CKD

SM-P00079-A/1

INSTRUCTION MANUAL

3,5 port pneumatic master valve

(M)3GA R SERIES
(M)4GA/B R SERIES

- Discrete valve
- Manifold (Metal base)

- 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.

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.

   ISO4414, 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.

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■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 master 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 master 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.
- Foreign matter may go into the inside of a master valve by the direction of an exhaust port, which may cause inhalation of foreign matter near the exhaust port. Attach a silencer to the exhaust port or have the exhaust port face downward.

b) Keep the master valve system dry. Take care to avoid direct contact with dripping water or splashes of cutting oil.
- If the master valve system is wet by a direct contact with water or cutting oil, an electrical leak may result. Protect the master valve system by using a cover or by installing it inside a paneled casing. If the cylinder rod is splashed with cutting oil, the oil may penetrate through the cylinder into the secondary side piping of the master valve. This must be prevented to avoid malfunctions.

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

d) Vibration resistance and Shock resistance
Do not subject the master valve system to vibrations 50m/s^2 or stronger or shocks 300m/s^2 or stronger.

e) Avoid using the master valve system in a humid environment because the humidity is likely to cause condensation with a change in the temperature.

f) The packing and gaskets may deteriorate sooner than usual if used in an atmosphere with a higher than normal density of ozone (for example, the atmosphere near a beach or in an area with frequent thunderstorms).

g) Do not use the normal type master 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 master valve unit, never attempt to hold it in position by means of the pipes connected to it.

- Mount the master valve by applying the mounting screws and/or mounting plate to the master valve.
- Tighten the screws with proper torque. If the assembly or tightening is not conducted properly, it may cause some air leakage, falling-off of products, screw damaging or deform of DIN rail.

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

- If the manifold weights more than 1 kg, or when using in an environment with vibration or shock, fix the DIN rail onto the surface at 50 to 100mm spacing.
- 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 master 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 master 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 master 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.

Check valve (Section 5.1)

WARNING : The exhaust check valve blocks the back pressure from adjacent air device, etc. However, the structure does not allow the pressure seal to be held continuously, so do not use for purposes other than the back pressure block.

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) Basically the product is designed as oilless specifications, however if you prefer to supply oil, use the class 1 turbine oil (additive-free) ISO VG32.
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.

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 REASSEMBLY (Section 6.2.)

WARNING : Before increase or decrease block of manifold, cut the supply of compressed air.

WARNING : Please avoid disassembling and reassembling the master valve, otherwise the sealing and drip proof performance may deform.

- Disassembled and Reassembled product by the customer will not be guaranteed.

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 master 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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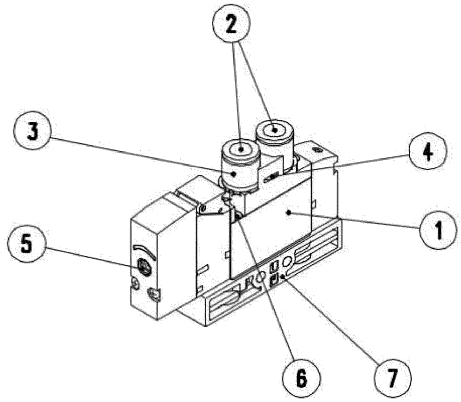
3,5 port pneumatic master valve

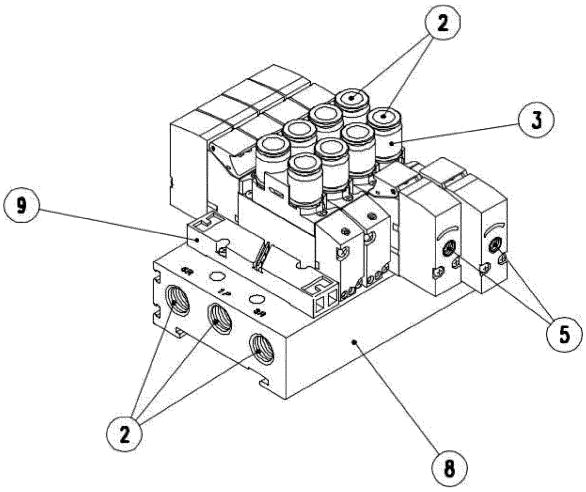
(M)3GA/B R SERIES. (M)4GA/B R SERIES.

Instruction Manual No. SM-P00079-A

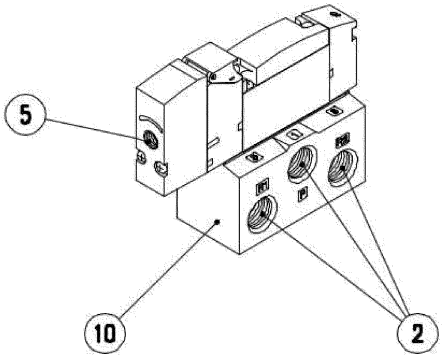
1. PRODUCT



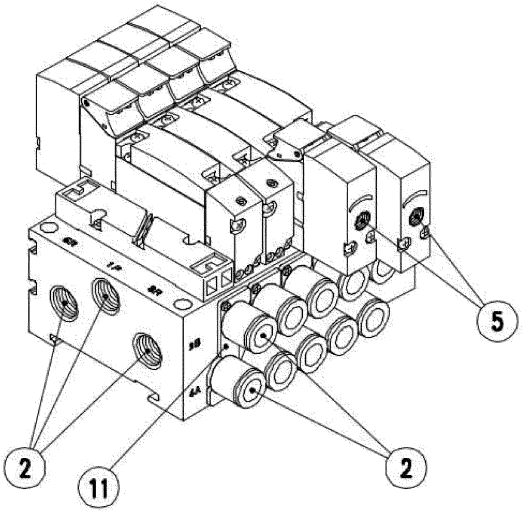
Body piping type



Body piping type manifold



Base piping type



Base piping type manifold

No	Parts name	Description
①	Discrete master valve	There are body piping type and base piping type.
②	Piping port	“P”, “R”, and “A, B” show the supply, exhaust, and output ports, respectively.
③	Fitting	A replaceable cartridge type push-in fitting.
④	Fitting stopper pin	Secures cartridge type push-in fitting or like.
⑤	Pilot air piping port	Pilot air supply port (PA, PB)
⑥	Mounting screw	Two screws are provided for each discrete valve so as to fix the discrete valves to various bases.
⑦	Piping adaptor	Supplied attached to the body porting discrete valve.
⑧	Manifold base	
⑨	Masking plate	Removed when an additional valve unit is installed.
⑩	Sub plate	In case of a discrete specification, assemble this sub base.
⑪	Fitting stopper plate	Secures cartridge type push-in fitting or like.

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 master valve is free. The position of the 4(A) and 5(R1) ports for 4G R 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 master 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 master 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.
- Foreign matter may go into the inside of a master valve by the direction of an exhaust port, which may cause inhalation of foreign matter near the exhaust port. Attach a silencer to the exhaust port or have the exhaust port face downward.

b) Keep the master valve system dry. Take care to avoid direct contact with dripping water or splashes of cutting oil.
- If the master valve system is wet by a direct contact with water or cutting oil, an electrical leak may result. Protect the master valve system by using a cover or by installing it inside a paneled casing. If the cylinder rod is splashed with cutting oil, the oil may penetrate through the cylinder into the secondary side piping of the master valve. This must be prevented to avoid malfunctions.

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

d) Vibration resistance and Shock resistance
Do not subject the master valve system to vibrations 50m/s^2 or stronger or shocks 300m/s^2 or stronger.

e) Avoid using the master valve system in a humid environment because the humidity is likely to cause condensation with a change in the temperature.

f) The packing and gaskets may deteriorate sooner than usual if used in an atmosphere with a higher than normal density of ozone (for example, the atmosphere near a beach or in an area with frequent thunderstorms).

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

4.2 Installation

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

- Mount the master valve by applying the mounting screws and/or mounting plate to the master valve.
- Tighten the screws with proper torque. If the assembly or tightening is not conducted properly, it may cause some air leakage, falling-off of products, screw damaging or deform of DIN rail.

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

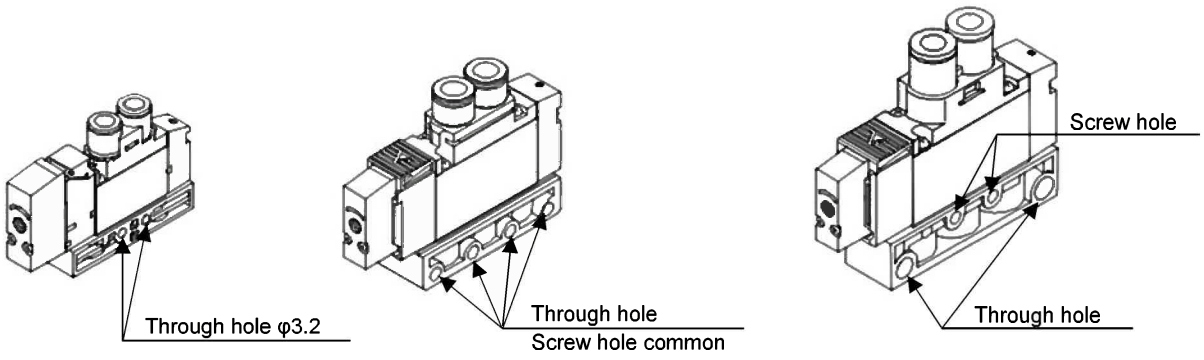
- If the manifold weights more than 1 kg, or when using in an environment with vibration or shock, fix the DIN rail onto the surface at 50 to 100mm spacing.
- If the strength is insufficient, mount the manifold base directly.

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

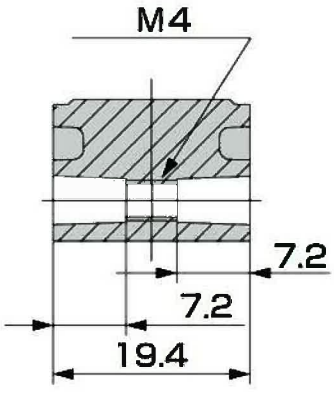
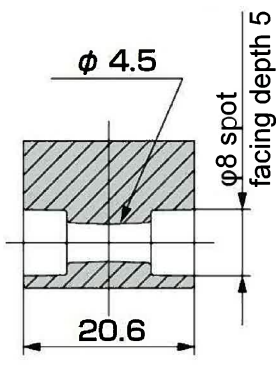
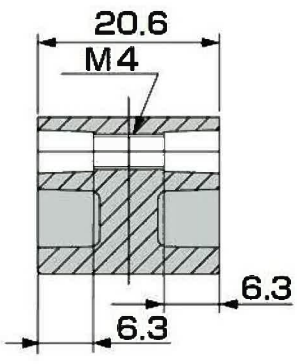
4.2.1 How to install discrete direct piping

1) When directly installing the manifold
The discrete direct piping type 4GA2/4GA3 R series can be installed using through hole or screw hole.
When using the screw holes , recommended tightening torque is 0.7 - 1.2N·m.
(For the 4GA1 R series, through holes only)

●4GA1 R Series ●4GA2 R Series ●4GA3 R Series

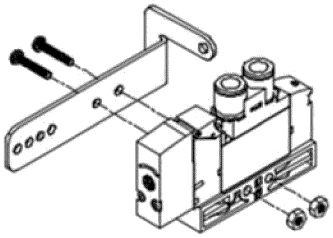


Mounting hole shape

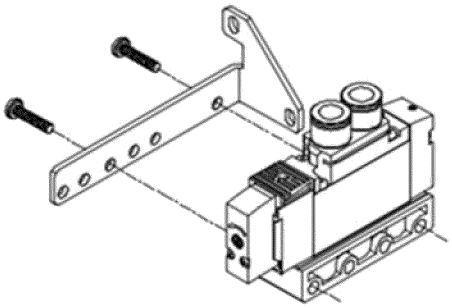
	4GA2 R Series	4GA3 R Series	
	Through hole/ screw hole common use	Through hole	Screw hole
Sectional view of mounting hole			

2) When installing the manifold with mounting plate (P)
Installation method of the mounting plate (P) for discrete direct piping type is available only for the single.
Be careful for the mounting position and direction since damage could be occurred if incorrectly installed.

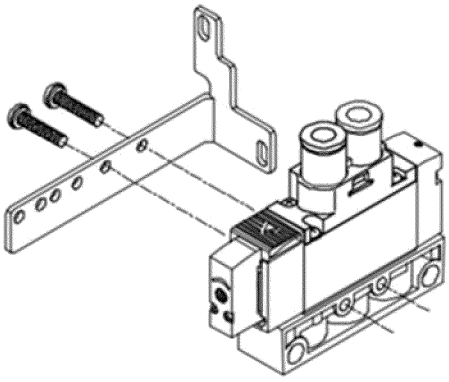
●4GA1 R Series



●4GA2 R Series

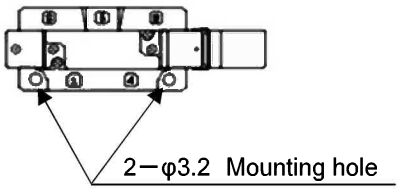


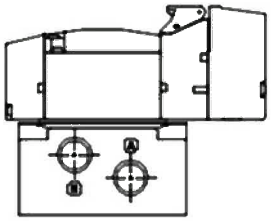
●4GA3 R Series



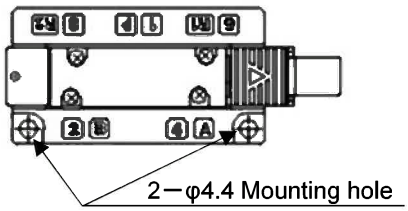
4.2.2 Mounting method of individual valve sub base type

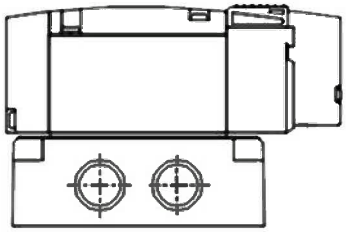
●4GB1 R Series



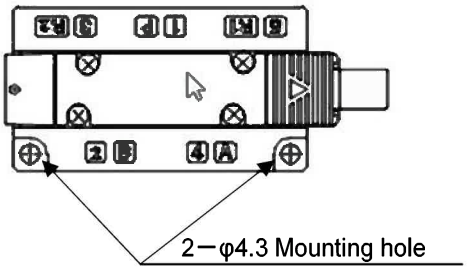


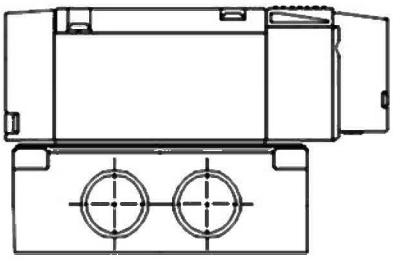
●4GB2 R Series





●4GB3 R Series



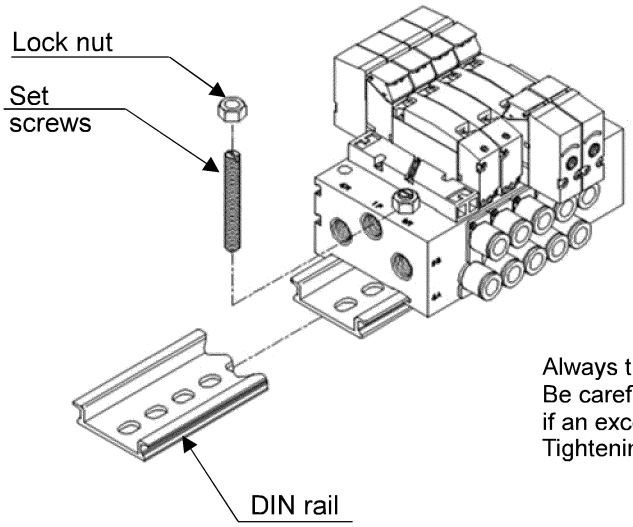


4.2.3 How to install manifold

1) How to install DIN rail

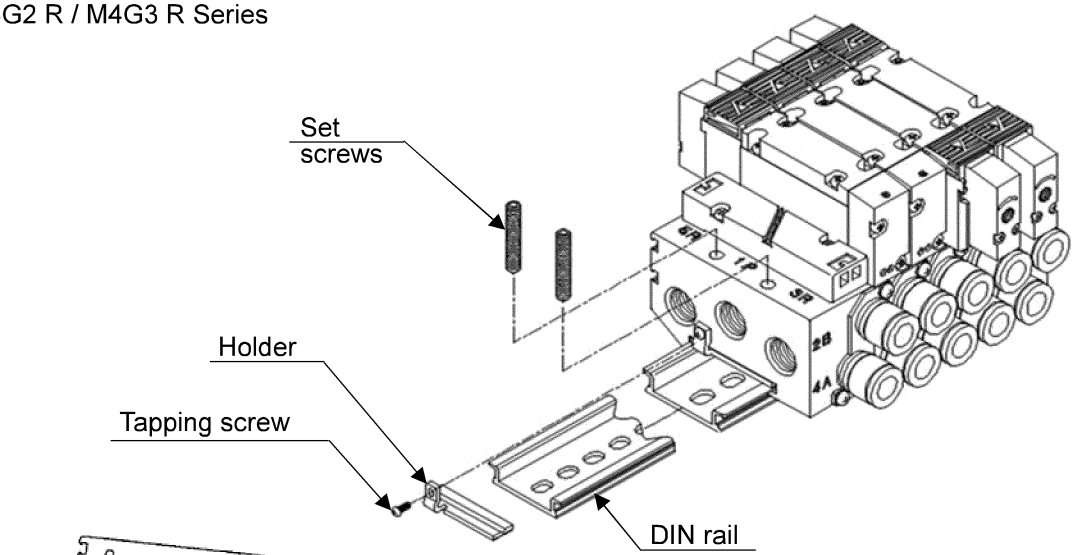
A DIN rail mounting type manifold (Option symbol “D”) or a direct mounting type manifold which is modified using the DIN rail kit can be mounted on the DIN rail. If not mounted correctly, this may cause the manifold to drop or be damaged. Carefully check this point. Fix the DIN rail on the mounting surface 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.

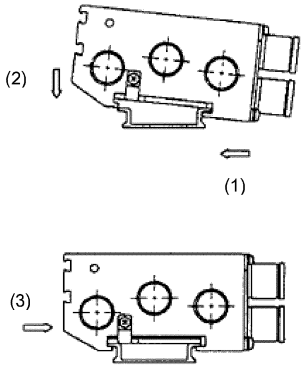
●M4G1 R Series



Always tighten the lock nut.
Be careful that the DIN rail may deform if an excessive tightening torque is applied.
Tightening torque 0.3 to 0.5 N·m

●M4G2 R / M4G3 R Series





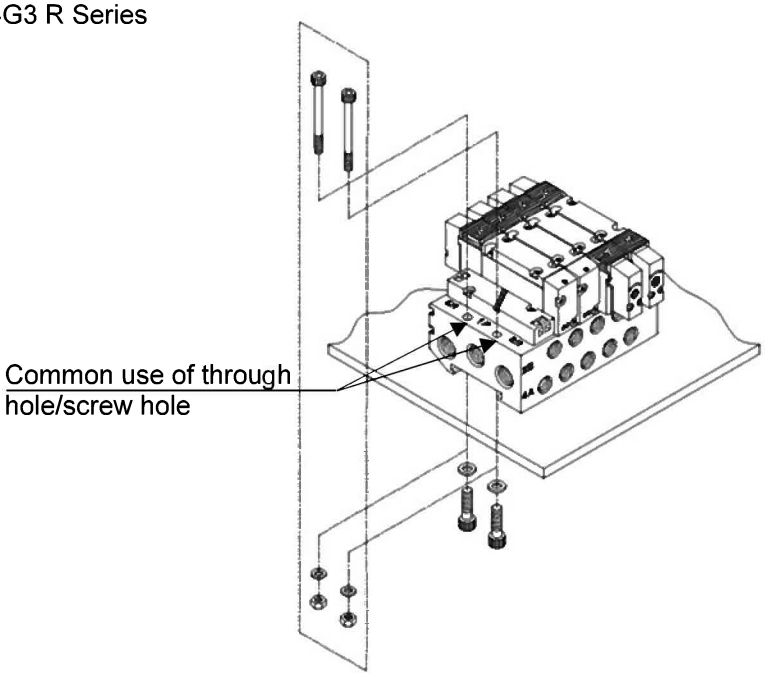
1. Attach the holder (Tightening with tapping screw for preventing drop off)
2. Temporally set the set screw.
3. Catch the jaws into the DIN rail in the order of (1) (2).
4. Apply pushing force to the direction of (3).
5. Tighten the set screw.
   Tightening torque 0.7 to 1.0 N·m

2) When directly installing the manifold

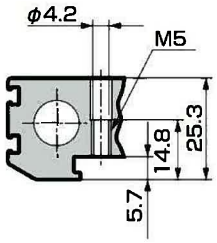
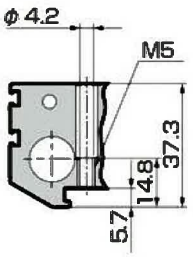
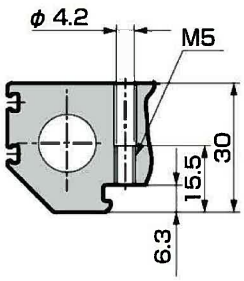
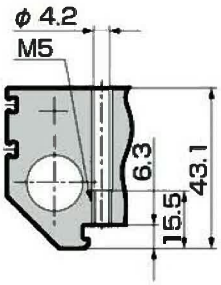
M4G2/M4G3 R series, through hole or screw hole is available for installation.

When using the female screw, 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 R series, through holes only.) If not mounted correctly, this may cause the damage to the screws.

●M4G2 R / M4G3 R Series



Mounting hole shape (Sectional view)

	Body piping[M4GA R]	Base piping[M4GB R]
M4G2 R		
M4G3 R		

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 master 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 master 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 master valve.

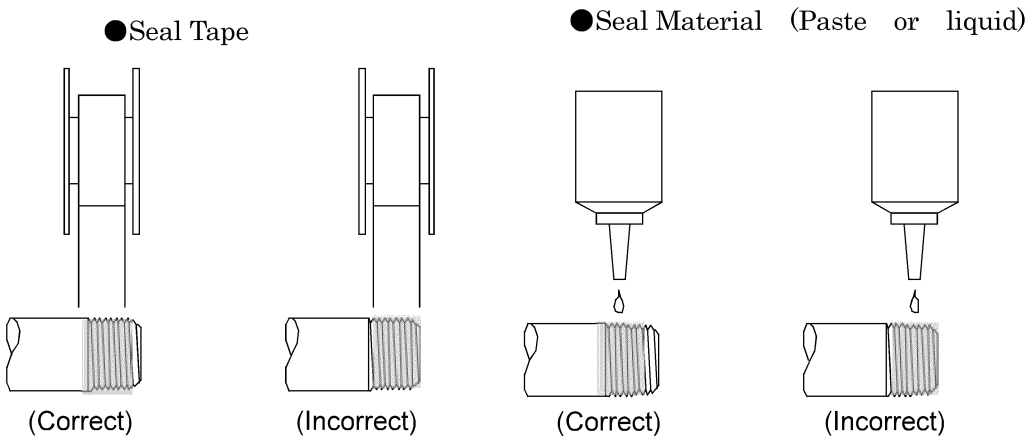
g) Air supply
- Do not restrict the flow of air through the air supply piping. With a manifold system with multiple stations, a drop in the air supply pressure may cause trouble through a delay in the operation timing.

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, master 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.

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 master valve.

4.3.6 Pipe connections

(1) Tubes to be used

For use with master 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	Urethane
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
Urethane φ4, φ6	+0.1mm -0.15mm
Urethane 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	Urethane
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

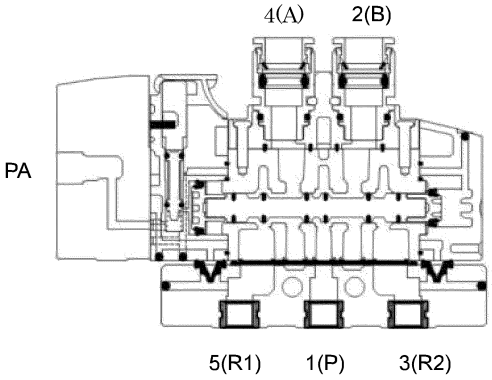
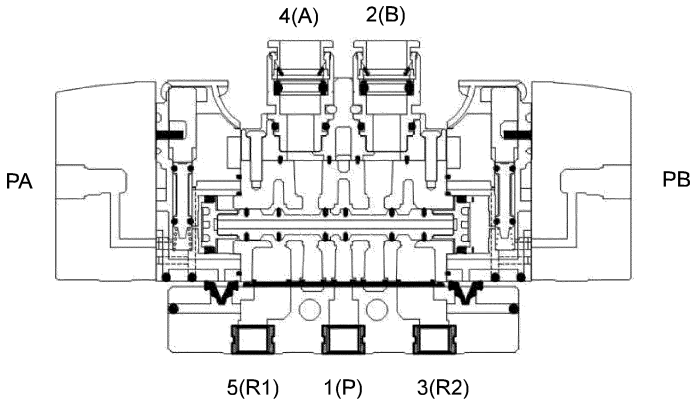
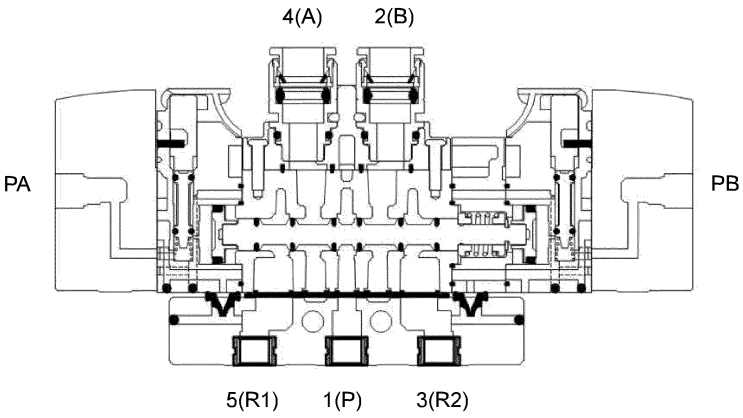
For use with a master valve with a push-in joint, select the blank plug specified by us:

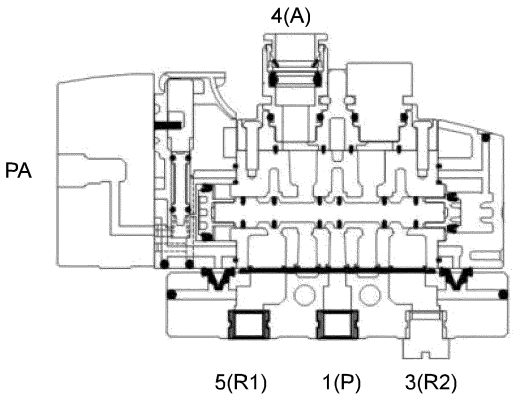
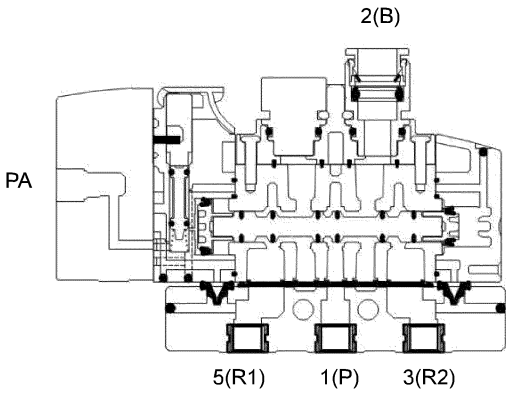
Blank plug GWP□-B Series

5. PROPER OPERATION

5.1 Description of operation

1) Valve operation

	Operation diagram (4GA1 R series as an example)	Description of operation
4G※※10R Single		PA without pressurized (As shown in the diagram) 1(P) → 2(B) 4(A) → 5(R1) PA pressurized 1(P) → 4(A) 2(B) → 3(R2)
4G※※20R Double		PA pressurized 1(P)→4(A) 2(B)→3(R2) PB pressurized (As shown in the diagram) 1(P)→2(B) 4(A)→5(R1) The change-over position is retained even after the air is cut off.
4G※※30R 4G※※40R 4G※※50R 3-Position		4G※※30R PA without pressurized 1(P), 4(A), 2(B), 5(R1), 3(R2) close 4G※※40R PA without pressurized 1(P) close 4(A), 2(B) → 5(R1), 3(R2) 4G※※50R PA without pressurized 1(P) → 4(A), 2(B) 5(R1), 3(R2) close

	Operation diagram (4GA1 R series as an example)	Description of operation
3G※※10R Normally Closed		PA without pressurized (As shown in the diagram) 4(A) → 5(R1) PA pressurized 1(P) → 4(A)
3G※※110R Normally Opened		PA without pressurized (As shown in the diagram) 1(P) → 2(B) PA pressurized 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) Check valve

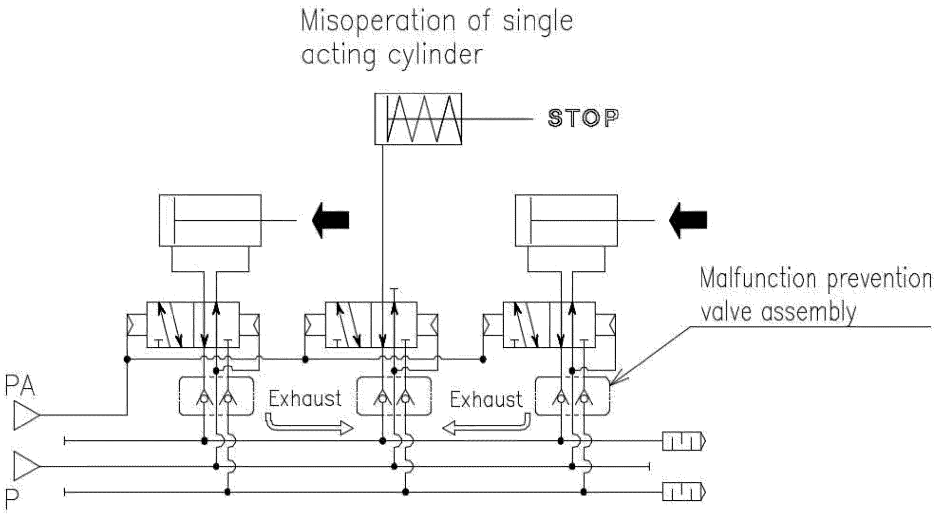
A PR check valve is provided as a standard option. An exhaust malfunction prevention valve is provided when optionally selecting the symbol H.

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

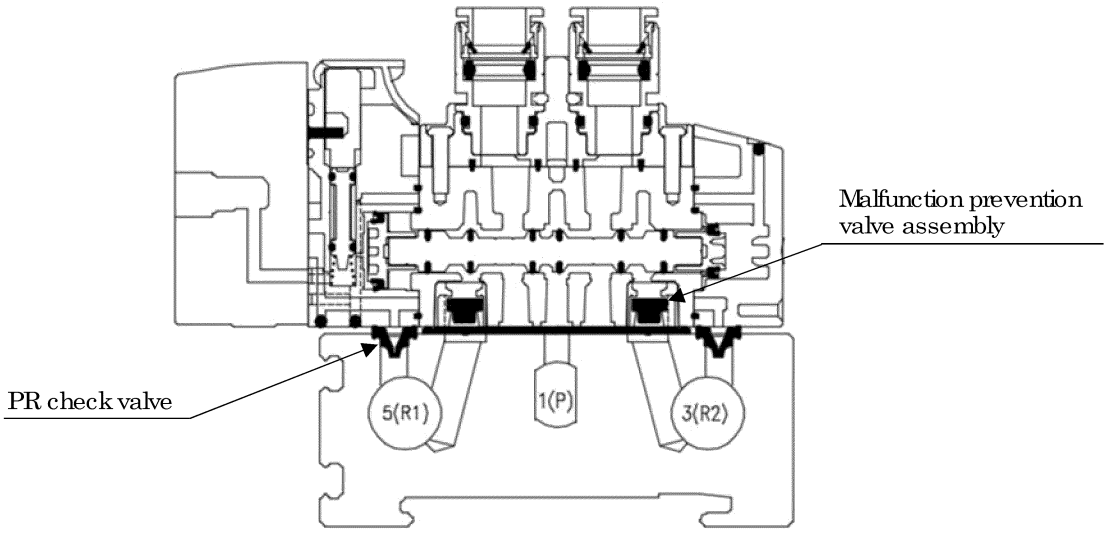
A single and/or a double cylinder connected to an ABR connection valve by the manifold may malfunction due to introduction of back pressure generated when other cylinders are driven. To prevent this malfunction, a gasket with a "malfunction prevention valve" can be selected. It cannot be selected for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

Note: Check valve is a check valve. Note that when operating the cylinder rod directly without pressurized, the check valve opens and the cylinder rod does not move.

4G R Series pneumatic pressure system



Internal structure drawing



5.2 Manual operation

⚠ 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.

(1) The 4G R series is a pilot operated master valve. If air is not supplied to P port, the main valve does not switch even if the manual override is operated.

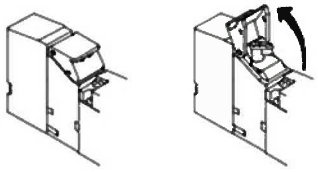
(2) Manual override protective cover is provided as standard. Since the manual override protective cover is closed when shipped out of the factory, the manual override is protected and cannot be seen when delivered. Open the protective cover and manually operate the device.
Note that the protection cover does not close unless the locking manual operating device is unlocked.

(3) Manual override is used for both non-locking and locking. The lock is applied by pressing down and turning manual override. For locking, be sure to press down and turn. If turned without being pressed down, it could damage the manual override device or air could leak.

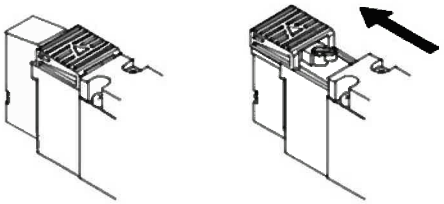
5.2.1 Opening and closing the manual protective cover.

Do not apply excessive force to the manual protection cover when opening and closing the cover.
Excessive external force could cause failures. (Below 5 N)

●4G1 R Series

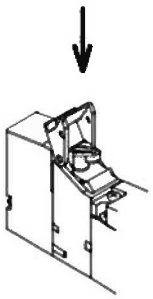


●4G2・3 R Series

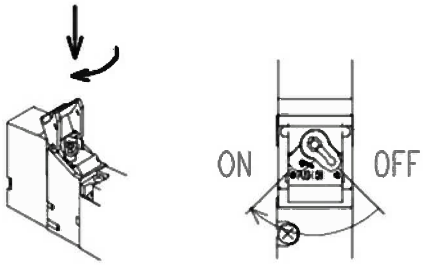


5.2.2 How to operate manual override

(1) Push & non-locking operation
Push straight in the direction of the arrow until it stops.
Manual override is unlocked when released.



(2) Push & locking operation
Push manual override and turn 90° in the direction of the arrow.
Manual override is not unlocked even when released.



5.3 Air quality

⚠ WARNING :
a) Do not supply anything other than compressed air.
b) Use clean compressed air that does not contain corrosive gases.

⚠ 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) Basically the product is designed as oil less specifications, however if you prefer to supply oil, use the class 1 turbine oil (additive-free) ISO VG32. 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.

5.3.1 Lubrication

Generally, the 4G R 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.

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) Use compressed air that does not contain oxidized oil, tar, carbon, etc., from the air compressor.
   (1) If oxidized oil, tar, or carbon enter the pneumatic components and solidify, resistance at the sliding section will increase, and could lead to operation faults.
   (2) If the supplied lubricant mixes in with oxidized oil, tar, carbon, etc., the sliding section of the pneumatic components could be worn.
2) Use compressed air that does not contain solid foreign matter.
   (1) Solid foreign matter in compressed air could enter the air compressor and cause wear at the sliding section or could cause sticking.

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).

6. MAINTENANCE

6.1 Periodic inspection

⚠ WARNING:	Before conducting maintenance, turn the power off, stop the supply of compressed air and make sure that there is no residual pressure. ・Observe the condition to ensure safety.

⚠ CAUTION:	Conduct daily inspections and regular inspections to ensure that maintenance control is performed correctly. ・If maintenance is not correctly controlled, the product's functions could drop markedly and lead to a shortened life, damage, malfunctions, faults, and accidents.

1) To use the master 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) Pressure management of supplied compressed air:
Is the set pressure supplied?
Does the pressure gauge indicate the set pressure during operation of the device?
(2) Control of pneumatics filter:
Is the drain correctly discharged?
Is the bowl or element clean enough to use?
(3) Control of compressed air leaks from piping connections:
Is the state of the connection, especially at movable sections, normal?
(4) Valve operational status control:
Are operations delayed? Is exhaust normal?
(5) Control of pneumatic actuator operation:
Are operations smooth? Is the end stopping status normal? Is the connecting portion with the load normal?
(6) Control of lubricator:
Is the oil rate correctly adjusted?
(7) Control of lubricant:
Is the regular lubricant supplied?

6.2 Disassembly and reassembly

⚠ WARNING: Before increase or decrease block of manifold, cut supply of compressed air.

⚠ WARNING: Please avoid disassembling and reassembling the master valve, otherwise the sealing and drip proof performance may deform.

・Disassembled and Reassembled product by the customer will not be guaranteed.

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

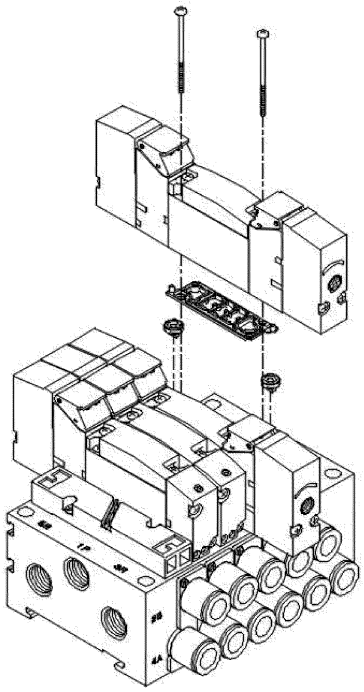
・You are required to understand the structure of master valve and its operation principle to secure the safety.

・A level of 2nd Class or more of Pneumatics Technology Certification is required.

6.2.1 Replacement of master valve

When replacing the master 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 R	M1.7	0.18～0.22
4G2 R	M2.5	0.35～0.40
4G3 R	M3	0.6～0.7

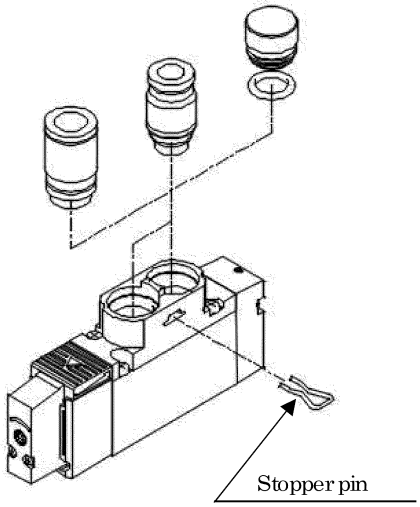


6.2.2 How to replace cartridge fitting

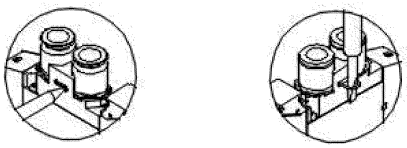
Check procedures before changing the push-in fitting size. If installed not correctly, or if the tightening of the set screw is insufficient, leakage could be occurred.

1) Direct piping (4GA R) type

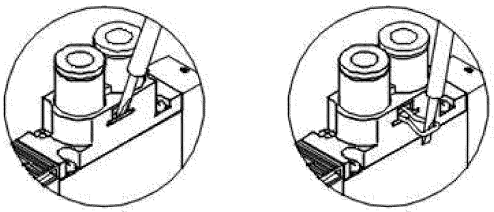
(1) Remove the stopper pin with a screwdriver.
(2) Pull the joint out.
(3) Insert the joint for replacement vertically until it reaches the back.
(4) Insert the stopper pin. Pull on the fitting and confirm that it is installed correctly.



4GA1 R



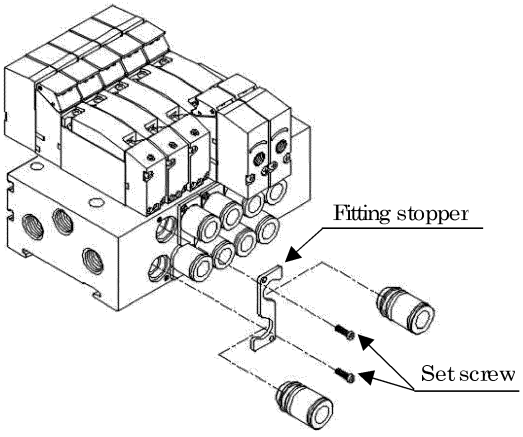
4GA2 R/4GA3 R



2) Base piping (4GB R) type

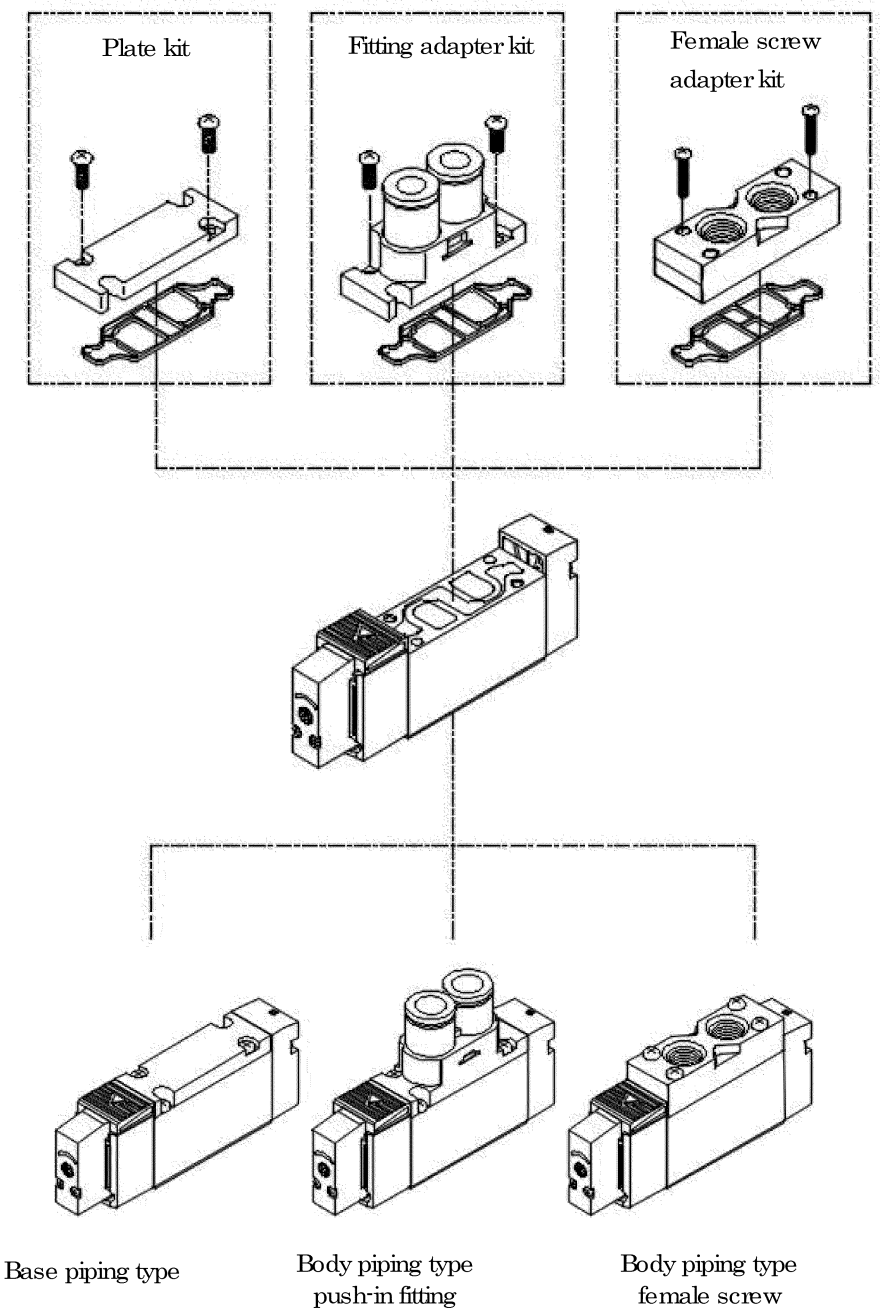
(1) Remove the set screw.
(2) Pull out the fitting stopper with the joint.
(3) Align the groove of the replacement fitting with the fitting stopper and assemble them temporarily.
(4) Assemble the fitting stopper with the fitting, and tighten the set screw. Pull on the fitting and confirm that it is installed correctly.

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



6.2.3 How to change piping connection specification

When replacing the plate or fitting adaptor attached to the body to change the type between the body piping specification and the base piping specification, or to change the type between the push-in fitting specification and the female specification for the body piping type, pay attention to the tightening torque because air could leak if the tightening of the set screw is insufficient at the time of replacement.



Model number	Size	Tightening touque(N·m)
4G1 R	M1.7	0.18 to 0.22
4G2 R	M2.5	0.25 to 0.30
4G3 R	M3	0.6 to 0.7

7. TROUBLE SHOOTING

TROUBLE SHOOTING

Motion troubles	Suspected cause	Remedies
Does not actuate	No pilot signals	Repair the air circuit
	Pilot pressure is low.	Adjustment of the pilot pressure
Malfunctions	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	Rectify the piping 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.)
	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.
	Foreign particles cut into packing lips	Remove the foreign particle away from the packing.
malfunction when using manifoldly	Next cylinder projecting	After pressurizing pilot air in a valve of the cause, other valves operate. Establishment of cylinder lock mechanism.

8. PRODUCT SPECIFICATIONS AND HOW TO CODE MODEL NUMBERS

8.1 Product specifications

1) Common specifications

(1)Discrete master valve

Model number		3GA R、4GA/B R
Item		Discription
Valve type and operation		Pilot operated type soft spool valve
Working fluid		Compressed air
Proof pressure	MPa	1.05
Ambient temperature	℃	-5～55 (No freezing)
Manual operating device		Non-locking/locking common type
Pilot exhaust method		Main valve/pilot valve common exhaust type
Fluid temperature	℃	5～55
Lubrication	[Note 1]	Not required
Degree of protection	[Note 2]	Dust-proof
Vibration resistance	m/s^2	50 or less
Shock resistance	m/s^2	300 or less
Atmosphere		Containing corrosive gas is not permissible
Main pressure	MPa	0.2～0.7
Pilot pressure	MPa	(0.6×main pressure+0.06)～0.7

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.

(2)Manifold

Model number Item	M3GA R、M4GA/B R
Manifold type	Integrated base
Discrete valve	3GA R、4GA/B R series
Station no.	2 to 20 stations
Supply and exhaust method	Common supply/common exhaust

2) Flow characteristics

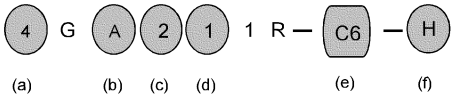
	Model no.	Position type		1(P)→4(A)/2(B)		4(A)/2(B)→5(R1)/3(R2)	
				C[dm^3/(s/bar)]	b	C[dm^3/(s/bar)]	b
Discrete	3GA1 R 4GA1 R	2-position		1.2	0.47	0.72	0.37
		3-position	All ports closed	1.1	0.39	0.70	0.34
			ABR port connection	1.1	0.33	0.72	0.34
			PAB port connection	1.3	0.61	0.72	0.36
	3GA2 R 4GA2 R	2-position		2.4	0.33	2.8	0.30
		3-position	All ports closed	2.2	0.28	2.5	0.28
			ABR port connection	2.3	0.26	2.8	0.27
			PAB port connection	2.5	0.38	2.4	0.30
	3GA3 R 4GA3 R	2-position		3.4	0.29	4.0	0.24
		3-position	All ports closed	3.1	0.27	3.4	0.28
			ABR port connection	3.1	0.33	4.1	0.20
			PAB port connection	3.5	0.43	3.4	0.32
	3GB1 R 4GB1 R	2-position		1.3	0.27	1.2	0.22
		3-position	All ports closed	1.1	0.31	1.1	0.27
			ABR port connection	1.1	0.31	1.3	0.29
			PAB port connection	1.4	0.30	1.1	0.26
	3GB2 R 4GB2 R	2-position		2.6	0.20	2.6	0.19
		3-position	All ports closed	2.3	0.32	2.2	0.22
			ABR port connection	2.2	0.23	2.6	0.16
			PAB port connection	2.4	0.10	2.4	0.22
	4GB3 R	2-position		4.3	0.24	4.2	0.24
		3-position	All ports closed	3.3	0.40	3.4	0.27
			ABR port connection	3.3	0.36	4.2	0.18
			PAB port connection	4.5	0.28	3.4	0.30
Manifold	M3GA1 R M4GA1 R	2-position		0.99	0.20	1.2(0.70)	0.20(0.12)
		3-position	All ports closed	0.94	0.23	1.1 —	0.20 —
			ABR port connection	0.93	0.18	1.3(0.70)	0.23(0.02)
			PAB port connection	1.1	0.28	1.1 —	0.23 —
	M3GA2 R M4GA2 R	2-position		2.3	0.36	2.9(1.7)	0.24(0.33)
		3-position	All ports closed	2.1	0.35	2.5 —	0.32 —
			ABR port connection	2.2	0.37	2.9(1.8)	0.32(0.29)
			PAB port connection	2.4	0.34	2.5 —	0.33 —
	M3GA3 R M4GA3 R	2-position		3.2	0.37	3.8(2.5)	0.13(0.28)
		3-position	All ports closed	2.9	0.35	3.3 —	0.35 —
			ABR port connection	3.0	0.34	3.8(2.6)	0.12(0.27)
			PAB port connection	3.3	0.30	3.3 —	0.32 —
	M3GB1 R M4GB1 R	2-position		1.1	0.22	1.2(0.70)	0.20(0.10)
		3-position	All ports closed	0.98	0.22	1.1 —	0.24 —
			ABR port connection	0.97	0.35	1.3(0.68)	0.22(0.24)
			PAB port connection	1.1	0.38	1.1 —	0.21 —
	M3GB2 R M4GB2 R	2-position		2.4	0.34	2.7(1.7)	0.24(0.31)
		3-position	All ports closed	2.2	0.34	2.4 —	0.29 —
			ABR port connection	2.2	0.34	2.8(1.8)	0.24(0.27)
			PAB port connection	2.4	0.29	2.4 —	0.29 —
	M4GB3 R	2-position		3.5	0.34	3.8(2.6)	0.11(0.27)
		3-position	All ports closed	3.1	0.33	3.3 —	0.22 —
			ABR port connection	3.0	0.30	3.8(2.7)	0.11(0.22)
			PAB port connection	3.6	0.36	3.3 —	0.28 —

Note 1: Effective cross-sectional area S and sonic conductance C are converted as S 5.0 × C.

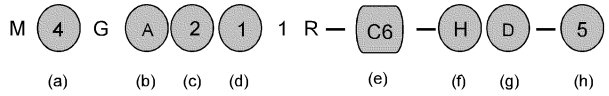
Note 2: Values for 2-position, ABR connection are the values when check valve is integrated.

8.2 How to code model numbers

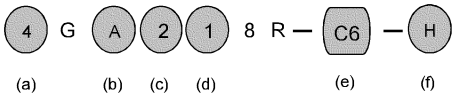
●Discrete master valve



●Manifold model no.



●Discrete master valve for manifold



(a) No.of port		(b) Piping direction		(c) Model no.		(d) Solenoid position	
Symbol	Discription	Symbol	Discription	Symbol	Discription	Symbol	Discription
3	3-port valve	A	Top(Direct piping)	1	(M)4G1R	1	2-position single
4	5-port valve	B	Side(Base piping)	2	(M)4G2R	2	2-position double
				3	(M)4G3R	3	3-position all ports closed
						4	3-position ABR connection
						5	3-position PAB connection
						1	Normal close NC (3GA)
						11	Normal close NO (3GA)

(e) Port size		(f) Option		(g) Mount type		(h) Station no.	
Symbol	Discription	Symbol	Blank	Blank	Direct mount type	Symbol	Discription
See Table1		H	With malfunction prevention valve	D	DIN rail mount type	2～20	Station no.
		P	With mounting plate				
		A	Ozone/cutting oil proof				
		F	A/B port filter integrated				
		Z1	Air supply spacer				
		Z2	In stop valve spacer				
		Z3	Exhaust spacer				

Table1 (e) Port size

Symbol	Discription	
Variation	A/B port Millimeter fitting・M5・Rc thread	P/R1/R2 port M5・Rc thread
C4	φ 4 push-in fitting	M5,Rc1/8
C6	φ 6 push-in fitting	M5,Rc1/8,Rc1/4,Rc3/8
C8	φ 8 push-in fitting	Rc1/4,Rc3/8
C10	φ10 push-in fitting	Rc3/8
CL4	L type φ 4 push-in fitting (upward)	Rc1/8
CL6	L type φ 6 push-in fitting (upward)	Rc1/8,Rc1/4
CL8	L type φ 8 push-in fitting (upward)	Rc1/4,Rc3/8
CL10	L type φ 10 push-in fitting (upward)	Rc3/8
CX	Push-in fitting mix	Rc1/8,Rc1/4,Rc3/8
M5	M5	M5,Rc1/8
06	Rc1/8	Rc1/8,Rc1/4
08	Rc1/4	Rc1/4,Rc3/8
10	Rc3/8	Rc3/8
00	Discrete valve for mounting base	-

Refer to catalog for details.

8.3 Related products

1) Mounting rail

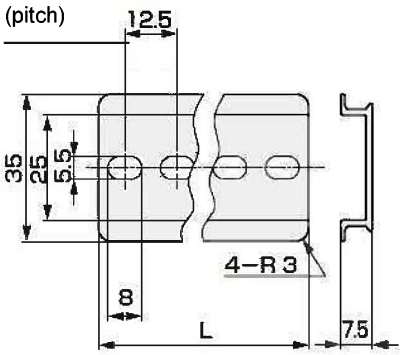
All the angular corners are rounded.

The mounting rail is cut at a mounting pitch of 12.5 mm.

N4GR-BAA＜Length＞

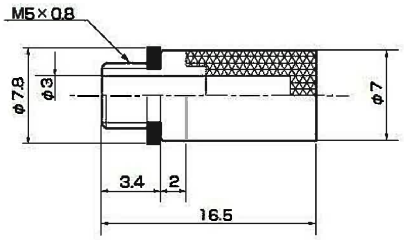
・The min. length is 87.5 mm.

・Select the length in pitches of 12.5 mm.

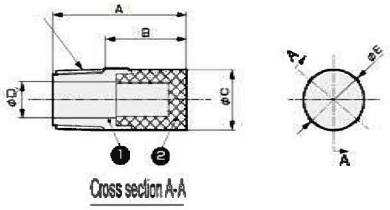


2) Silencer

●SLM-M5

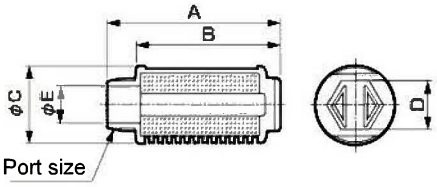


●SLW-6S,8S



Model no.	Port size	A	B	C	D	E
SLW-6S	R1/8	22	13.3	10.5	6	10.5
SLW-8S	R1/4	28	19	14.8	9	15.4

●SLW-6A,8A,10A,10L

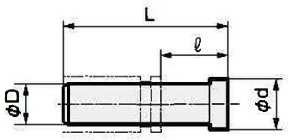


Model no.	Noise reduction effect dB(A)	Effective cross-sectional area mm²	A	B	C	D	E	Port size
SLW-6A	30 and over	10	34.5	28	16.5	10	7	R1/8
SLW-8A	30 and over	20	44.5	36	20	13	8.5	R1/4
SLW-10A	30 and over	30	58.5	48.5	25.5	17	12	R3/8
SLW-10L	30 and over	60	68.2	58.4	28	19	12	R3/8

Note 1: For mounting the silencer, check the dimensions in advance.

Note 2: Use SLW-8S for the M4GA2 R DIN rail mount type.
Interference occurs if SLW-8A is used.

3) Blanking plug



Model no.	D	L	ℓ	d
GWP4-B	φ4	27	16	6
GWP6-B	φ6	29	11.5	8
GWP8-B	φ8	33	14	10
GWP10-B	φ10	40	18.5	12

4) Thread plug

4G1R-M5P　　4G※R-※P

Model no.	Port size
4G1R-M5P	M5
4G2R-06P	Rc1/8
4G3R-08P	Rc1/4
4G3R-10P	Rc3/8

Refer to catalog for details.

8.4 Kit parts

2) Cartridge type push-in fitting model no.

Model no.	Parts name	Model no.
4G1 R	φ4 straight type	4G1R-JOINT-C4
	φ6 straight type	4G1R-JOINT-C6
	φ4 Short elbow type	4G1R-JOINT-CL4
	φ4 Long elbow type	4G1R-JOINT-CLL4
	φ6 Short elbow type	4G1R-JOINT-CL6
	φ6 Long elbow type	4G1R-JOINT-CLL6
	Plug cartridge	4G1R-JOINT-CPG
4G2 R	φ4 straight type	4G2R-JOINT-C4
	φ6 straight type	4G2R-JOINT-C6
	φ8 straight type	4G2R-JOINT-C8
	φ6 Short elbow type	4G2R-JOINT-CL6
	φ6 Long elbow type	4G2R-JOINT-CLL6
	φ8 Short elbow type	4G2R-JOINT-CL8
	φ8 Long elbow type	4G2R-JOINT-CLL8
	Plug cartridge	4G2R-JOINT-CPG
4G3 R	φ6 straight type	4G3R-JOINT-C6
	φ8 straight type	4G3R-JOINT-C8
	φ10 straight type	4G3R-JOINT-C10
	φ8 Short elbow type	4G3R-JOINT-CL8
	φ8 Long elbow type	4G3R-JOINT-CLL8
	φ10 Short elbow type	4G3R-JOINT-CL10
	φ10 Long elbow type	4G3R-JOINT-CLL10
	Plug cartridge	4G3R-JOINT-CPG

3) Mounting plate (P) kit

Model no.	Kit model no.	Set parts
3G1 R･4G1 R	4G1R-MOUNT-PLATE-KIT	Mounting plate, set screw 2, nut 2
3G2 R･4G2 R	4G2R-MOUNT-PLATE-KIT	Mounting plate, set screw 2
3G3 R･4G3 R	4G3R-MOUNT-PLATE-KIT	Mounting plate, set screw 2

4) Fitting stopper plate kit

Model no.	Kit model no.	Set parts
M4G1 R	4G1R-JNT-STP-PLATE-KIT	Joint stopper plate, set screw 2
M4G2 R	4G2R-JNT-STP-PLATE-KIT	Joint stopper plate, set screw 2
M4G3 R	4G3R-JNT-STP-PLATE-KIT	Joint stopper plate, set screw 2

5) Plate kit

Model no.	Kit model no.	Set parts
3GB1 R･4GB1 R	4G1R-PLATE-KIT	Plate, gasket, set screw 2
3GB2 R･4GB2 R	4G2R-PLATE-KIT	Plate, gasket, set screw 2
4GB3 R	4G3R-PLATE-KIT	Plate, gasket, set screw 2

Refer to catalog for details.

6) Fitting adaptor kit

4G[1]R－JNT－ADAPTOR－KIT－[C4][NC]－[F]

Model no.	Port size	Kit model no.	Set parts
3GA1 R･4GA1 R	C4	4G1R-JNT-ADAPTOR-KIT-C4[Note1]-[Note2]	Fitting adaptor, gasket, set screw 2
	C6	4G1R-JNT-ADAPTOR-KIT-C6[Note1]-[Note2]	
3GA2 R･4GA2 R	C4	4G2R-JNT-ADAPTOR-KIT-C4[Note1]-[Note2]	
	C6	4G2R-JNT-ADAPTOR-KIT-C6[Note1]-[Note2]	
	C8	4G2R-JNT-ADAPTOR-KIT-C8[Note1]-[Note2]	
3GA3 R･4GA3 R	C6	4G3R-JNT-ADAPTOR-KIT-C6[Note1]-[Note2]	
	C8	4G3R-JNT-ADAPTOR-KIT-C8[Note1]-[Note2]	
	C10	4G3R-JNT-ADAPTOR-KIT-C10[Note1]-[Note2]	

Note 1･･･ NC：For 3GA□10,NO：For 3GA□110, Blank：For besides 3GA□10･3GA□110

Note 2･･･ F：A/B port filter integrated, Blank ： Without A/B port filter (standard)

7) Female screw adaptor kit

4G[1]R－FML－ADAPTOR－KIT－[M5]－[F]

Model no.	Kit model no.	Set parts
3GA1 R･4GA1 R	4G1R-FML-ADAPTOR-KIT-[Port size]-[Note1]	Female screw adaptor, gasket, set screw 2
3GA2 R･4GA2 R	4G2R-FML-ADAPTOR-KIT-[Port size]-[Note1]	Female screw adaptor, gasket, set screw 2
3GA3 R･4GA3 R	4G3R-FML-ADAPTOR-KIT-[Port size]-[Note1]	Female screw adaptor, gasket, set screw 2

Note 1･･･ F：A/B port filter integrated, Blank ： Without A/B port filter (standard)

8) Masking plate kit

Model no.	Kit model no.	Set parts
M3G1 R･M4G1 R	4G1R-MP	Masking plate, gasket 1, set screws 2
M3G2 R･M4G2 R	4G2R-MP	Masking plate, gasket 1, set screws 2
M3G3 R･M4G3 R	4G3R-MP	Masking plate, gasket 1, set screws 2, PR check valves 2

9) DIN rail

Model no.	Description
N4GR-BAA [Note1]	DIN rail

Note1･･･ Rail length

L1: Manifold length		L2: Rail length	A: Mounting pitch
35	47.5 or less	87.5	75
Over 47.5 to 60		100	87.5
60	72.5	112.5	100
72.5	85	125	112.5
85	97.5	137.5	125
97.5	110	150	137.5
110	122.5	162.5	150
122.5	135	175	162.5
135	147.5	187.5	175
147.5	160	200	187.5
160	172.5	212.5	200
172.5	185	225	212.5
185	197.5	237.5	225
197.5	210	250	237.5
210	222.5	262.5	250
222.5	235	275	262.5
235	247.5	287.5	275
247.5	260	300	287.5
260	272.5	312.5	300
272.5	285	325	312.5
285	297.5	337.5	325
297.5	310	350	337.5
310	322.5	362.5	350
322.5	335	375	362.5
335	347.5	387.5	375
347.5	360	400	387.5
360	372.5	412.5	400
372.5	385	425	412.5
385	397.5	437.5	425
397.5	410	450	437.5
410	422.5	462.5	450
422.5	435	475	462.5
435	447.5	487.5	475
447.5	460	500	487.5
460	472.5	512.5	500
472.5	485	525	512.5
485	497.5	537.5	525
497.5	510	550	537.5

If the manifold length exceeds 510, calculate the rail length using a multiple of 12.5.

Refer to catalog for details.

10) Gasket kit

Model no.	Kit model no.
3G1･4G1 R	4G1R-GASKET
3G1･4G1 R (For masking plete)	4G1R-MP-GASKET
3G2･4G2 R	4G2R-GASKET
3G2･4G2 R (For masking plete)	4G2R-MP-GASKET
3G3･4G3 R	4G3R-GASKET

11) Gasket with check valve

Model no.	Kit model no.
3G1･4G1 R	4G1R-CHECK-VALVE
3G2･4G2 R	4G2R-CHECK-VALVE
3G3･4G3 R	4G3R-CHECK-VALVE

12) PR check valve kit (2 per set)

Model no.	Kit model no.
3G1･4G1 R	4G1R-PR
3G2･4G2 R	4G2R-PR
3G3･4G3 R	4G3R-PR

13) Set screw (10 per set)

Model no.	Kit model no.
3G1･4G1 R	4G1R-SET-SCREW
3G2･4G2 R	4G2R-SET-SCREW
3G3･4G3 R	4G3R-SET-SCREW
3GA3･4GA3 R (for 08 port size)	4G3R-SET-SCREW-L

14) DIN rail kit

Model no.	Kit model no.	Set parts
M4G1 R	4GA1R-BAA [Note1]-D	DIN rail, set screw 2, lock nut 2
	4GB1R-BAA [Note1]-D	
M4G2 R	4GA2R-BAA [Note1]-D	DIN rail/holder 2, tapping screw 2, set screw 4
	4GB2R-BAA [Note1]-D	
M4G3 R	4GA3R-BAA [Note1]-D	
	4GB3R-BAA [Note1]-D	

Note 1･･･Rail length

Refer to catalog for details.