CKD D3-343680 2015.3.3

Handling Instructions

MN3E·MN4E-TM1C series

Thank you for purchasing CKD product.
Please review the precautions in this document 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 unpack solenoid valve until the piping is ready for connection.

Foreign particle entering through piping port will cause failure and malfunction.

⚠ 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.

Connection and installation

⚠ WARNING

- Do not use water or solvent for cleaning and painting. Plastic broken by the solvent and coating materials will clog the port, causing malfunction.
- Check the location of piping port by referring to product indication, etc. Wrong connection will cause malfunctioning of actuator.
- Screws used to fasten pipe joints must be tightened with a correct torque. Otherwise, air will leak or screws will be broken.

Tightening torque

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

⚠ CAUTION

- **Do not restrict the flow of air to the supply port.** Otherwise, supply pressure drops during operation and causes the device to malfunction.

- Before connecting the piping to the valve, thoroughly clean the inside of piping by air blowing (air flushing) or by washing to clear off chips, cutting oil, dust and foreign particle.
- When mounting the solenoid valve, do not employ a mounting method in which the solenoid valve is supported by piping. Make sure the solenoid valve itself is securely mounted.
- When wrapping a seal tape, start wrapping 2 mm from the tip of the threaded section, in the piping tightening direction. Do not let the tape protrude from the threaded section; it will be cut as the piping is screwed in, leaving shreds inside valve. These chips or shreds will result in failure.
- Prevent entry of contaminants through the exhaust port by positioning the exhaust port face down or by using a silencer.

Lubrication

⚠ CAUTION

- This product is basically a pre-lubricated type, requiring no lubrication. However, when lubrication is needed, it can accept class 1 turbine oil (no additions), ISO VG32. Remember that once the oil is applied to the product, continuous application is required. Loss of oil means loss of lubricant, causing malfunction.

Self-return

- There are self-return types for the solenoid positions of valve block. Self-return is performed either by "differential pressure return" or "differential pressure spring return".
- Under normal pressure, both types perform self-return in which the main valve returns to its origin (i.e., its normal position) when de-energized (OFF); but they perform differently when supply pressure becomes 0 while energized (ON).
  - "Differential pressure return" type holds the current position.
  - "Differential pressure spring return" type returns to origin with the aid of spring.

Choose the return type according to the interlock specification of the device to be used.

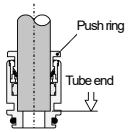
State of main valve - holding/returning

Valve type			Decrease in source pressure when ON	→ Source pressure restored	Disconnection of power supply when ON
N3E00 N3E0	1/11	3-port valve single NC/NO self-return type (differential pressure spring return)	Returns to OFF position (origin)	Returns to ON position	Returns to OFF position (origin)
	2/21	3-port valve double NC/NO self-hold type	Holds ON position		Holds ON position
	66/67/ 76/77	Two 3-port valve integrated type NC/NO self-return type (differential pressure return)	Holds ON position		Returns to OFF position (origin)
	66S/67S/ 76S/77S	Two 3-port valve integrated type NC/NO self-return type (differential pressure spring return)	Returns to OFF position (origin)	Returns to ON position	Returns to OFF position (origin)
N4E00 N4E0	1	4-port valve 2-position single solenoid self-return type (differential pressure spring return)	Returns to OFF position (origin)	Returns to ON position	Returns to OFF position (origin)
	2	4-port valve 2-position double solenoid self-hold type	Holds ON position		Holds ON position
	3/4/5 (only N4E0)	4-port valve 3-position	Returns to OFF position (origin)	Returns to ON position	Returns to OFF position (origin)

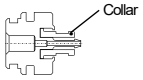
Joint and tube

Push-in joint

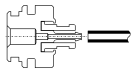
- Insert the tube to the tube end. Verify positive engagement of the tube by jiggling it. If the tube is not fully inserted, it may become loose, causing air leakage.



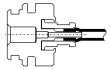
Operation of joint for Air Fiber (CF)



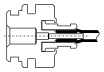
① Insert the collar until it stops.



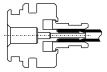
② Cut the tip of Air Fiber perpendicular to its length.



③ Insert Air Fiber through the collar properly.



④ Make sure to insert Air Fiber until it stops.



⑤ Pull the collar to lock.

Tube

- Use a dedicated cutter to cut the tube perpendicular to its length.
- The bending angle of piping must be larger than the minimum bend radius of the tube.

Manual operation

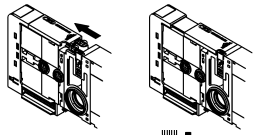
⚠ WARNING

- Be sure the area near the operating cylinder is cleared of all unauthorized personnel before working.
- Release the lock before starting normal operation to prevent false operation.

- The 4E series is a pilot operated solenoid valve. If air is not supplied to P port (PA port for external pilot), the main valve will not switch over even if manual operation is activated.
- Cover for protecting the manual operating device is provided as standard accessory. The unit is delivered with the cover closed. Open the cover to access the manual operating device.
  Note: The cover cannot be closed until the lock type manual operation is deactivated.
- The manual operating device allows both non-lock type operation and lock type operation. It locks when rotated while being pushed. Never rotate it without pushing it. Otherwise, breakage to the manual operating device or air leakage may occur.

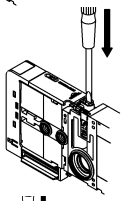
Opening/closing the cover for manual operation

- When opening/closing the cover, do not apply excessive force (i.e., 5N or more) which will cause malfunction.

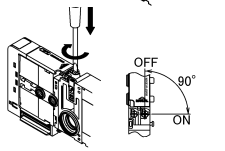


Operating the manual operating device

- Push/non-lock operation
  Push the device with a tool in the direction of arrow until it stops. Removing the tool deactivates the manual operation.



- Push/lock operation
  Push the device until it stops, and then rotate it 90 degrees in the direction of arrow. Removing the tool will not deactivate the manual operation.



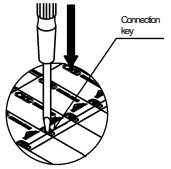
Disassembling/Assembling the manifold

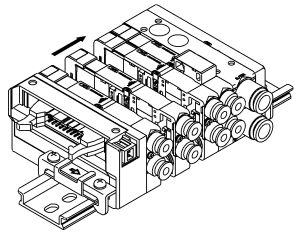
⚠ WARNING

- When adding/removing manifold, be sure to turn off power supply and release pressure from the system.
- Be sure to join the blocks. Tighten the screws with appropriate torque. Inappropriate assembling or tightening may cause air leakage, falling product, broken screws, deformed DIN rail, etc.

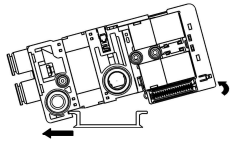
Disassembling

- Loosen DIN rail fixing screws on end block side.
- **Using a needle-nosed tool, press and hold the connection key** for the valve block to be replaced and the blocks on both sides.
- **While pressing and holding the connection key,** slide the block toward the end block to provide approx. 10 mm clearance on both sides of the block to be replaced.



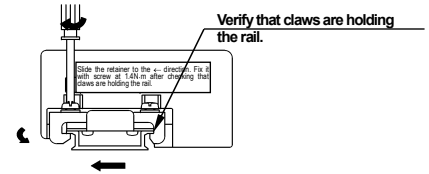


- Lift the electric component cover side of the block and pull it toward the piping port to remove it from DIN rail.



Assembling

- Slide all blocks toward the wiring block and **connect them so that no gap is found between blocks.**
- Verify that the connection key is returned to the groove on the block upper surface.
- **Slide the retainer of end block toward port until the claws catch the DIN rail** and tighten the fixing screws after checking that claws are holding the rail. Appropriate tightening torque is 1.4 N·m.



(Option) Power supply to individual wiring (D*)

⚠ CAUTION

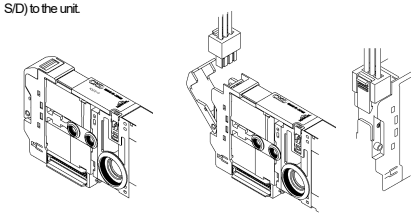
- Product containing only indicator light and surge suppressor can be operated with either plus or minus polarity.
- Product containing low heating, power-saving circuit can be connected only to plus common. Check polarity before connection.

(Option)Individual ON/OFF power input feature (AUX)

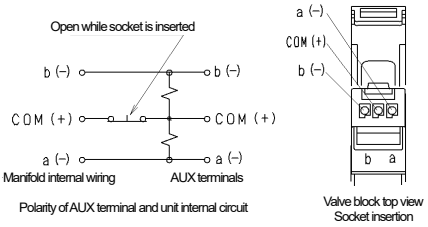
Individual ON/OFF power input feature (AUX) enables individual operation of any valve in the reduced wiring manifold by using a separate power source. This feature is useful when adjusting the device.

Connecting to individual power supply

Open the electric component cover. Connect the power input socket (N4E0 socket assembly S/D) to the unit.



When the power input socket is connected, valve internal wiring is temporarily disconnected from the reduced wiring on the manifold, enabling external power supply.



Polarity of AUX terminal and unit internal circuit

Valve block top view
Socket insertion

Precautions for use of AUX

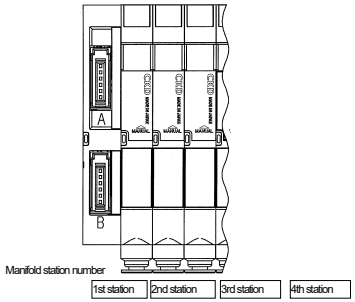
Reduced wiring side's and individual power input side's polarity is **plus common**. Verify the polarity of wiring before making connection.

Reduced wiring side and individual power input side must be connected to independent power supply. If they share the same power supply, the reduced wiring cannot be separated resulting in malfunction.

Please turn over

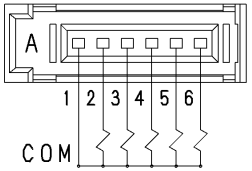
Intermediate wiring block type：TM1C wiring method

The manifold station number is 1, 2, 3, ... and so on starting from the intermediate wiring block.



Connector for TM1C wiring method

The connector for TM1C wiring method is the 6P RITS connector (1473562-6) made by Tyco Electronics Japan G.K. The connector is marked with pin numbers 1 to 6 and up to 5 input points can be assigned as shown below.



Cautions regarding the connector type (TM1C)

① The order of signals in the PLC output unit should match the order of signals in the solenoid valve system.
② Power supply voltage is only 24 or 12VDC.
③ With the TM1C type wiring, a general output unit should be used to drive the manifold.
④ Make sure to connect the manifold to the output unit. Never connect it to the input unit as a problem will involve not only this unit, but also other related equipment as well, seriously aggravating the situation.
⑤ Voltage drops will occur depending on cable lengths or at the time of simultaneous power supply. Make sure that a voltage drop for the solenoid is within 10% of the rated voltage.

TM1C connector pin array (example)

＊ The numbers in valve No. 1a, 2a, 2b,… indicate the station No.1, station No.2 and so on, while the alphabets a and b mean, respectively, the solenoid on the a-side and the solenoid on the b-side. Maximum station number depends on the model. Refer to the specifications of the model you selected.

Single solenoid valve only

<Standard wiring>

Pin No.	1	2	3	4	5	6
Valve No.	COM	1a	2a	3a	4a	5a

<Double wiring>

Pin No.	1	2	3	4	5	6
Valve No.	COM	1a	(Void)	2a	(Void)	(Void)

Double solenoid valve stations only

<Standard wiring>

Pin No.	1	2	3	4	5	6
Valve No.	COM	1a	1b	2a	2b	(Void)

Mix (Single and double mixed)

<Standard wiring>

Pin No.	1	2	3	4	5	6
Valve No.	COM	1a	2a	2b	3a	4a

<Double wiring>

Pin No.	1	2	3	4	5	6
Valve No.	COM	1a	(Void)	2a	2b	3a

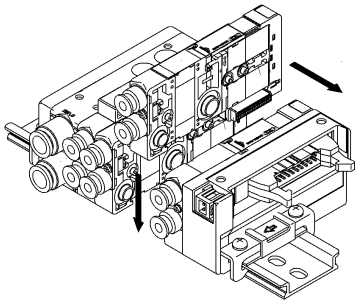
Wiring between wiring block and valve block of reduced wiring structure

⚠ CAUTION

■ When increasing the number of manifold, do not exceed the allowed maximum station number. Exceeding the number of allowed manifold may cause unintentional operation of valve block causing malfunctioning of the device.

■ Valve block, supply block and exhaust block are provided with internal wiring connectors which perform wiring connections upon disassembling/assembling of block manifold, requiring no special wiring. The wiring structure pattern diagram is shown below.

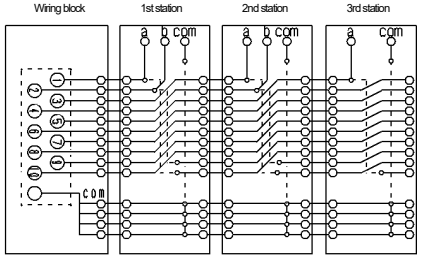
■ There is a rule/pattern between the connector pin numbers of the wiring block and wired valves. When connecting valve and control device, refer to "TM1C wiring method" described on the left.
This rule/pattern must be taken into account when increasing/decreasing the number of valve blocks.



Wiring structure pattern diagram

Figure on the right shows 4E0 wiring structure which does not correspond to actual specification.

The diagram shows an example where:
1st and 2nd station = double solenoid
3rd station= single solenoid

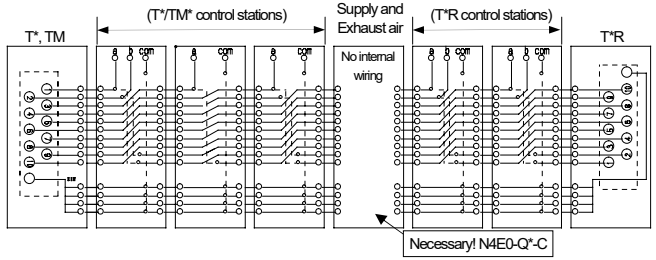


Mix wiring block

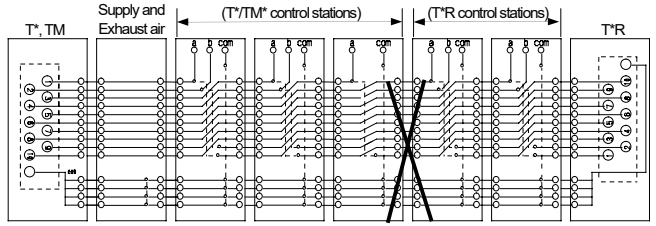
⚠ CAUTION

For mix wiring block specifications which use T*R (right side specifications) for the wiring block, short-circuiting of the signal wires between the wiring blocks must be prevented.
If the left and right electric signals are connected, unintentional valve block operation will occur leading to failure.

Place the supply and exhaust block N4E0-*-C (no internal wiring) in between valves powered from the right side and valves powered from the left side.



Example of incorrect layout: Left and right wiring interfere at the center



● CKD Corporation
□ 2-250 Ouji Komaki, Aichi 485-8551, Japan
□ PHONE +81-(0)568-74-1338

For dealer information refer to our catalog or visit our website.
http://www.ckd.co.jp/