CKD

2017.2.13
D3-402687-A

Handling Instructions

Valve series with senser
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.

⚠ WANING

■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.

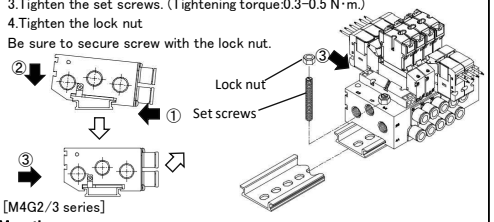
Installation

⚠ WANING

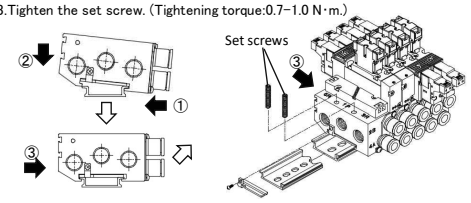
■Do not support valves with piping when installing valves.
Install and fix the valve body.
■Be sure to tighten the screws with appropriate torque.
Otherwise, air leakage, falling of product, damage to screws, deformation of DIN rail, etc. may occur.
■Avoid washing with water or solvents or painting.Resin parts could be amaged.
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.

＜**Mounting**＞
■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.

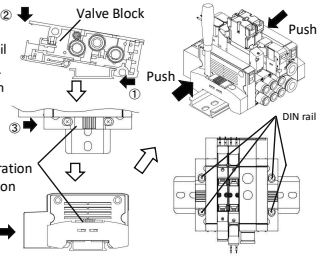
[[M4G1 series]
Mounting
1.Set the jaws onto the DIN rail in the order of ①and ②.
2.Press in the direction of ③.
3.Tighten the set screws. (Tightening torque:0.3-0.5 N･m.)
4.Tighten the lock nut
Be sure to secure screw with the lock nut.



[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.)



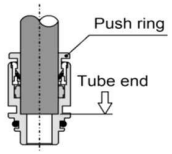
■Verify positive engagement of retainer pawl. Otherwise, air leakage or falling of product may occur.

⚠ 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	Rc1	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.

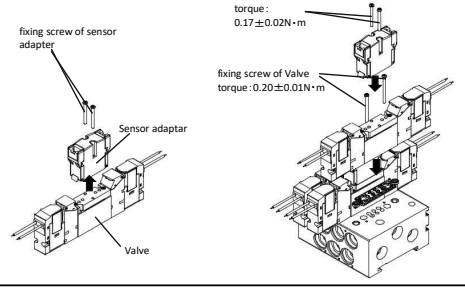


Minimum bend radius of tubing

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

Replacement of valve

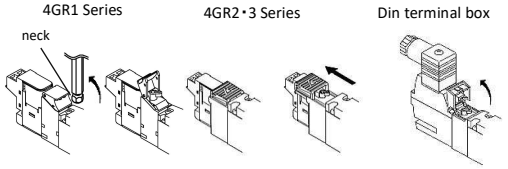
In the case of the exchange of 4G1R series valve, please remove a sensor adapter once.
I attach a valve with fixing screw, and, please attach a sensor adapter again.



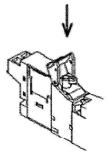
⚠WARNING

■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.

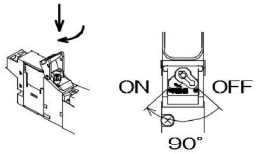
■Opening and closing the manual protective cover
Do not excessively force the manual protective cover when opening and closing it. Excessive force could cause faults. (Less than 5N)
The Openning manual protective cover of the 4GR1 type, please open a cover using the constriction point of the ball point hexagon wrench. (Please use the wrench size in 2.5-4)



■How to operate manual overrid
･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.



⚠ 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 operation 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

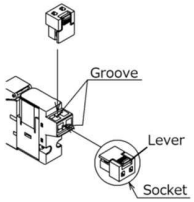
■Lead wire AWG#26 OD φ1.3 is used.

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

①When 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.

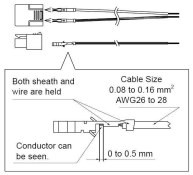


②When removing the socket, press down the lever to release jaws from the groove, then pull straight out.

■The socket assembly has lead wire of AWG #26-28(0.08～0.16㎟)

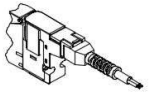
■Wiring of lead wires

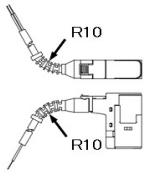
①Strip the sheath approx. 3 mm from the top end of the lead wire and align the top ends of the conductors and insert them into the contact terminal. Crimp the contact terminal with the crimp tool. When crimping, pay special attention so that the sheath sheath and conductors are held firmly, and 0 to 0.5 mm of conductor top can be observed.
②After 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.



EJ type connector

■Do not bend the lead wire to the degree of flexion shown right.
[Lead wire AWG#25 φ1.14]

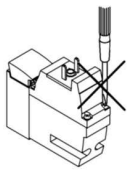


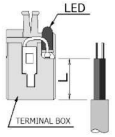


DIN terminal box

⚠ 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: 0.2-0.25 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.



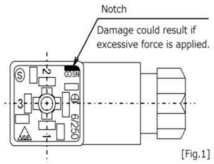


■Other Cautions

Ground terminal is provided for AC voltage unit. Ground terminal is not provided for DC voltage unit.

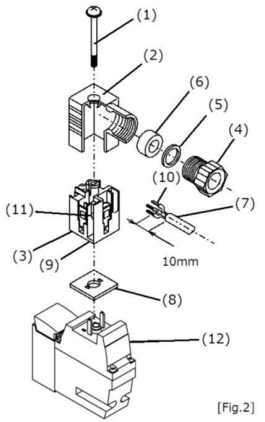
■Disassembling

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.



[Fig.1]

2 Wiring



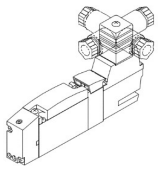
[Fig.2]

●Wiring preparation
・The cable (7) applicable outline dimensions are VCTF2 (3) core (Ø 3.5 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 mm^2), H0.75/6 (0.75 mm^2) 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.



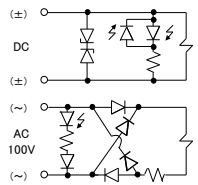
●Make sure gasket (8) is inserted in the plug on coil assembly (12), and then insert the connector. Insert screw (1) from the top of cover (2) and tighten it.
Remarks: Recommended tightening torque of a screw is 0.2 to 0.25 N.m.

Electrical connection diagram

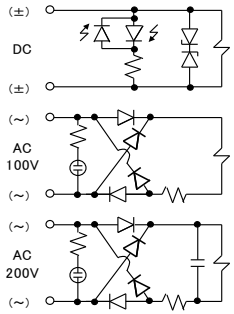
N: Without lead wire
L: With lead wire
S: With surge suppressor
Lm: With lamp
Ns: Without socket, without terminal box

Grommet lead wire
Blank

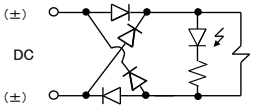
E type connector
E2 : L,Lm,S
E2N : Lm,S,Ns



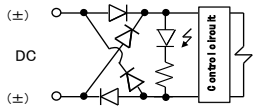
DIN terminal box
B : N, Lm, S
BN : N,Lm,S,Ns



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



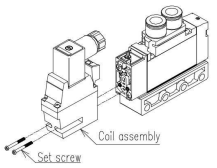
E type connector (Opution S:Low exoergic/energy saving circuit type)
E2 : L,Lm,S
E2N : Lm,S,Ns



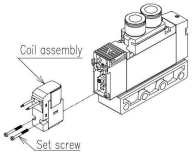
How to replace coil

Replace the coil by removing the set screw shown below. Loosening the other screws could cause operation faults. When installing, check that the gasket is installed on the coil side, and note tightening torque. Improper installation could result in air leaks or operation faults.
Tightening torque:0.14-0.18 N·m
Notice:The grommet lead, E type connector specification and DIN terminal box specification coil assembly cannot be replaced.

i) DIN terminal box



ii)Coil not conforming to DIN terminal box specification



Pressure Sensor

⚠ Caution

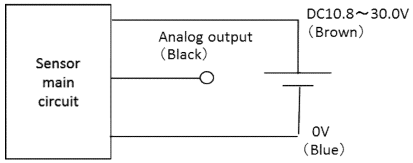
■This product is designed for air and compressed dry air. Do not use it with corrosive and combustible gases.

■Do not touch electric eiring connections (exposed live parts):this will cause an electric shock. During wiring keep the power off. Also,do not touch these live parts with wet hands.

Caution of Handling The Product
①Please do not apply other media than "indicated"applicable media.In case other media is used, we are not in a position to guarantee the performance of the product and assure the safety.Please never apply corrosive gases,infiammable gases,oxygen etc.
②Do not disassemble this product.If the product is disassembled, apart may be ejected when pressure is applied.
③Connection area between the body and the joint can be rotated. Do net rotate it repeatedly
④Please do not pull a lead with excessive stress.In addition, please do not use stress in the state that you took.It becomes poor in a leak and connection.

Internal circuits and wiring

Identification color	Connection to
Brown	Poewr source DC10.8～30.0V
Black	Analog output (1～5V)
Blue	0V (GND)



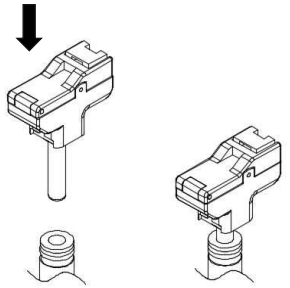
Caution
・Wiring
Please be sure that the wiring works are done after the electrical supply was cut Before and during the wiring works charged static electricity on body or ontolls should be discharged. for moving part,flexible cables should be used.
・Wiring Installation
This products and wiring should be installed as much away as possible from those noise source like strong electric cables. Also please take measures for surge transferred to power source cable.
・Power voltage
Do not use this component with higher voltage than specified. If voltage exceeds the specification or alternative current (AC100V)is applied, the equipment may be damaged or burned.
・Short-circuiting
Do not short-circuit the wiring,otherwise, damage ot burning may occur.
・Incorrect wiring
Connect wires to the correct poles or terminals. otherwise,wires may be damaged or burned
・Load
The output impedance of analog output part is 10Ω. In case of using load,Please assume load resistance more than 10kΩ.

Out impedance of pressur sensor: R_0=10Ω
Load intemal impedance: R_X=10kΩ

$$Output\quad value = \left(1-\frac{R_0}{R_0+R_X}\right)\times 100\% = \left(1-\frac{10\Omega}{10\Omega+1k\Omega}\right)\times 100\%$$

➡ The error of output value approx.0.01%

■Piping (Type mounted with one sensor)
Plug part should be inserted firmly and before use, plug should be checked that it is not inserted to the end, plug can be come out and leakage may happen



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