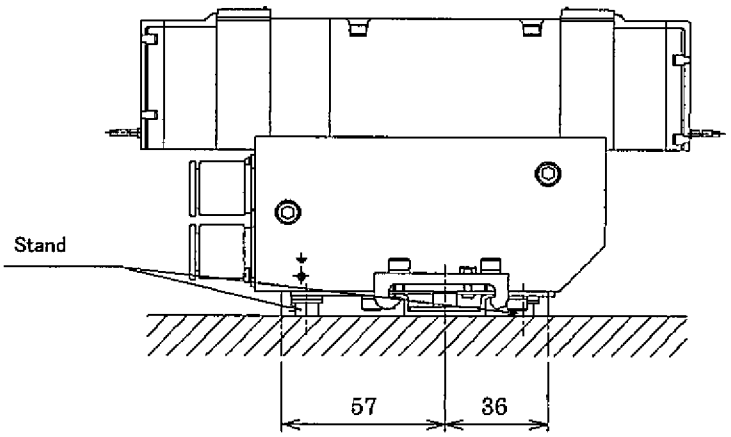


(3) M4GA/B4, through holes (4 locations)

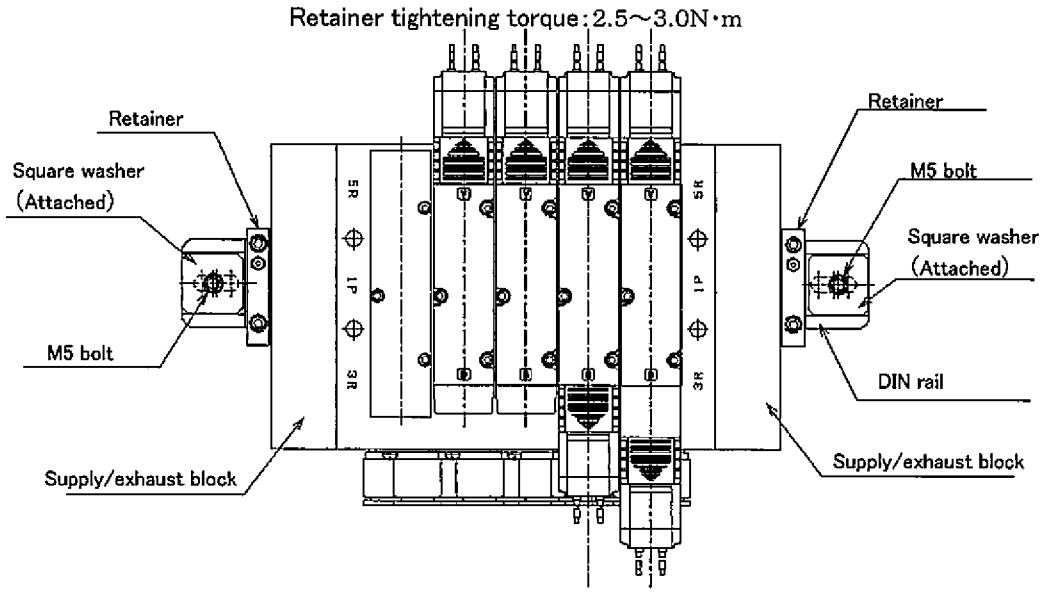


4. 2. 3 Installation with DIN rail

A stand is mounted on the supply/exhaust block at both ends of the DIN rail mount type to suppress the vibration and/or impact.
Keep a flat area (width 57 + 36 mm) shown in the Fig. below to seat the stand on the DIN raimounting surface.



Fix the DIN rail on the mounting surface at intervals of 75 to 100 mm using the square washers and M5 bolts supplied with the DIN rail. Before starting the operation, make sure that the installation status is correct.
Additionally, install the valve at a position where the retainer or supply/exhaust block does not interfere with the M5 bolt. Furthermore, steel DIN rails are used to maintain the strength.
When preparing separate DIN rails, always use steel DIN rails.



If not mounted correctly, this may cause the manifold to drop or be damaged. Carefully check this point. Additionally, up to five DIN rails can be mounted.

4. 3 Piping

CAUTION:

a) When connecting the piping, tighten it with a proper torque.

- This is intended to prevent the air leak or screw breakage. To prevent the screw thread from being scratched, first tighten the piping manually, and then tighten it firmly with tools.

b) Connect the piping firmly so that the coupling of the piping connection is not disconnected due to movement, vibration, or tension of the system.

- If the piping on the exhaust side of the pneumatic circuit is disengaged, the speed of the actuator cannot be controlled.
- In the case of chuck holding mechanism, the chuck is released, resulting in a dangerous status.

c) When supplying the compressed air after the piping connection has been completed, always check that no air leaks from all parts of the piping connection.

d) When supplying the compressed air after the piping connection has been completed, supply the air so that the high pressure is not applied rapidly.

- Otherwise the piping connection may be disconnected and the piping tube may jump up to cause a serious accident.

e) Do not throttle the exhaust port of the solenoid valve to the port diameter or less of the piping connection port.

- If the exhaust is not smooth, the actuator is not activated correctly. When using the manifold, this may hinder the correct operation of other solenoid valve.

f) Removal of foreign matter

- Foreign matter inside the piping, such as rust may cause operation fault or leak from the valve seat. Put a filter with a size of 5 μm or less at a position just before the solenoid valve.

g) Air supply

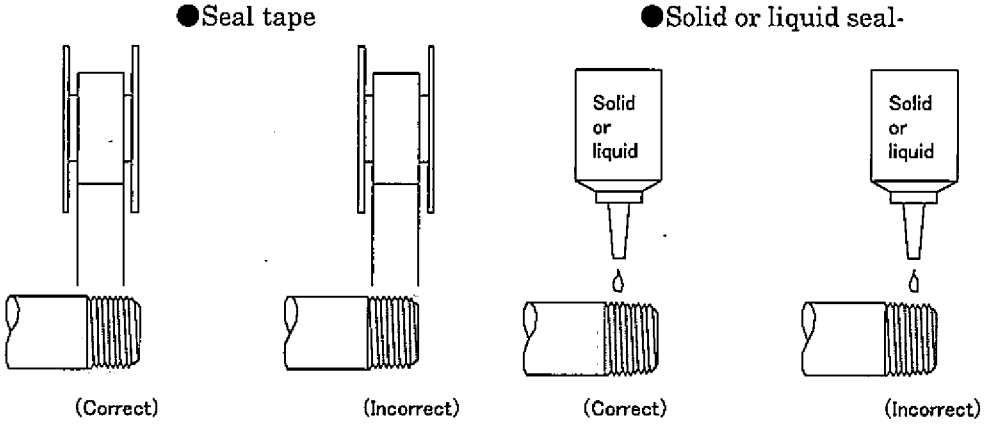
- Do not throttle the supply piping. When multiple valves are operated, the pressure drops, causing an operation delay fault.

Proper tightening torque

Connection screw	Tightening torque(N·m)
M3	0.3~0.6
M5	0.5~1.0
Rc1/8	3~5
Rc1/4	6~8
Rc3/8	13~15
Rc1/2	16~18

4. 3. 1 Sealant

When using the sealant, take great care so that any sealant does not enter the inside of the piping and that any sealant does not leak outside.



When winding the fluororesin seal tape on the screw part, wind the seal tape two or three times where one or two screw threads remain at the top end of the screw, and then push the tape by tip of the nail to make the tape tightly in contact with the screw. When using the liquid sealant, apply a proper amount of sealant where one or two screw threads remain at the top end of the screw.
At this time, do not apply the sealant to the female screw parts of the machine

4. 3. 2Flushing

Before starting the piping work, perform the flushing of the piping tube, solenoid valve, and related devices to remove foreign matter.

4. 3. 3Blow circuit

Do not open the cylinder port to the atmosphere. Doing so may lower the supply pressure, causing a malfunction. At this time, to avoid this trouble, use an external pilot type. The lower limit pressure of the internal pilot type is 0.2 MPa.

4. 3. 4Exhaust port

Do not throttle the exhaust air where possible. Doing so may cause response delay of the cylinder. If this occurs, adjust the speed between the cylinder and solenoid valve.

4. 3. 5 Piping connection

(1) Applicable tubes

For the solenoid valve with the push-in joint, use the tubes specified by CKD.

Soft Nylon (F-1500-series)
Urethane (U-9500-series)

(2) Use fire-resistant tubes or steel pipes in an atmosphere where spatter scatters.

(3) Use hydraulic hoses for the piping, which are common to the hydraulic and pneumatic use.

When using the standard push-in joint for the spiral tube, fix the root of the tube with hose bands. Otherwise, rotation occurs, causing the holding capability to lower.

In a high-temperature atmosphere, always use the fastening joint. It is not allowed to use the push-in joint in this atmosphere.

(4) When using generally available tubes, carefully check the accuracy of the outside dimension, wall thickness, and hardness.

Always use urethane tubes with a hardness of 93° or more (rubber hardness tester).

If a tube not satisfying the diameter accuracy and hardness, the chuck force lowers. As a result, the tube is removed easily or becomes hard to insert

Tube dimensions

Outside diameter mm	Inside diameter mm	
	Nylon	Urethane
φ6	φ4	φ4
φ8	φ5.7	φ5
φ10	φ7.2	φ6.5
φ12	φ8.9	φ8

Tolerance of outside diameter

Soft/hard Nylon	±0.1mm
Urethane φ6	+0.1mm -0.15mm
Urethane φ8, φ10, φ12	+0.1mm -0.2mm

(5) Bending radius of tube

The bending radius of the tube should be the minimum bending radius or more. Otherwise, disconnection or leak may result.

Tube diameter	Min. bending radius mm	
	Nylon	Urethane
φ6	20	20
φ8	30	30
φ10	40	40
φ12	55	50

(6) Cutting of tube

Using a tube cutter, cut the tube vertically to the axis direction. If a tube, which has been cut diagonally, is inserted, this may cause air leak.

(7) Tube connection status

Keep a straight part having a length equivalent to the outside diameter of the tube to be used from the top end part of the joint. Do not bend the piping at a acute angle at the joint insertion port. Pay special attention so that the horizontal tensile force of the tube does not exceed 40N

(8) Applicable blank plugs
For the solenoid valve with the push-in joint, use the blank plug specified by CKD.

Blank plug (GWP□-B-series)

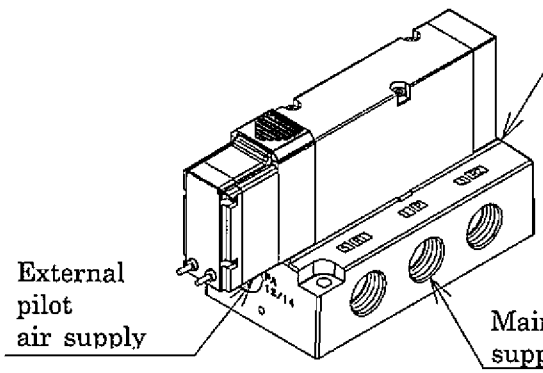
4. 3. 6External pilot (K) piping port

The external pilot (K) type has an individual pilot air supply. Take great care so make sure that the piping connection position is corrent. If the piping work is not performed correctly, this may cause a malfunction.

Port indication

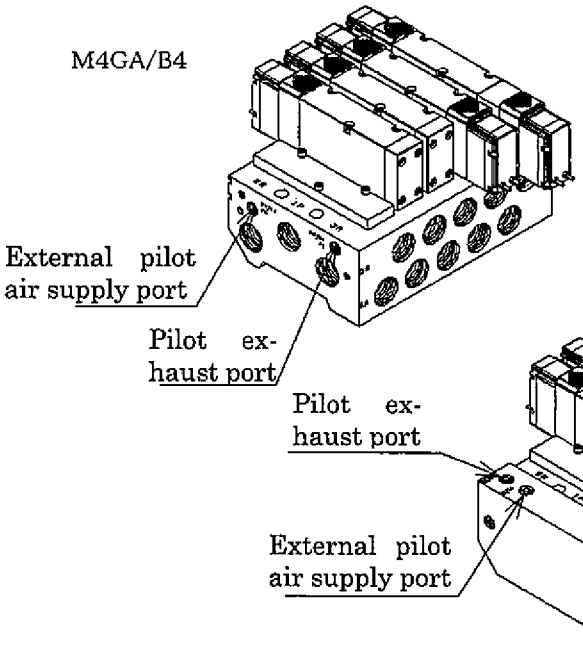
Application		Indication (ISO standard)
Pilot air	Air supply port	12/14
Pilot air	Exhaust port	82/84

・ Individual base



The external pilot air supply port position is located on the left when viewed from the main valve supply port.

Manifold



The external pilot air supply port position is located at the position far from the A/B port. Two ports are provided at both ends.

4.4 Wiring

⚠ WARNING:

Before starting the electric wiring work, thoroughly read the instruction manual to fully understand its contents.

After that, perform the disassembly and assembly work properly.

- Knowledge to maintain the safety base on understanding the structure of the solenoid valve and the operation principle is absolutely required.

⚠ CAUTION:

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

b) Do not apply stress to the lead wires.

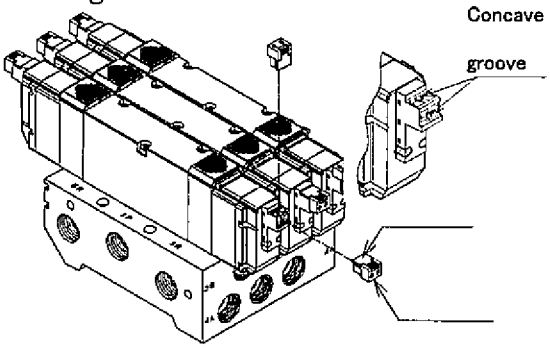
- Undue stress may cause such problems as a break in the wire or disconnection of the contact terminal.

4.4.1 How to use E type connector

This E type connector is a connector common to the upper and horizontal connections that allows the socket connection in either the upper or horizontal direction.

The socket assembly has been supplied with this product before shipment from the factory. Select a connection direction according to the installation status.

1) Attaching or detaching of socket

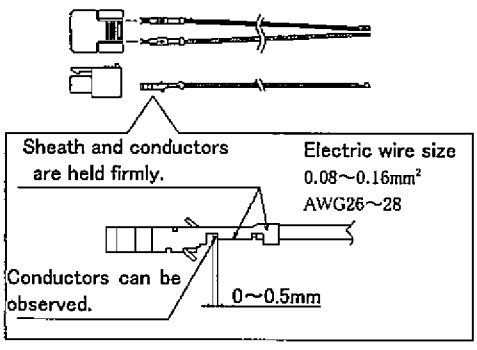


(1) When attaching the socket, hold the lever and socket body by fingers and insert them straight into the insertion port of the connector body.
Hang the claw of the lever on the concave groove on the connector body to lock it.
Carefully check the socket posture so that the lever is located at the front when mounting the socket in the upper direction and that the lever is located at the upper position when mounting the socket in the horizontal direction.

(2) To pull out the socket, push down the lever to disengage the claw from the concave groove, and then pull it out straight.

2) Wiring of lead wires

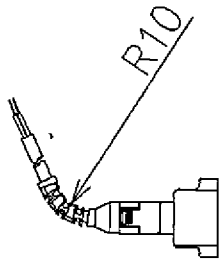
(1) Strip the sheath approx. 3 mm from the top end of the lead wire and align the top ends of the conductors
and insert them into the contact terminal.
Crimp the contact terminal with the crimp tool.
When crimping, pay special attention so that the sheath and conductors are held firmly,
and 0 to 0.5 mm of conductor top can be observed.

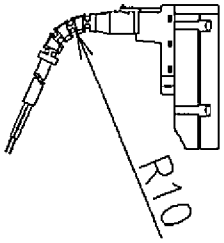


(2) After the crimp work has been completed, face the contact terminal in the direction as shown in the Fig. on the right and insert it into the insertion port of the socket until it is in contact with the far position.
The lock is then activated inside the socket.
After the work has been completed, lightly pull the terminal to check that the lock is activated.

4.4.2 How to use E□J type connector

The following Fig. shows the limitation on dimensions when bending the lead wire.





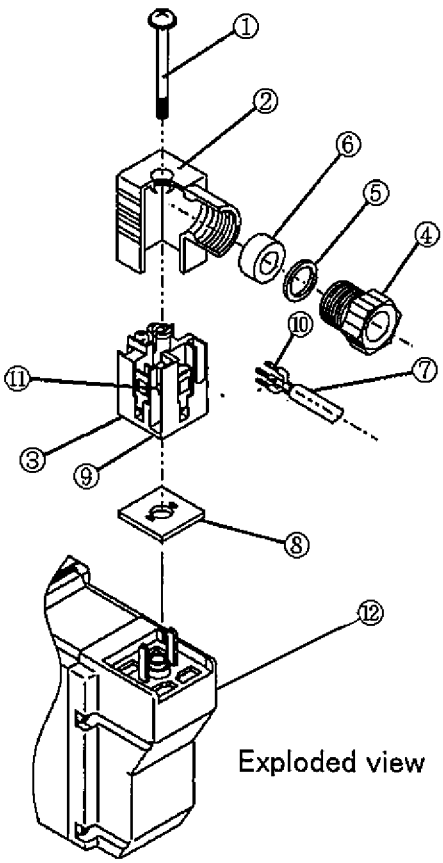
4.4.3 How to use DIN terminal box

1) Disassembly

(1) Loosen the screw ① and pull the cover ② in the direction of the screw①.
The connector is then disconnected from the coil assembly ⑫.

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

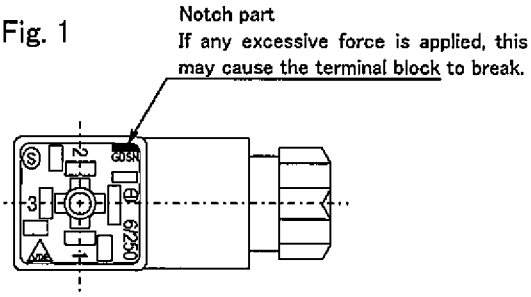
(3) The notch part ⑨ (next to the GDSN mark) exists on the bottom of the terminal block ③
Insert a small slotted screwdriver into the clearance between the cover②
and terminal block ③, and then pry it.
The terminal block ③ is then removed from the cover ②. (See also Fig. 1.)
Remove the terminal block so that an excessive force is not applied.
If an excessive force is applied, this may cause the terminal block to break.



Exploded view

(4) Remove the cable gland ④, and then take out the washer ⑤ and rubber packing ⑥.

Fig. 1



2) Connection

(1) Preparations for connection

- The applicable outside diameter of the cable ⑦ is VCTF2 (3) conductor (ϕ 3.5 to 7) specified in JISC3306.
- The lead wire sheath stripping length of the cable is 10 mm.
- Either stranded wire or single wire can be connected.
- When using the stranded wire, do not connect the solder finished stranded wire.
- When using the crimp sleeve ⑩ for the top end of the stranded wire, select H0.5/6 (0.3 to 0.5mm^2) or H0.75/6 (0.75mm^2) manufactured by Widemüller Japan Co. Ltd. or its equivalent.
  Note that the crimp sleeve must be prepared by the customer.

(2) Connection

- Pass the cable gland ④, washer ⑤, and rubber packing ⑥ through the cable ⑦ in that order and insert the cable into the cover ②.
- Connect the cable to the terminals 1 and 2. The cable has no polarities.
- The recommended tightening torque is 0.2 to 0.25N·m.

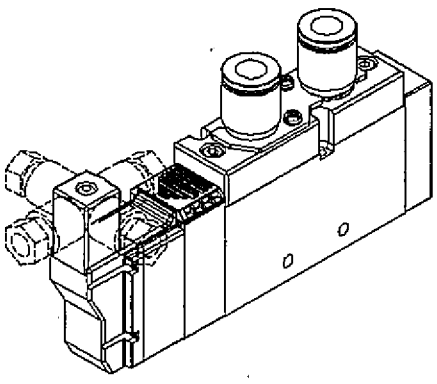
3) Assembly

(1) Set the connected terminal block ③ on the cover ②.
(Push the terminal block until a click sounds.)
※ The terminal block can be set in four directions. (Fig. 2)

(2) Put the rubber packing ⑥ and washer ⑤ in the cable lead-in port of the cover ② in that order. Additionally, tighten the cable gland ④ firmly.
Remarks: The reference tightening torque of the cable gland is 1.0 to 1.5N·m.
Pull the cable to check that it is not pulled out.

(3) Put the gasket ⑧ in the clearance between the bottom of the terminal block ③ and the plug of the coil assembly ⑫. Connect the connector and insert the screw ① into the cover ② from the upper portion. After that, tighten the screw firmly.
Remarks: The recommended tightening torque of the screw is 0.2 to 0.25N·m.

Fig. 2

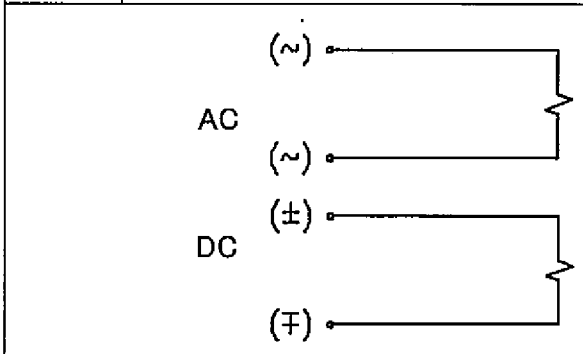


4.4.4 Electric connection circuit diagram

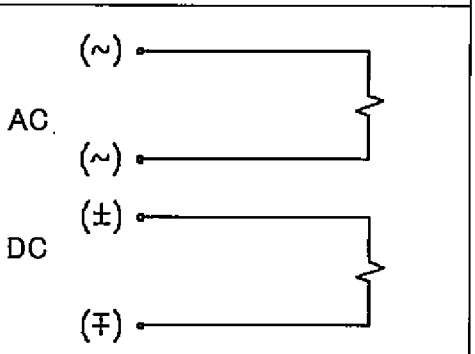
Electric wire connection (Wiring method)

Ⓝ : Without lead wire
Ⓦ : With lead wire
Ⓚ : With surge killer
Ⓛ : With lamp
Ⓢ : Without socket

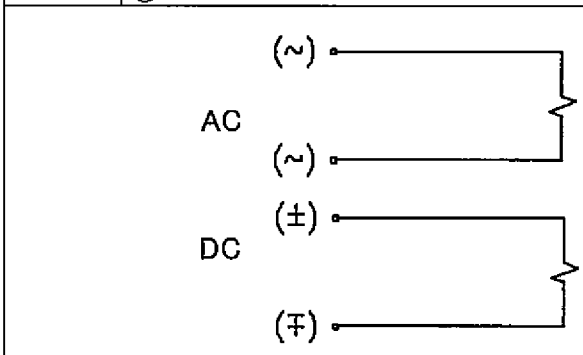
No symbol	Grommet lead wire Ⓦ



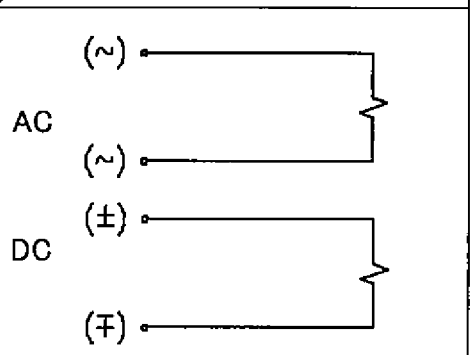
E0 E0※J	E type connector･EJ type connector Ⓦ



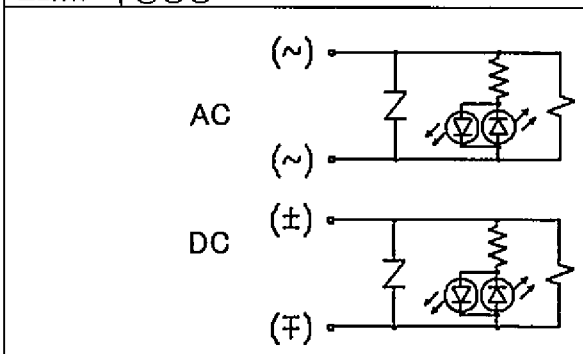
E0N	E type connector Ⓢ



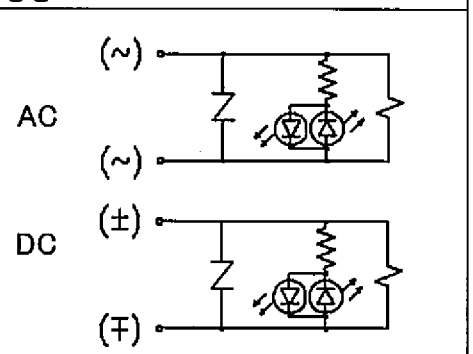
E1	E type connector Ⓝ



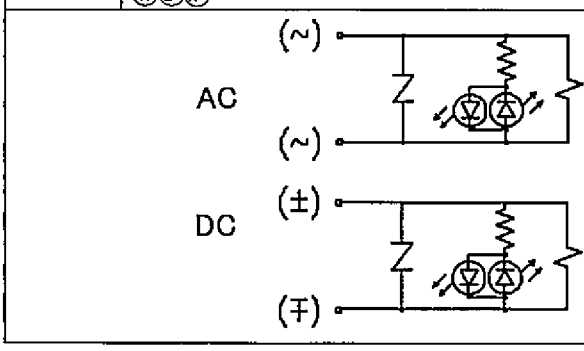
E2 E2※J	E type connector･EJ type connector ⓌⓁⓀ



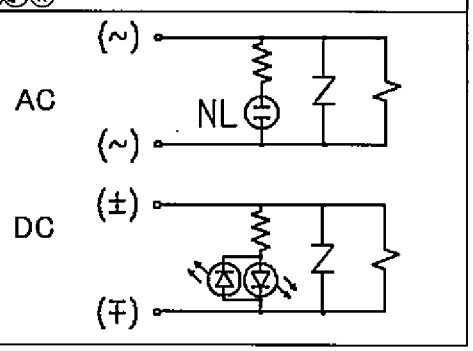
E2N	E type connector ⓁⓀⓈ



E3	E type connector ⓃⓁⓀ



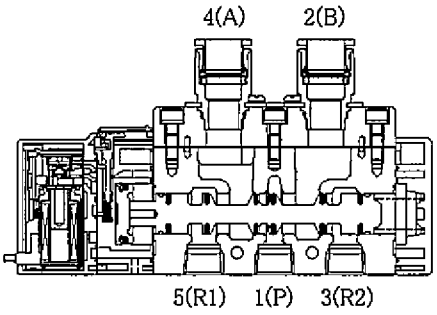
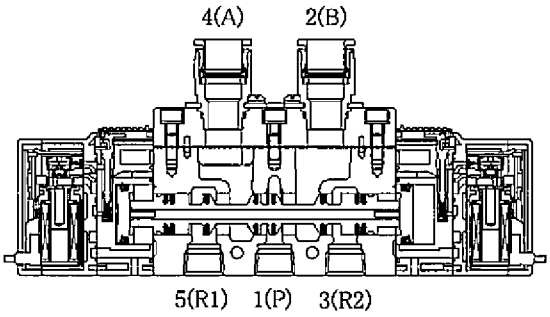
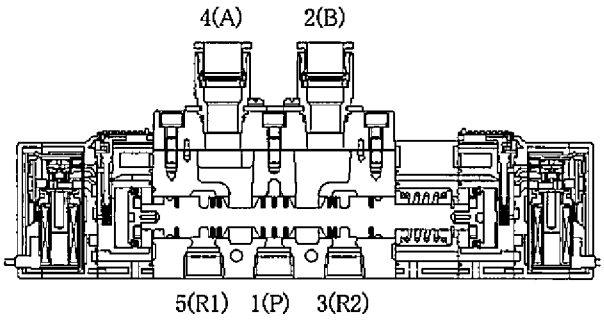
B	DIN terminal box ⓌⓁⓀ



5. Proper operation

5.1 Description of operation

1) Valve operation

	Operation diagram	Description of operation
4G※410 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※420 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※430 4G※440 4G※450 3-position		De-energized. (As shown in the diagram.) 1(P),4(A),2(B),5(R1),3(R2) closed ※1 De-energized 1(P) is closed. 4(A),2(B)→5(R1),3(R2) ※1 De-energized. 1(P)→4(A),2(B) 5(R1) and 3(R2) are closed. ※1

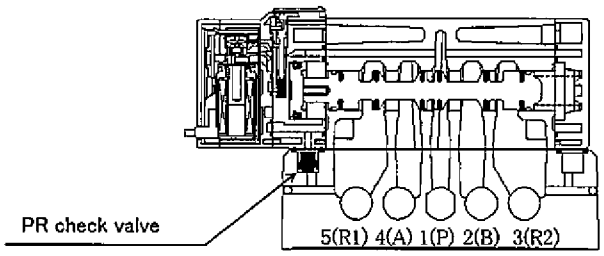
※1 For details about energized operation of each solenoid, see 4G*420.

2) Manifold operation

For the standard or internal pilot specifications, the main exhaust (R) and pilot exhaust (PR) are centralized in the manifold body to exhaust them through the exhaust port. For the external pilot specifications, the main exhaust (R) and pilot exhaust (PR) are exhausted individually.

3) Malfunction preventive measures

A PR check valve is mounted in the base PR passage of the 4GB4 individual valve and M4GA/B4 manifold to prevent the solenoid valve from malfunctioning caused by the pilot back pressure.



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.
Make sure that the lock is released (OFF status).
In the 4GA/B4-series, when the manual cover is closed, this shows the status that the lock is released.

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

(1) This 4G4-series is a pilot solenoid valve. If the air is not supplied to the P port, the main valve is not switched even though the manual device is operated.

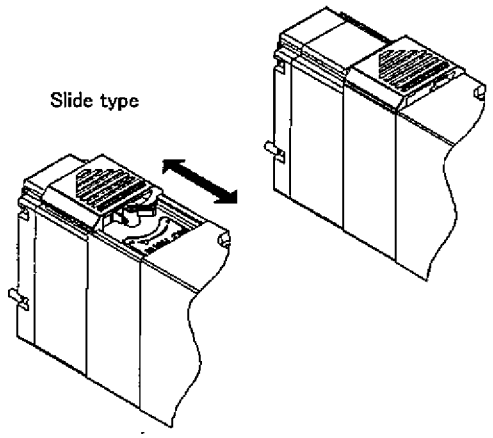
(2) The manual protection cover is provided as standard unit.
Since the product has been shipped with the manual protection cover closed, the manual device is protected and it cannot be seen when the product is de livered. After the product has been delivered, open the protection cover and manually operate 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) This manual device is commonly used for the non-lock and lock types.
To lock, push the device and turn. To lock the manual device, always push t he device, and then turn it.
If the manual device is turned without pushing, this may cause the manual device to break or the air to leak.

[SM-P00029-A/3]

5.2.1 Opening or closing of manual 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.)

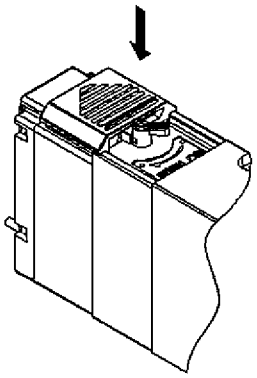


5.2.2 Operation of manual device

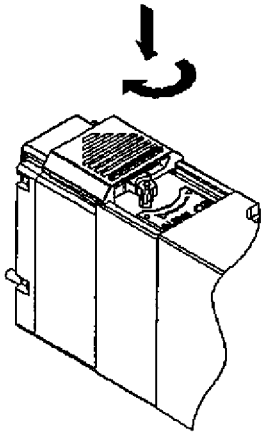
1) Push and non-lock operation

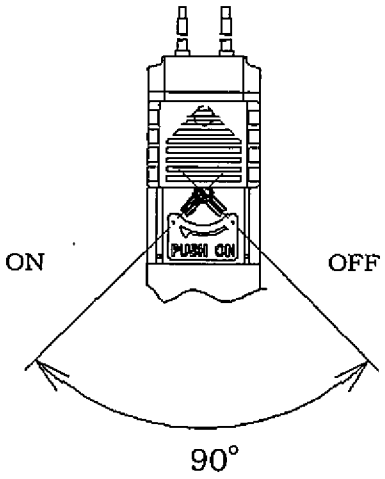
Push the manual device in the direction indicated by an arrow until it is stopped.

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 oilless valve is lubricated, the oilless function cannot be maintained.
   When lubricating the oilless 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).

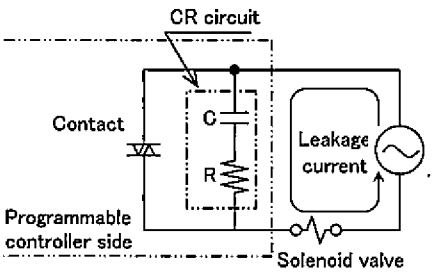
5.4 Electric circuit

5.4.1 About 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.



100VAC	3.0 mA or less
12VDC	1.5 mA or less
24VDC	1.8 mA or less

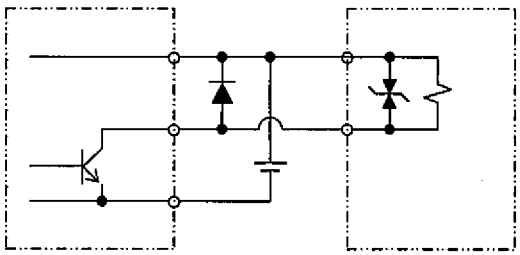
CAUTION:

a) The surge killer functions to restrict a solenoid valve surge voltage of several hundred V to a low voltage level, at which the output contact can withstand.
The capacity of this surge killer may become insufficient depending on the output circuit to be used, causing a breakage or malfunction. Before using this product, check the surge voltage restriction level of the solenoid valve to be used, the withstand voltage and circuit configuration of the output device, and the return delay time so as to judge whether or not this product can be used.

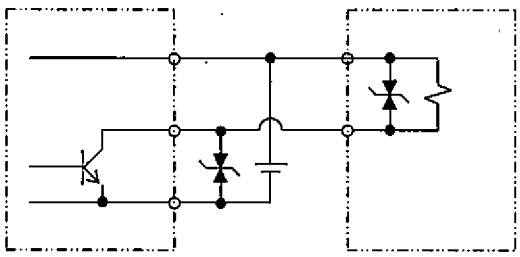
12VDC	Approx. 27V
24VDC	Approx. 47V

b) When the output unit is a NPN type, a surge voltage of "voltage stated in above table" + "power voltage" may be applied to the output transistor. To avoid this trouble, it may be required to separately install a contact protection circuit.

<Example 1 Separate installation of output transistor protection circuit>



<Example 2 Separate installation of output transistor protection circuit>



(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.

6.Maintenance

6.1 Periodic inspection

> **WARNING:** Before starting the maintenance work, always turn OFF the power completely and shut down the compressed air supply to make sure that any residual pressure does not exist.
>
> - The above conditions are absolutely required to maintain the safety.

> **CAUTION:** To correctly control the maintenance work, carry out the daily inspection and periodic inspection properly as scheduled.
>
> - If the maintenance work is not controlled properly, the functions of the product may lower significantly, causing a fault or an accident, such as short service life, breakage, or malfunction.

1) To operate the solenoid valve at its optimal operating level, carry out the periodic inspection once or twice a year.

2) For the inspection contents, it is recommended to check whether or not the screw is loose and to confirm the sealing ability of the piping connections.
Discharge the drain from the air filter periodically.

(1) Pressure control of supply compressed air
Is the supplied pressure at the setted valve?
Does the pressure gauge in operation of the device show the set pressure?

(2) Control of pneumatic filter
Is the drain discharged correctly?
Is the contamination status of the bowl or element correct?

(3) Control of compressed air leak of piping connection
Is the status of the connection of the movable part particularly correct?

(4) Control of solenoid valve operation status
Are there any activation delay ? Is the exhaust status correct?

(5) Control of pneumatic actuator operation status
Is the operation smooth?
Is the stop status at the end correct?
Is the connection with the load correct?

(6) Control of lubricator
Is the oil amount adjusted correctly?

(7) Control of lubricant
Is the specified lubricant supplied?

6.2 Assembly and reassembly

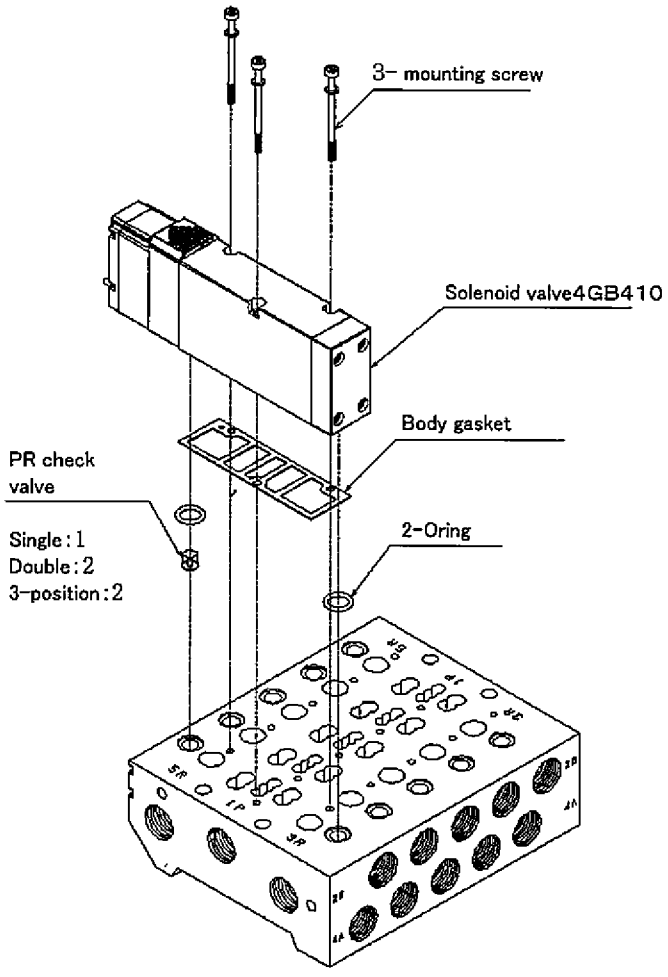
WARNING: The customer never attempts to disassemble and reassemble the inside of the solenoid valve. Failure to follow this instruction may cause the sealing performance or drip-proof performance to lessen

·Note that the solenoid valve, which has been disassembled and reassembled by the customer, becomes beyond the coverage of the product guarantee.

6.2.1 Replacement of solenoid valve

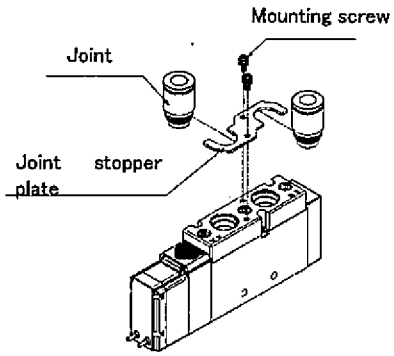
When replacing the solenoid valve, pay special attention so that the gasket ,O-ring, quick valve is not fallen down.

Screw size	Proper tightening torque (N·m)
M3	1.6~1.8



6.2.2 Replacement of cartridge joint

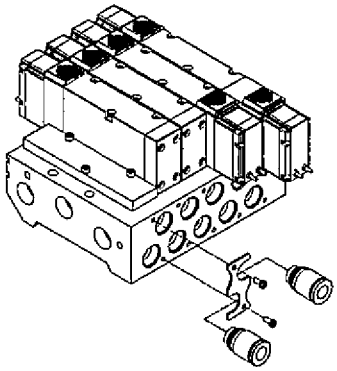
Before changing the push-in joint size, check the proper work steps.
If the cartridge joint is not mounted correctly or if the mounting screw is tightened insufficiently, this may cause air leak.
Therefore, take great care for these points.



1) Direct piping (A) type

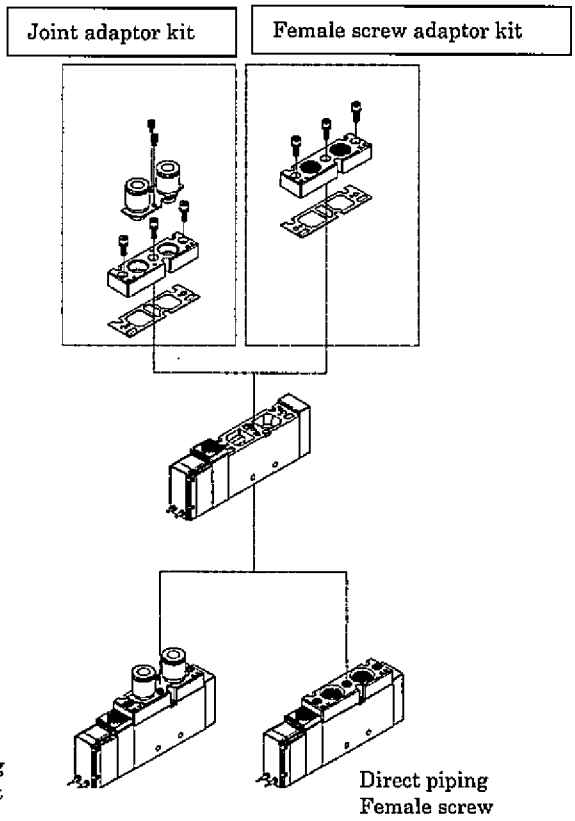
①Remove the mounting screws.
②Pull out the stopper plate and joint at the same time.
③Adjust the groove on the joint for replacement to the stopper plate, and assemble them temporarily.
④Mount the stopper plate and joint at the same time,
and then tighten the mounting screws firmly.
Pull the joint to check the mounting status.

Part name	Size	Tightening torque (N·m)
Stopper plate	M3	0. 6~0. 8



2) Base piping (B) type

①Remove the mounting screws.
②Pull out the stopper plate and joint at the same time.
③Adjust the groove on the joint for replacement to the stopper plate, and assemble them temporarily.
④Mount the stopper plate and joint at the same time,
and then tighten the mounting screws firmly.
Pull the joint to check the mounting status.



6.2.3 Method for changing of piping connection specifications

If the mounting screw is tightened insufficiently when the joint adaptor mounted on the body is replaced, and the push-in joint specifications and lock screw specifications are changed, this may cause air leak.
To prevent this trouble, carefully check the tightening torque.

Part name	Size	Tightening torque (N·m)
Joint adaptor	M4	2. 5~2. 7

7.Trouble shooting

Trouble shooting

Trouble symptom	Probable cause	Corrective action
Product does not function.	Electric signal is not received.	Turn ON the power.
	Electric signal is malfanction	Correct the control circuit.
	Fluctuation range of the voltage or current is large.	Review the power capacity. (Voltage fluctuation range ±10%)
Product malfunctions.	Excessive leakage current	Correct the control circuit or install the bleed circuit.
	Chattering occurs.	Review the switch part or loose wiring.
	Voltage is different from that stated on the nameplate.	Correct the voltage to that stated on the nameplate.
	Pressure source is shut down.	Operate the pressure source.
	Pressure is insufficient.	Readjust the pressure reducing valve or install the booster valve.
	Flow rate is insufficient.	Readjust the piping or install the tank for the surge.
	Pressure is applied from the exhaust side.	Review the piping.
	Piping is incorrect or piping is not performed.	Review the piping.
	Throttle valve of the speed controller is closed fully.	Readjust the.
	Product is used with the A or B port opened to the atmosphere.	Use the joint piping having a size similar or smaller to the joint size of P-port.
	Valve is frozen.	Take freezing preventive actions (heat insulation and removal of water content, etc.).
	Plunger return is delayed. (Excessive oil or tar)	Review the lubrication. (Turbine oil grade 1, ISO VG32) Readjust the drop amount of the lubricator. Install the tar removal filter.
	Exhaust part is clogged with particle dust.	Install the cover or silencer, and clean the valve periodically.
Working pressure is high.	Packing is swelling.	Review the lubrication. (Turbine oil grade 1, ISO VG32) Separate the valve from the place where the cutting oil is used. Do not put organic solvent around the work place.
	A/B port is opened to the atmosphere.	Review the piping.
	Foreign matter is caught in the packing.	Replace the valve.

8. Product specifications and how to code model numbers

8.1 Product specifications

1) Common specifications

Model No. / Item		4GA4/4GB4
Working fluid		Compressed air
Actuation		Pilot method
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 allowed.)
Fluid temperature ℃		5～55
Manual device		Comom-type non-lock and lock
Pilot exhaust method	Internal pilot	Main valve and pilot valve centralized exhaust type
	External pilot	Main valve and pilot valve individual exhaust type
Lubrication Note 1		Not required
Degree of protection Note 2		Dust-proof structure
Vibration resistance m/s^2 Note 3		50 or less
Shock resistance m/s^2 Note 4		300 or less
Atmosphere		It is not allowed to use this product in corrosive gas atmosphere.

Note 1: To lubricate the product, use the turbine oil grade 1 ISO-VG32.
Excessive lubrication or intermittent lubrication may cause unstable operation.

Note 2: Operate this product so that water droplet or oil is not splashed.
For the DIN terminal box specifications, IP65 (jet-proof type) or its equivalent may apply.
At this time, however, the fixing with specified cable outside diameter and tightening torque are preconditioned.
For details, see also section 4.4.3, How to use DIN terminal box (on page 20).

Note 3: Operate the DIN rail mount type with a vibration of $30m/s^2$ or less.

Note 4: Operate the DIN rail mount type with a impact of $150m/s^2$ or less.

Reference The unit of the pressure is MPa. The conversion is "1 MPa = 10.1972 kgf/cm^2".

2) Electric specifications

Model No. / Item		4GA4/4GB4
Rated voltage V	DC	12、24
	AC	100、110(50/60 Hz)
Variation range of rated voltage		±10%
Holding current A	DC12V	0.079(0.083)
	DC24V	0.040(0.042)
	AC100V	0.028 / 0.022
	AC110V	0.025 / 0.020
Power consumption W	DC12V	0.95(1.0)
	DC24V	0.95(1.0)
Apparent power VA	AC100V	1.8 / 1.4
	AC110V	(1.8 / 1.5)
Thermal class		B
Surge absorber		Option
Indicator		indicator light (option)

Note 4: The values in ( ) include the light.

Discontinue

3) Specifications by model

(1) Port size

Model No. / Item		4GA4	4GB4	M4GA4
Connection port diameter	A·B port	Push-in joint φ8, φ10, φ12 Rc3/8、G3/8、NPT3/8	Rc3/8·1/2、G3/8·1/2、 NPT3/8·1/2	Push-in joint φ8, φ10, φ12 Rc3/8、G3/8、NPT3/8
	P・R1・R2 port	Rc1/4、G1/4、NPT1/4	Rc3/8·1/2、G3/8·1/2、 NPT3/8·1/2	Rc1/2、G1/2、NPT1/2
	External pilot port		Rc1/8、G1/8、NPT1/8	

Model No		M4GB4			
Item		Direct mount			DIN rail mount Note 1
Pilot method		Standard (Internal pilot)		(External pilot)	Standard (Internal pilot)
Port size	A·B port	Push-in joint φ8, φ10, φ12 Rc1/4·3/8 G1/4·3/8 NPT1/4·3/8	Rc1/2、G1/2、NPT1/2	Push-in joint φ8, φ10, φ12 Rc1/4·3/8·1/2 G1/4·3/8·1/2 NPT1/4·3/8·1/2	Push-in joint φ8, φ10, φ12 Rc1/4·3/8 G1/4·3/8 NPT1/4·3/8
	P・R1・R2 port Note 2	Rc3/8,G3/8,NPT3/8	Rc1/2、G1/2、NPT1/2		Rc3/8,G3/8,NPT3/8
	External pilot port			Rc1/8、G1/8、NPT1/8	

Note 1: For the DIN rail mount type, select a model while carefully checking section 4.2.3, Installation on DIN rail, (on page 16).

Note 2: The outside dimensions will differ for connection diameters (P·R1·R2 ports) Rc3/8 compared to Rc1/2. See also the catalog for further information.

(2) Response time

Model No.			4GA4		4GB4	
Item			Turned ON.	Turned OFF.	Turned ON.	Turned OFF.
Response time ms	2-position	Single	40(40)	40(52)	40(40)	40(52)
		Double	40(52)	40(52)	40(52)	40(52)
	3-position	ABR connection	60(72)	60(72)	60(72)	60(72)

The above values show data obtained from the product with the lamp and surge killer.

The above response time shows data obtained when the supply pressure is 0.5 MPa, the temperature is 20℃, and the lubrication is not performed.

This value may vary depending on the pressure and oil quality.

Values in ( ) show data obtained when using the AC.

(3) Flow rate characteristics

Model No.	Change-over position class		P→A/B		A/B→R1/R2	
			C dm³/(S·bar)	b	C dm³/(S·bar)	b
4GA4	2-position		8.1	0.40	8.0	0.31
	3-position	All port block	6.9	0.37	7.5	0.42
		ABR connection	6.8	0.40	8.7	0.37
		PAB connection	8.9	0.37	7.6	0.27
4GB4	2-position		11	0.19	13	0.19
	3-position	All port block	9.1	0.11	12	0.27
		ABR connection	9.2	0.11	15	0.22
		PAB connection	10	0.06	12	0.24
M4GA4	2-position		7.3	0.12	9.0	0.17
	3-position	All port block	6.4	0.15	8.2	0.22
		ABR connection	6.4	0.16	9.3	0.19
		PAB connection	8.0	0.08	8.3	0.22
M4GB4 Rc3/8	2-position		6.4	0.42	6.9	0.12
	3-position	All port block	6.0	0.37	6.8	0.12
		ABR connection	6.1	0.38	7.1	0.15
		PAB connection	6.0	0.37	6.8	0.13
M4GB4 Rc1/2	2-position		8.3	0.23	9.0	0.21
	3-position	All port block	7.4	0.15	8.8	0.19
		ABR connection	7.5	0.15	9.5	0.21
		PAB connection	7.7	0.21	8.7	0.18

For M4GB4, the out side dimensions will differ for Port sizes (P·R1·R2 port) Rc3/8 compared to Rc1/2.

Note 1: The conversion of the effective cross-sectional area (S) and sonic conductance (C) is "S≒5.0×C".

Discontinue

(4) Mass

(1) Mass of individual valve

〔g〕

Model No				4GA4 Note 1	4GB4 Note 2
Mass	2-position	Single	Grommet lead wire	310(319)	563(256)
			E type connector	313(322)	566(259)
			DIN terminal box	322(331)	575(268)
		Double	Grommet lead wire	371(380)	620(313)
			E type connector	377(386)	626(319)
			DIN terminal box	395(404)	644(337)
	3-position	All port block	Grommet lead wire	402(411)	655(348)
			E type connector	408(417)	661(354)
			DIN terminal box	426(435)	679(372)

The mass of the E type connector shows the value including the socket assembly (with 300mm-lead wire).

For the mass of the EJ connector, "16g/pc." is added to the mass of the E type connector.

Note 1: For the 4GA4, the value in ( ) is the mass of the product, to which the mounting screw and gasket are attached.

Note 2: For the 4GB4, the value in ( ) is the mass of the product without the piping adaptor.

(2) Mass of manifold base

	M4GA4		M4GB4			
	Direct mount		Direct mount			DIN rail mount
Pilot method	Internal pilot	External pilot	Internal pilot		External pilot	Internal pilot
Max. number of links	15 links	12 links	15 links	12 links		5 links
Connection port diameter P·R1·R2 ports	Rc,G,NPT 1/2		Rc,G,NPT 3/8	Rc,G,NPT 1/2		Rc,G,NPT 3/8
Mass calculation formula [g] (n: Number of links)	150n+199	379n+617	273n+329	391n+560	392n+555	278n+1082

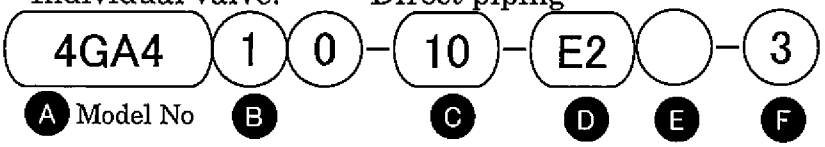
The mass of the manifold base shows the value of the product with the screw specifications.

If the number of manifold links is 5 or more, the supply and exhaust must be performed from the ports on both sides.

Discontinue

8.2 How to code model numbers

1) Individual valve: Direct piping



B Solenoid position		C Port size	
1	2-position single solenoid	C8	φ8 push-in joint
2	2-position double solenoid	C10	φ10 push-in joint
3	3-position all ports closed	C12	φ12 push-in joint
4	3-position A/B/R connection	10	Rc3/8
5	3-position P/A/B connection	10G	G3/8
		10N	NPT3/8

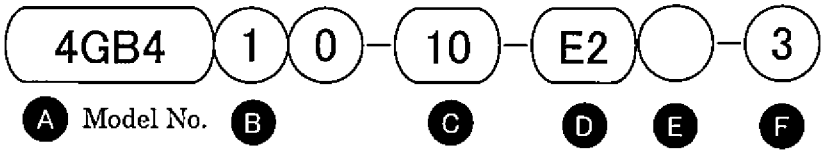
D Electric connection	
Blank	Grommet lead wire
B	DIN terminal box (Pg7), surge absorber and lamp provided.
E-connector (upward/lateral common)	
E0	Lead wire (300mm)
E00	Lead wire (500mm)
E01	Lead wire (1000mm)
E02	Lead wire (2000mm)
E03	Lead wire (3000mm)
E2	Lead wire (300mm), surge absorber and lamp 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	No lead wire (no socket)
E2N	No lead wire (no socket), surge absorber and lamp provided.
E3	No lead wire (socket and terminal provided), surge absorber and lamp provided.
E1	No lead wire (socket and terminal provided)
EJ-connector (socket with cover, upward/lateral common)	
E01J	Lead wire (1000mm)
E02J	Lead wire (2000mm)
E03J	Lead wire (3000mm)
E21J	Lead wire (1000 mm), surge absorber and lamp provided.
E22J	Lead wire (2000 mm), surge absorber and lamp provided.
E23J	Lead wire (3000 mm), surge absorber and lamp provided.

E Option	
Blank	None
A	Cutting oil applicable product
F	Built-in A·B port filter

F Rated voltage	
1	AC100V
3	DC24V
4	DC12V
5	AC110V

See also the catalog for further information.

2) Individual valve: Base piping



B. Solenoid position	
1	2-position single solenoid
2	2-position double solenoid
3	3-position all ports closed
4	3-position A/B/R connection
5	3-position P/A/B connection

C Port size	
10	Rc3/8
15	Rc1/2
10G	G3/8
15G	G1/2
10N	NPT3/8
15N	NPT1/2

D Electric connection	
Blank	Grommet lead wire
B	DIN terminal box (Pg7), surge absorber and lamp provided.
E-connector (upward/lateral common)	
E0	Lead wire (300mm)
E00	Lead wire (500mm)
E01	Lead wire 1000mm)
E02	Lead wire (2000mm)
E03	Lead wire (3000mm)
E2	Lead wire (300 mm), surge absorber and lamp provided
E20	Lead wire (500 mm), surge absorber and lamp provided
E21	Lead wire (1000 mm), surge absorber and lamp provided.
E22	Lead wire (2000 mm), surge absorber and lamp provided.
E23	Lead wire (3000 mm), surge absorber and lamp provided.
E0N	No lead wire (no socket)
E2N	No lead wire (no socket), surge absorber and lamp provided.
E3	No lead wire (socket and terminal provided), surge absorber and lamp provided.
E1	No lead wire (socket and terminal provided)
EJ-connector (socket with cover, upward/lateral common)	
E01J	Lead wire (1000mm)
E02J	Lead wire (2000mm)
E03J	Lead wire (3000mm)
E21J	Lead wire (1000 mm), surge absorber and lamp provided.
E22J	Lead wire (2000 mm), surge absorber and lamp provided.
E23J	Lead wire (3000 mm), surge absorber and lamp provided.

E Option	
Blank	None
K	External pilot
A	Cutting oil applicable product
F	Built-in A·B port filter

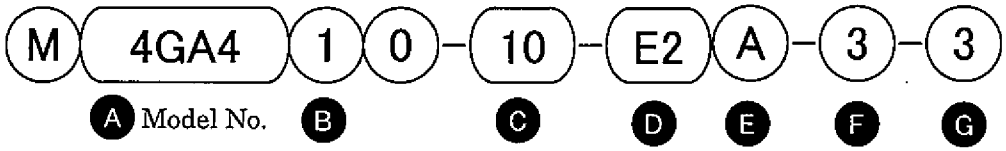
F Rated voltage	
1	AC100V
3	DC24V
4	DC12V
5	AC110V

See also the catalog for further information.

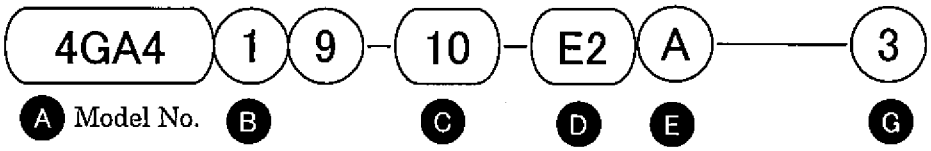
Discontinue

3) Individual wiring manifold: Direct piping

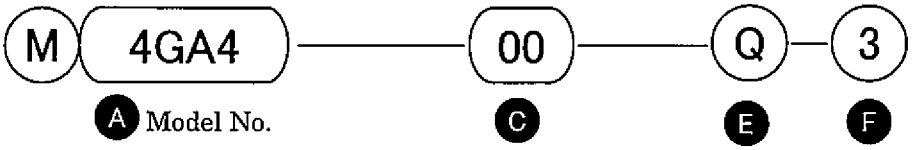
Manifold No.



Individual valve for base



Manifold base assembly



B Solenoid position		C Port size		E Option		F Station number		G Rated voltage	
1	2-position single solenoid	C8	φ8 push-in joint	Blank	None	2	2stations	1	AC100V
2	2-position double solenoid	C10	φ10 push-in joint	K	External pilot	~		3	DC24V
3	3-position all ports closed	C12	φ12 push-in joint	A	Cutting oil applicable product	15	Note 1	4	DC12V
4	3-position A/B/R connection	CX	Push-in joint mix	F	Built-in A · B port filter			5	AC110V
5	3-position P/A/B connection	10	Rc3/8	Z1	Air supply spacer				
8	Mix manifold	10G	G3/8	Z3	Exhaust spacer				
		10N	NPT3/8	Q	Supply/Exhaust block				

Note 1: For details about the maximum number of manifold links, see page

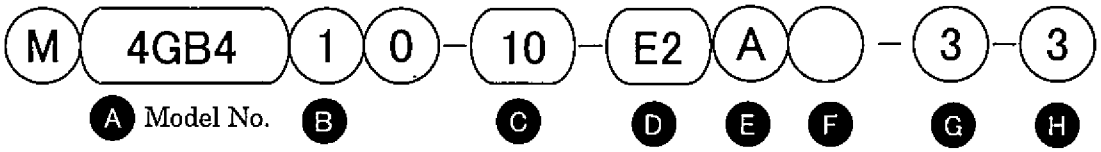
Ⓓ Electric connection	
Blank	Grommet lead wire
B	DIN terminal box (Pg7), surge absorber and lamp provided.
E-connector (upward/lateral common)	
E0	Lead wire (300mm)
E00	Lead wire (500mm)
E01	Lead wire (1000mm)
E02	Lead wire (2000mm)
E03	Lead wire (3000mm)
E2	Lead wire (300 mm), surge absorber and lamp provided.
E20	Lead wire (500 mm), surge absorber and lamp provided.
E21	Lead wire (1000 mm), surge absorber and lamp provided.
E22	Lead wire (2000 mm), surge absorber and lamp provided.
E23	Lead wire (3000 mm), surge absorber and lamp provided.
E0N	No lead wire (no socket)
E2N	No lead wire (no socket), surge absorber and lamp provided.
E3	No lead wire (socket and terminal provided), surge absorber and lamp provided.
E1	No lead wire (socket and terminal provided)
EJ-connector (socket with cover, upward/lateral common)	
E01J	Lead wire (1000mm)
E02J	Lead wire (2000mm)
E03J	Lead wire (3000mm)
E21J	Lead wire (1000 mm), surge absorber and lamp provided.
E22J	Lead wire (2000 mm), surge absorber and lamp provided.
E23J	Lead wire (3000 mm), surge absorber and lamp provided.

See also the catalog for further information.

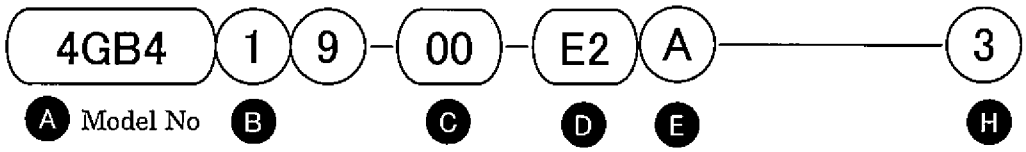
Discontinue

4) Individual wiring manifold: Base piping

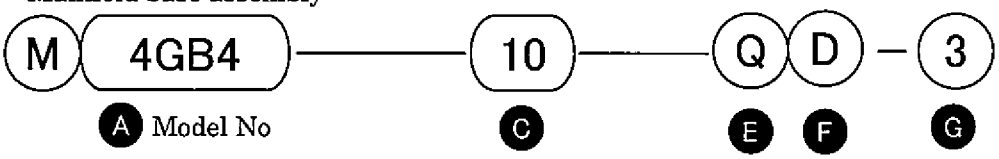
Manifold number



Individual valve for base mounting



Manifold base assembly



B Solenoid position		C Port size		Option		F Mount type Note 2	
1	2-position single solenoid	C8	φ8push-in joint	Blank	None	Blank	Direct mount
2	2-position double solenoid	C10	φ10 push-in joint	K	External pilot	D	DIN rail mount type
3	3-position all ports closed	C12	φ12 push-in joint	A	Cutting oil applicable product		
4	3-position A/B/R connection	CX	Push-in joint mix	F	Built-in A·B port filter		
5	3-position P/A/B connection	08	Rc1/4	Z1	Air supply spacer		
8	Mix manifold	10	Rc3/8	Z3	Exhaust spacer		
		15	Rc1/2	Q	Supply/Exhaust block		
		08G	G1/4				
		10G	G3/8				
		15G	G1/2				
		08N	NPT1/4				
		10N	NPT3/8				
		15N	NPT1/2				

G Station number		H Rated voltage	
2	2stations	1	AC100V
~		3	DC24V
15	Note 3	4	DC12V
		5	AC110V

Note 1 : Two kinds of bases are provided for each port diameter of P·R1·R2 port (Rc3/8, Rc1/2).
An appropriate base can be automatically selected according to the selection type of the Port size.
Take great care since the outside dimensions may vary.

Note 2 : DIN rail mounting is only the base for P·R1·R2 port Rc3/8 and it is not applicable to the external pilot. Additionally, select a supply/exhaust block for DIN rail mounting. The maximum number of links is 5.

Note 3 : For details about the maximum number of manifold links, see page 43.

Ⓓ Electric connection	
Blank	Grommet lead wire
B	DIN terminal box (Pg7), surge absorber and lamp provided.
E-connector (upward/lateral common)	
E0	Lead wire (300mm)
E00	Lead wire (500mm)
E01	Lead wire (1000mm)
E02	Lead wire (2000mm)
E03	Lead wire (3000mm)
E2	Lead wire (300 mm), surge absorber and lamp provided.
E20	Lead wire (500 mm), surge absorber and lamp provided.
E21	Lead wire (1000 mm), surge absorber and lamp provided.
E22	Lead wire (2000 mm), surge absorber and lamp provided.
E23	Lead wire (3000 mm), surge absorber and lamp provided.
E0N	No lead wire (no socket)
E2N	No lead wire (no socket), surge absorber and lamp provided.
E3	No lead wire (socket and terminal provided), surge absorber and lamp provided.
E1	No lead wire (socket and terminal provided)
EJ-connector (socket with cover, upward/lateral common)	
E01J	Lead wire (1000mm)
E02J	Lead wire (2000mm)
E03J	Lead wire (3000mm)
E21J	Lead wire (1000 mm), surge absorber and lamp provided.
E22J	Lead wire (2000 mm), surge absorber and lamp provided.
E23J	Lead wire (3000 mm), surge absorber and lamp provided

See also the catalog for further information.

[SM-P00029-A/3]

Discontinue

8.3 Related equipment

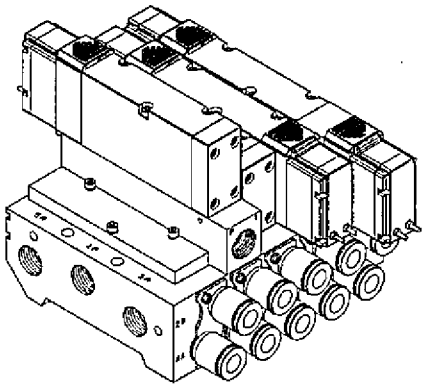
1) Air supply spacer

Individual model No. indication

4GA4
4GB4 — P — 10
A

A Port size	
10	Rc3/8
10G	G3/8
10N	NPT3/8

4GB4 air ply spacer



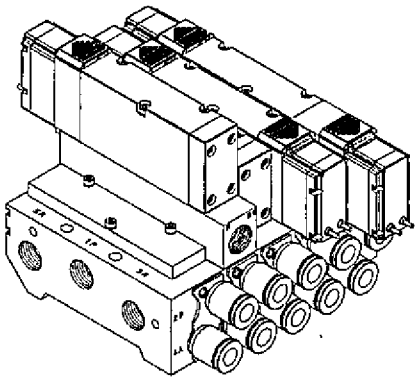
2) Exhaust spacer

Individual model No. indication

4GA4
4GB4 — R — 10
1

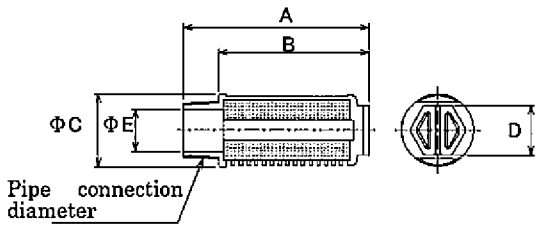
A Port size	
10	Rc3/8
10G	G3/8
10N	NPT3/8

4GB4 exhaust spacer



3) Silencer

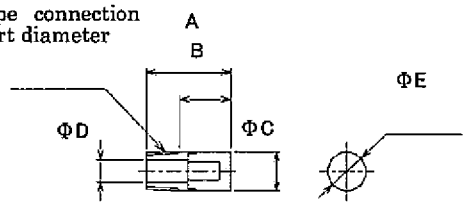
(1) SLW-6A,10A,10L,15A



Symbol Model No.	Silencing effect d B (A)	Effective sectional area mm²	A	B	C	D	E	Port size
SLW-6A	30 or more	10	34.5	28	16.5	10	7	R1/8
SLW-8A	30 or more	20	44.5	36	20	13	8.5	R1/4
SLW-8L	30 or more	30	57.4	48.5	25.5	17	8.5	R1/4
SLW-10A	30 or more	30	58.5	48.5	25.5	17	12	R3/8
SLW-10L	30 or more	60	68.2	58.4	28	19	12	R3/8
SLW-15A	30 or more	75	71.4	58.4	28	19	15	R1/2

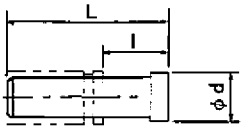
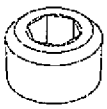
(2) SLW-6S

Pipe connection port diameter



Model No.	Port size	A	B	C	D	E
SLW-6S	R1/8	22	13.3	10.5	6	10.5

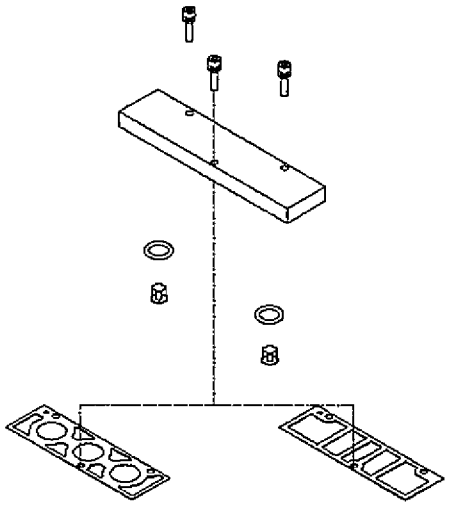
(3) Plugs

Part name	Model No.	Appearance
Blank plug	GWP8−B GWP10−B GWP12−B	
Screw plug	4G4−8P 4G4−10P 4G4−15P	

Model No.	D	L	l	d
GWP8-B	ϕ8	33	14	10
GWP10-B	ϕ10	40	18.5	12
GWP12-B	ϕ12	43	20	14

6) Masking plate kit

(1) For 4GA4
4GA4−MP
(2) For 4GB4
4GB4−MP



A-type gasket B-type gasket

* Contents of kit: Masking plate, gasket (select either A-type or B-type.), mounting screw (3 pcs.), O-ring (2 pcs.), PR check valve (2 pcs.)

7) E type connector socket assembly

4G4−SOCKET−ASSY− [Electric connection] (D) − [Rated voltage] (H)

(D) Electric connection	
Blank	Grommet lead wire
B	DIN terminal box (Pg7), surge absorber and lamp provided.
E-connector (upward/lateral common)	
E0	Lead wire (300mm)
E00	Lead wire (500mm)
E01	Lead wire (1000mm)
E02	Lead wire (2000mm)
E03	Lead wire (3000mm)
E2	Lead wire (300 mm), surge absorber and lamp provided.
E20	Lead wire (500 mm), surge absorber and lamp provided.
E21	Lead wire (1000 mm), surge absorber and lamp provided.
E22	Lead wire (2000 mm), surge absorber and lamp provided.
E23	Lead wire (3000 mm), surge absorber and lamp provided.
E0N	No lead wire (no socket)
E2N	No lead wire (no socket), surge absorber and lamp provided.
E3	No lead wire (socket and terminal provided), surge absorber and lamp provided.
E1	No lead wire (socket and terminal provided)
EJ-connector (socket with cover, upward/lateral common)	
E01J	Lead wire (1000mm)
E02J	Lead wire (2000mm)
E03J	Lead wire (3000mm)
E21J	Lead wire (1000 mm), surge absorber and lamp provided.
E22J	Lead wire (2000 mm), surge absorber and lamp provided.
E23J	Lead wire (3000 mm), surge absorber and lamp provided.

(H) Rated voltage	
1	AC100V
3	DC24V
4	DC12V
5	AC110V

8) EJ type connector socket assembly

4G−SOCKET−ASSY− [Electric connection] (D)

9) Cartridge type push-in joint

Part name	Model No.
φ8straight type push-in joint	4G4-JOINT-C8
φ10straight type push-in joint	4G4-JOINT-C10
φ12straight type push-in joint	4G4-JOINT-C12