CKD

2021.03.31
D3-354007-A 3

Handling Instructions

4G series

Fewer wiring type 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.

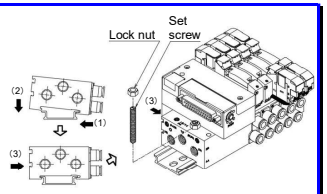
<How to install manifold>

- 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.

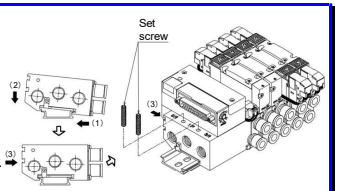


- Be sure to secure screw with the lock nut.

[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.)

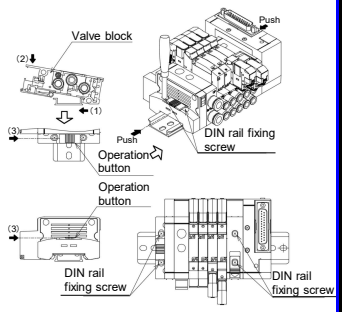


[MN4G series]

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

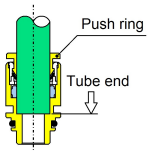
⚠ CAUTION

- 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.

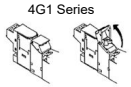
Manual override

⚠ WARNING

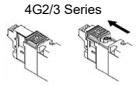
- Even if the manual override is operated, the main valve does not switchover until air is supplied to the supply port on the internal pilot type, or to the external pilot supply port on the external pilot type.
- Manual override protective cover is provided as standard. The manual override protective 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.
- Be sure to unlock the residual pressure discharge lock type before normal operation as it may cause malfunction.
- When conducting manual operations, make sure that there are no people near the operating cylinder.

- 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



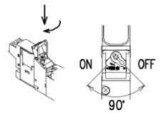
4G2/3 Series



- How to operate manual override

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

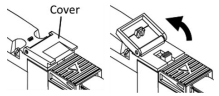
• For locking manual override
Push manual override and turn 90° in the direction of the arrow.
Manual override is not unlocked even when released.



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

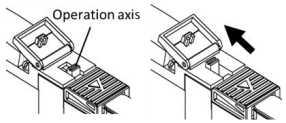
- Opening and closing the cover.

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.)



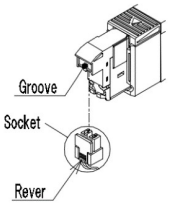
Connecting electric wire

The A type connector is a reduced wiring connector, allowing engagement of socket from downside.

Engagement/disengagement of socket

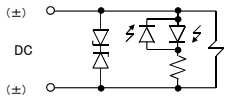
① To engage the socket, hold it and lever with fingers and insert it to the square opening of the connector. Engage the detent on lever to groove of the connector to lock.
② To disengage the socket, first disengage the detent of lever from the groove by pressing lever, and then pull the socket straight downward.

- The socket assembly uses lead wire of AWG #28, OD ϕ0.88.

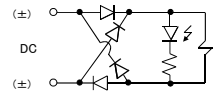


Electric wire connection diagram

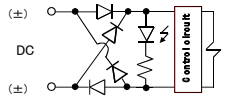
A type connector



A type connector
(Opution S：surge less type)



A type connector (Opution S：Low exoergic/energy saving circuit type)



How to replace coil, How to replace solenoid valve

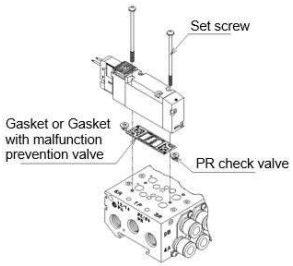
Replace by removing the set screw shown below. Loosening the other screws could cause operation faults. When installing, check the installation of the gasket on the coil assembly side for coil assembly, the gasket or gasket with malfunction prevention valve for the solenoid valve and the PR check valve, and pay attention to the tightening torque.

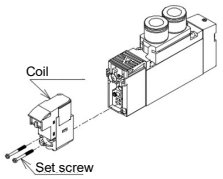
Improper installation could result in air leaks or operation faults.

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.





CKD Corporation

Wiring system

General precautions

⚠ WARNING

- Be sure to turn off power before starting wiring work.
  Never touch live terminal, and never bring wet hand close to the terminal. Electric shock may occur.

⚠ CAUTION

- Identify the voltage of available source
- Simultaneous feeding of many loads causes voltage drop, in proportion to cable length. Make sure that the voltage drop across solenoid is 10% or less the rated voltage.

Cautions on individual wiring systems

One end port type [T10/T11]

- On the one end port type, common lines are internally connected. For independent contact type PLC output unit, run the common line through the contact area.

[T10]

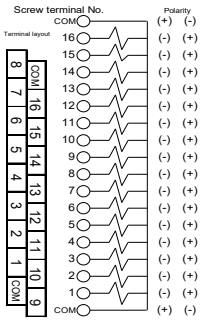
- For wire connection, use Y terminal or ring terminal. Use crimping terminal of 6.2 wide for M3. Fastening torque should be 0.6 N·m. Direct connection of lead wires results in breakage and loose connection, causing malfunction of solenoid valve.

[T11]

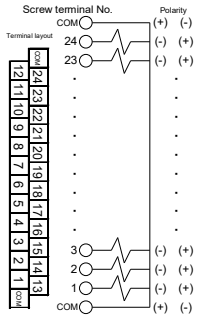
- For connection, use 0.128-0.81 mm² stranded wire or φ0.4-1.0 single wire. Peel off insulation 5-7 mm from the wire. Tighten wiring screw with 0.3 N·m torque.

Internal circuit diagram

[T10]



[T11]

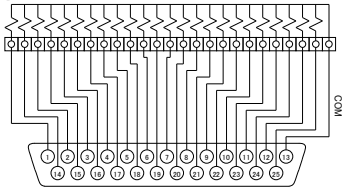


D-sub connector type [T30]

- Signal assignment on PLC output unit must correspond to that on valve side.

Internal circuit diagram

[T30]



Flat cable type [T50/T51/T52/T53]

⚠ CAUTION

- Connect the product to the output unit. Do not connect it to input unit. Possible consequences: equipment damage not only to the product but also to the peripheral equipments.
- When supplying power from external source, check the polarities. Wrong polarity connection will result in fuse blowing.

- Signal assignment on PLC output unit must correspond to that on valve side.
  The number of directly connectable PLCs is limited. For these direct connections, use the connection cable that meets the specification of that PLC.
  Although numbering system of pin is different from PLC to PLC, functions of these pins are common to all brands.
  The pins on both plug and socket should be arranged with reference to the triangular mark (▼) of the connector.

[T50]

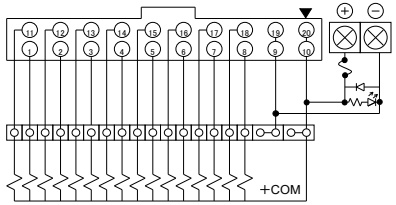
- When driving from a general output unit, use positive terminals (20, 10) on 20P connector as common positive (+) line. Use open collector NPN transistor as the driver.
- Connect power to the screw terminal only when external power source is required.
  Use crimping terminal of up to 6.4 wide for M3. Fastening torque should be 0.3-0.5 N·m.

[T51/52/53]

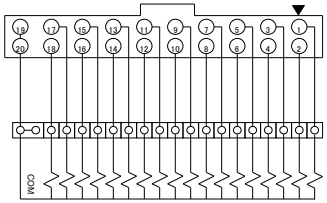
- On the manifold, common line is prewired. Since the solenoid valve is not polarity sensitive, DC output of PLC can be connected to the output of NPN or PNP transistor.

Internal circuit diagram

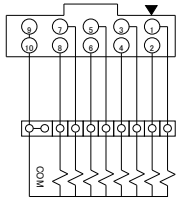
[T50]



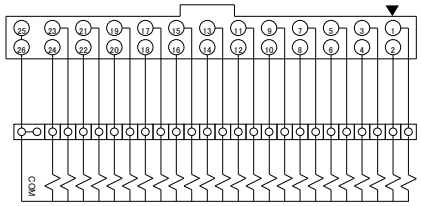
[T51]



[T52]



[T53]



Serial transmission type [T6*/T7*/T8*]

Refer to the handling instructions and catalogs prepared separately.

Relationship between connector pin numbers

Setting connector pin number

Numbers in the wiring diagrams left represent connector pin numbers (screw terminal numbers) assigned by CKD for reference.

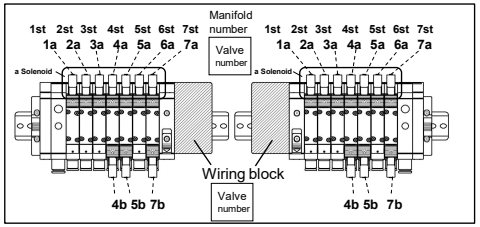
Setting valve numbers

- Assign manifold numbers starting with leftmost one, with solenoid a-side in the back.
- Valve Nos. 1, 2,,,, represent 1st, 2nd,,,, and a, b,,,, represent solenoid a, solenoid b, etc.

Therefore, on the manifolds shown right, valve numbers are identical regardless of position of wiring block.

Standard wiring (ascending order) and optional (W) (double wiring) are described below.

For other wiring methods, see separate wiring specifications.



The figure above shows MN4GB2.

Standard wiring

Connect wires in the ascending order starting with No.1 pin, as shown below, without leaving any terminal unused.

Standard wiring table

T10

Screw terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Single solenoids only	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b
Example drawing (mixed)	1a	2a	3a	4a	4b	5a	5b	6a	7a	7b	Unused	Unused	Unused	Unused	Unused	Unused

T11

Screw terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Single solenoids only	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a	17a	18a	19a	20a	21a	22a	23a	24a
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b
Example drawing (mixed)	1a	2a	3a	4a	4b	5a	5b	6a	7a	7b	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused

T30

Connector pin No.	1	14	2	15	3	16	4	17	5	18	6	19	7	20	8	21	9	22	10	23	11	24	12	25	13
Single solenoids only	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a	17a	18a	19a	20a	21a	22a	23a	24a	COM
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b	COM
Example drawing (mixed)	1a	2a	3a	4a	4b	5a	5b	6a	7a	7b	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	COM

T50

Connector pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Single solenoids only	1a	2a	3a	4a	5a	6a	7a	8a	-	+COM	9a	10a	11a	12a	13a	14a	15a	16a	-	+COM
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	-	+COM	5a	5b	6a	6b	7a	7b	8a	8b	-	+COM
Example drawing (mixed)	1a	2a	3a	4a	4b	5a	5b	6a	-	+COM	7a	7b	Unused	Unused	Unused	Unused	Unused	Unused	-	+COM

T51

Connector pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Single solenoids only	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a	17a	18a	COM	COM
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	COM	COM
Example drawing (mixed)	1a	2a	3a	4a	4b	5a	5b	6a	7a	7b	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	COM	COM

T52

Connector pin No.	1	2	3	4	5	6	7	8	9	10
Single solenoids only	1a	2a	3a	4a	5a	6a	7a	8a	COM	COM
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	COM	COM
Example drawing (mixed)	1a	2a	3a	4a	4b	5a	5b	6a	COM	COM

(No. of polarities is not sufficient.)

T53

Connector pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Single solenoids only	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a	17a	18a	19a	20a	21a	22a	23a	24a	COM	COM
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b	COM	COM
Example drawing (mixed)	1a	2a	3a	4a	4b	5a	5b	6a	7a	7b	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	COM	COM

Double wiring (option symbol W、W1)

Double wiring corresponds to the wiring of double solenoid regardless of operator position of solenoid valves installed. Therefore, if all solenoids are double type and they use all control points, the wringing is compatible with standard wiring. If single solenoids are used, connector pins for b solenoid are not used. The below shows wiring for T53W as an example.

Double wiring table

T53W

Connector pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Single solenoids only	1a	Unused	2a	Unused	3a	Unused	4a	Unused	5a	Unused	6a	Unused	7a	Unused	8a	Unused	9a	Unused	10a	Unused	11a	Unused	12a	Unused	COM	COM
Double solenoids only	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b	COM	COM
Example drawing (mixed)	1a	Unused	2a	Unused	3a	Unused	4a	4b	5a	5b	6a	Unused	7a	7b	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	COM	COM

CKD Corporation

Head Office & Factory
2-250 Ouji, Komaki-city, Aichi, 485-8551 TEL (0568)77-1111 FAX (0568)75-3715
Sales Div.
2-250 Ouji, Komaki-city, Aichi, 485-8551 TEL (0568)74-1303 FAX (0568)77-3410

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