CKD

2021.03.31
D3-354006-A 4

Handling Instructions

4G series

Discrete valve
Individual wiring manifold

Thank you for purchasing CKD product.
Please review the precautions in this Instructions thoroughly for safe operation of this equipment.

Keep this document in a safe location so that it is easily referenced as necessary.
For further information, refer to the instruction manual and product catalog.

CAUTION!! Do not remove the solenoid valve's packing until just before piping.

Foreign matter could enter the solenoid valve from the piping port and could lead to faults or malfunctions.

⚠ WARNING

■ Do not step on or place objects on the product. Failure to follow this warning may cause falling accident, falling of the product, bodily injury due to fall, malfunction due to breakage of the product, etc.

■ Before inspecting, checking or adjusting the product, turn off power supply and shut down compressed air line and verify zero residual pressure.

Installation

⚠ WARNING

■ Do not support valves with piping when installing valves.
Install and fix the valve body.

■Be sure to tighten the screws with appropriate torque.
Otherwise, air leakage, falling of product, damage to screws, deformation of DIN rail, etc. may occur.

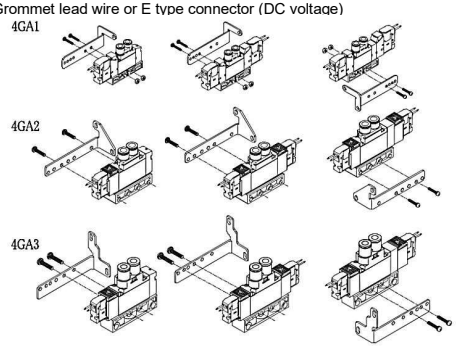
■ Avoid washing with water or solvents or painting.
Resin parts could be damaged.
The paint could block the pilot exhaust port and cause malfunction.

■ Do not restrict the valve's exhaust port (including pilot exhaust port) to less than the piping connection port size.
A breathing action is generated by valve operation at the valve's exhaust port, and foreign matter from around the exhaust port could be sucked in. If the exhaust port is installed facing upward, foreign matter could enter.
Install a silencer or pipe the exhaust port so it faces downward.

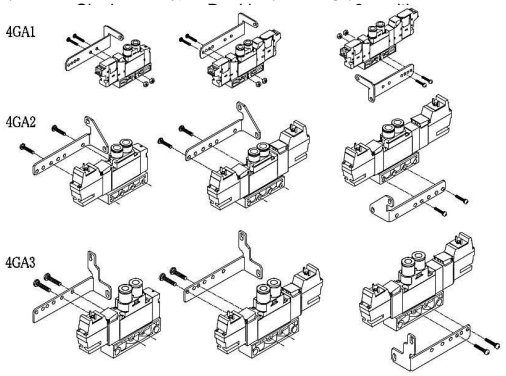
<How to install body porting discrete valve>

■When installation with mounting plate (P)
For mounting plate (P) of body porting discrete valve, installation method may differ depending on single, double or 3-position. Incorrect installation may cause failures.

i) Grommet lead wire or E type connector (DC voltage)



ii) DIN terminal box or E type connector (AC voltage)



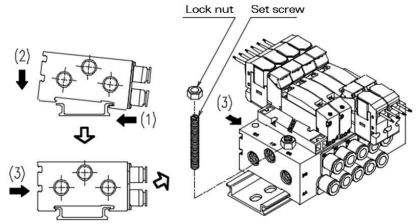
<How to install manifold>

■For direct installation
Secure the unit by tightening 4 screws passing through respective mounting hole.

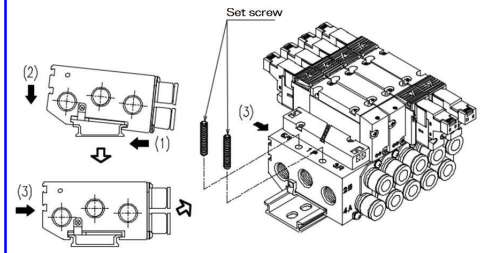
■Installing with DIN rail
If the manifold weights more than 1kg, or when using in an environment with vibration or impact, fix the DIN rail onto the surface at 50 to 100 mm spacing, and confirm that there is no problem with installation before starting operation.

[M4G1 series]
Mounting
1. Set the jaws onto the DIN rail in the order of (1) and (2).
2. Press in the direction of (3).
3. Tighten the set screws. (Tightening torque:0.3-0.5 N·m.)
4. Tighten the lock nut.

■ Be sure to secure screw with the lock nut.

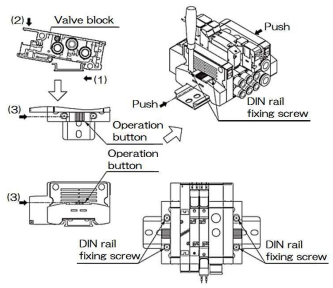


[M4G2/3 series]
Mounting
1. Set the jaws onto the DIN rail in the order of (1) and (2).
2. Press in the direction of (3).
3. Tighten the set screw. (Tightening torque:0.7-1.0 N·m.)



[MN4G series]
Mounting
1. Engage the pawl in DIN rail in the order of (1) and (2).
2. Push the operation button in the direction of (3).
3. While holding it to minimize gap between blocks, fasten the DIN rail fixing screws. (Recommended torque:1.2-1.6 N·m.)

■ Verify positive engagement of retainer pawl. Otherwise, air leakage or falling of product may occur.



Piping

⚠ CAUTION

■ When connecting pipes, wrap sealing tape in the opposite direction from threads starting 2 mm margin from the end of piping threads.
If sealing tape protrudes from pipe threads, it could be cut when screwed in. This could cause the tape to enter the solenoid valve and lead to faults.

■ Always flush just before piping pneumatic component.
Any foreign matter that has entered during piping must be removed so it does not enter the pneumatic component.

■ Tighten pipes with the appropriate torque.
Pipes must be connected with the appropriate torque to prevent air leakages and screw damage.

Tightening torque

Thread size	Tightening torque N·m	Thread size	Tightening torque N·m
M3	0.3～0.6	Rc3/8	13～15
M5	1.0～1.5	Rc1/2	16～18
Rc1/8	3～5	Rc3/4	19～40
Rc1/4	6～8	Rc 1	41～70

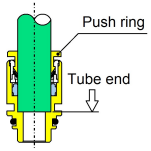
■ Check the location of piping port by referring to product indication, etc. Wrong piping will cause malfunctioning of actuator.

■ Do not throttle the supply port. Otherwise, supply pressure drops during operation and causes the device to malfunction.

■Securely insert the tube to the tube end, and make sure that the tube cannot be pulled off.

■Cut the tube at right angles using a dedicated cutting tool.

■The bending angle of piping must be larger than the minimum bend radius of the tube.



Minimum bend radius of tubing

Tube diameter mm	Minimum bending radius mm	
	Nylon	Urethane
φ4	10	10
φ6	20	20
φ8	30	30
φ10	40	40
φ12	55	50

Lubrication

⚠ CAUTION

■ This product is basically an oilless type, requiring no lubrication. However, it can accept class 1 turbine oil (additive-free), ISO VG32.

■ Once the oil is applied to the product, continuous application is required. Loss of oil means loss of lubricant, causing malfunctioning.

Manual override

⚠ WARNING

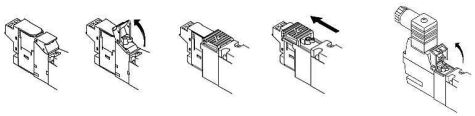
■Even if the manual override is operated, the main valve does not switchover until air is supplied to the supply port on the internal pilot type, or to the external pilot supply port on the external pilot type.

■Manual override protective cover is provided as standard. The manual override protective cover is closed when the valve is shipped to protect manual override, which cannot be seen when delivered. Open the protective cover and operate manual override.
Note that the protective cover does not close unless the manual override lock is released.

■Manual override is used for both non-locking and locking. The lock is applied by pressing down and turning manual override. When locking, press down and turn.
If manual override is turned without being pressed down, it could be damaged or air could leak.

■Opening and closing the manual protective cover
Do not excessively force the manual protective cover when opening and closing it. Excessive force could cause faults. (Less than 5N)

4G1 Series　4G2/3 Series　4G2/3 Series/Din terminal box

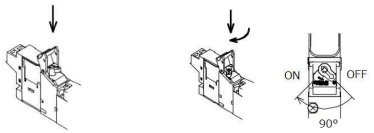


Turn type　Slide type　Turn type

■How to operate manual override

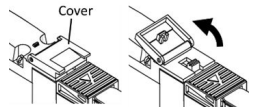
• For non-locking manual override
Push it to arrow direction until it stops.
Manual override is unlocked when released.

• For locking manual override
Push manual override and turn 90° in the direction of the arrow.
Manual override is not unlocked even when released.

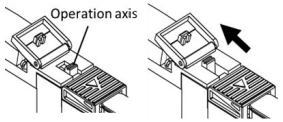


＜In the case of the device which release residual pressure＞

■Opening and closing the cover.
Do not excessively force the cover when opening and closing it. Excessive force could cause faults. (Less than 5N)



■Operating method of The device which release residual pressure.
When you release residual pressure, please push the operation axis in the arrow direction.
The device of non-lock type which release residual pressure is unlocked when released.
The device of lock type which release residual pressure is not unlocked even when released.(Please be careful to forget to go back up.)



⚠ WARNING

■ After operating the solenoid valve's manual operation device, return it to the origin (initial position) before operating the device. When operating in the operation position using the manual peration device, abnormal operation could occur, causing a hazard.
■ When conducting manual operations, make sure that there are no people near the moving cylinder.

Connecting electric wire

General precautions on electric wire connection

⚠ WARNING

■ Turn power OFF before attempting wiring work. There is a risk of electric shock.

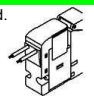
Energization for a long time

■ Energizing for a long time could impair solenoid valve performance. Similar caution is required in the following use.
・During intermittent energizing, it takes longer than non-energizing.
・During intermittent energizing, one energizing session exceeds 30 min.
Consider heat disspation when installing.
Consult with CKD if energizing for a long time.

Specific precautions

Grommet lead wire

■ Lead wire AWG#26 OD φ1.3 is used.

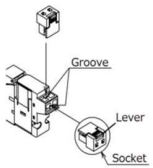


E type connector

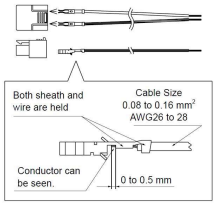
■ The E type connector is a top/side common connector to which the sockets can be connected to either the top or side directions. Select the connection direction based on installation.

How to mount/dismount socket

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

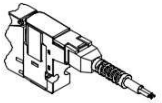


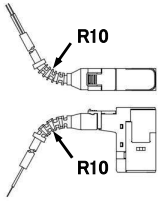
(2) When removing the socket, press down the lever to release jaws from the groove, then pull straight out.
■ The socket assembly has lead wire of AWG #26-28(0.08～0.16mm²)



EJ type connector

■ Do not bend the lead wire to the degree of flexion shown right.
[Lead wire AWG#24 φ1.1]

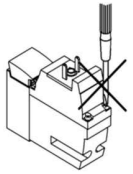




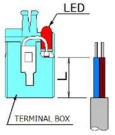
DIN terminal box

⚠ CAUTION

■ Use the specified DIN terminal box.
■ Do not loosen coil assembly fixing screws. Loose fixing screws reduce strength of protective construction. (See figure right.)
■ To achieve protective construction IP65, heed these precautions:
(1) Use appropriate cable.
VCTF 2(3)-conductor (φ3.5 - φ7.0) according to JIS C 3306
(2) Secure the terminal box assembly with appropriate torque: 0.4-0.45 N·m.
(3) Screw the cable gland to a position so that rubber packing positively holds cable external surface.
Cable gland tightening torque: 1.0-1.5 N·m.
(4) Do not exert an excessive force on the screw terminal to remove it from the cover.



■ Do not strip more than 10 mm sheath off the cable. Longer sheath will reduce water resistance of the cable.
The length of sheath to be removed will be equal to the length of L on the screw terminal. (See figure right.)

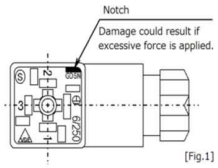


■ Do not subject the box to shock or heavy object.

■Other Cautions
Ground terminal is provided for AC voltage unit. Ground terminal is not provided for DC voltage unit.

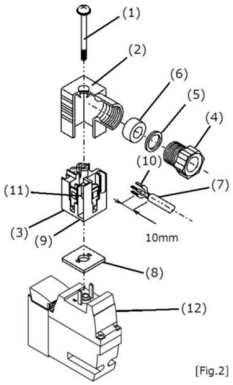
1. Disassembling

1) Loosen the screw (1), and pull the cover (2) in the direction of screw (1). The connector will come off the coil assembly (12).
2) Pull the screw (1) out of the cover (2).
3) There is a notch (9) (next to GDSN mark) on the bottom of the terminal block (3). Insert a small flat-tip screwdriver between the housing (2) and terminal block (3), and twist it. The terminal block (3) will come off the cover (2). (Refer to Fig.1). Take care not to apply excessive force as there is a risk of damage.



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

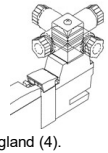
2. Wiring



[Fig.2]

●Wiring preparation
・The cable (7) applicable outline dimensions are VCTF2 (3) core（Ø3.5 to 7) specified in JISC3306.
・Strip 10 mm of the cable's lead sheath.
・Either twisted wires or single wire can be connected.
・When using twisted wires, avoid connecting soldered wires.
・When using a crimping sleeve 10 on the end of the twisted wire, use the Japan Weidmuller H0.5/6 (0.3 to 0.5 mm²), H0.75/6 (0.75 mm²) or equivalent prduct. The crimping sleeve must be prepared by the user.
●Wiring
1)Pass the cable gland (4), washer (5) and rubber packing (6) in order through the cable (7), and insert into cover (2).
2)Connect to terminals 1 and 2. There is no polarity.
・Recommended tightning torque is 0.2 to 0.25 N.m.

3. Assembly



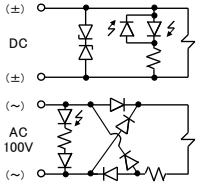
●Set the connected terminal block (3) into the cover (2). (Press in until a click is heard.)
・The terminal block can be set in four directions.(Refer to Fig.3)
●Set the rubber packaging (6) and washer (5) in order into the cover (2) cable lead-in port, and then securely tighten the cable gland (4).
Remarks: The reference tightening torque for the cable gland is 1.0 to 1.5 N.m. Check that the cable cannot be pulled off.
●Make sure gasket (8) is inserted in the plug on coil assembly (12), and then insert the connector. Insert screw (1) from the top of cover (2) and tighten it.
Remarks: Recommended tightening torque of a screw is 0.4 to 0.45 N.m.

Electrical connection diagram

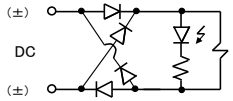
N: Without lead wire
L: With lead wire
S: With surge suppressor
Lm: With lamp
Ns: Without socket, without terminal box

Grommet lead wire
Blank

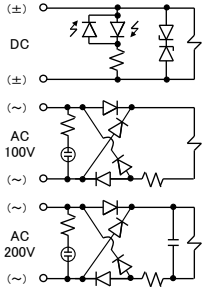
E type connector
E2 : L,Lm,S
E2N : Lm,S,Ns



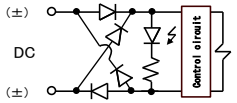
E type connector
(Opution S：surge less type)
E2 : L,Lm,S
E2N : Lm,S,Ns



DIN terminal box
B : N, Lm, S
BN : N,Lm,S,Ns



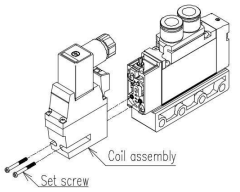
E type connector
(Opution S：Low exoergic/energy saving circuit type)
E2 : L,Lm,S
E2N : Lm,S,Ns



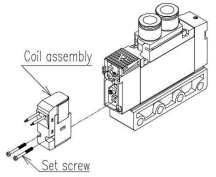
How to replace coil, How to replace solenoid valve

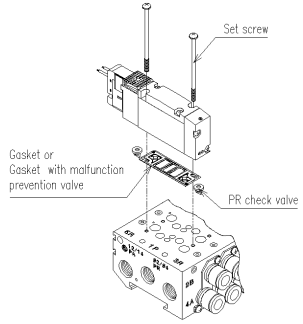
Replace by removing the set screw shown below. Loosening the other screws could cause operation faults. When installing, check the installation of the gasket on the coil assembly side for coil assembly, the gasket or gasket with malfunction prevention valve for the solenoid valve, and the PR check valve, and pay attention to the tightening torque.
Improper installation could result in air leaks or operation faults.
Tightening torque
・Coil assembly : 0.14-0.18 [N·m]
・4G1 : 0.19-0.21 [N·m]
・4G2 : 0.35-0.40 [N·m]
・4G3 : 0.55-0.65 [N·m]
Notice:The grommet lead, E type connector specification and DIN terminal box specification coil assembly are not exchangeable.

i) DIN terminal box specification



ii) For other than DIN terminal box specifications





UL correspondence

■ When a model number end has "-UL", the product supports the following contents.

CCN : YIOZ2
File No. : MH47133

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