Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 59 for general precautions for using valves.

Product-specific cautions: Pilot operated 3, 4-port valve MN3E00/MN4E00/MN3E0/MN4E0 Series

Design/selection

1. Self-reset

⚠WARNING

■ The self-reset is available for the valve block solenoid position class.

With both self-reset, “differential pressure return” and “differential pressure spring return”, the main valve returns to the origin (self-resets) when OFF under normal pressures. However, if the supply pressure is 0 in the ON state,

· The “differential pressure return” holds the current position.

· The “differential pressure spring return” will return to the origin with the spring force.

Select the type based on the interlock specifications of the device in use.

Main valve hold/reset status list

Valve			Source pressure down when ON	→ Reset source press	Power supply cutoff when ON
N3E00 N3E0	1/11	3-port valve single NC/NO self-reset (differential pressure spring return)	OFF (origin) movement	ON movement	OFF (origin) movement
	2/21	3-port valve double NC/NO self-hold	ON position holding		ON position holding
	66/67/76/77	Two 3-port valve integrated NC/NO self-reset (differential pressure return)	ON position holding		OFF (origin) movement
	66S/67S/76S/77S	Two 3-port valves integrated, NC/NO self-reset (differential pressure spring return)	OFF (origin) movement	ON movement	OFF (origin) movement
N4E00 N4E0	1	4-port valve 2-position single self-reset (differential pressure spring return)	OFF (origin) movement	ON movement	OFF (origin) movement
	2	4-port valve 2-position double self-hold	ON position holding		ON position holding
	3/4/5 (N4E0 only)	4-port valve 3-position	OFF (origin) movement	ON movement	OFF (origin) movement

2. Check valve

⚠WARNING

■ Check valve blocks back pressure from adjacent pneumatic devices, etc. However, the structure does not permit continuous pressure holding, so do not use for purposes other than blocking back pressure.

3. Built-in individual power supply function (AUX)

⚠WARNING

■ The polarity of the reduced wiring side and individual power supply side is a **plus common**.

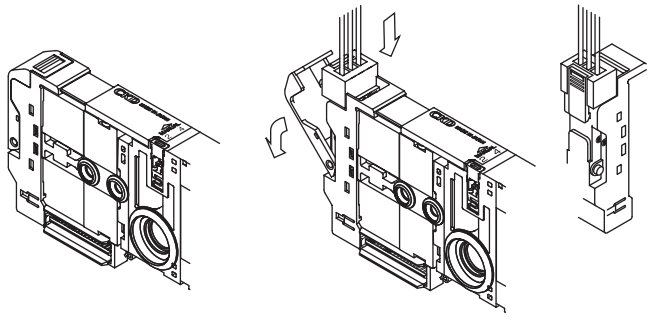
Normal operation will be impossible if the polarity is incorrect.

Use different power supplies for the reduced wiring side and the individual power input side.

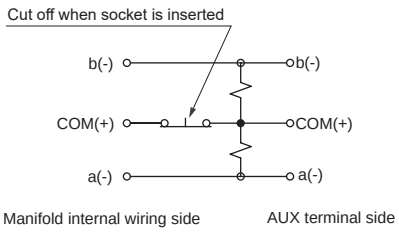
If the same power supply is used, the reduced wiring side’s wiring will not be cut off, resulting in incorrect operation.

■ Inputting individual power

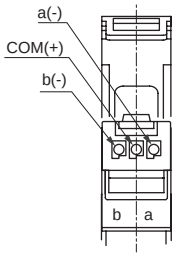
Open the wiring cover and connect the power input socket Connect (N4E0-SOCKET-S/D).



When the power input socket is connected, the valve’s internal wiring will be temporarily separated from the reduced wiring in the manifold, so power can be supplied from an external source.



Outline of AUX terminal polarity and internal circuit



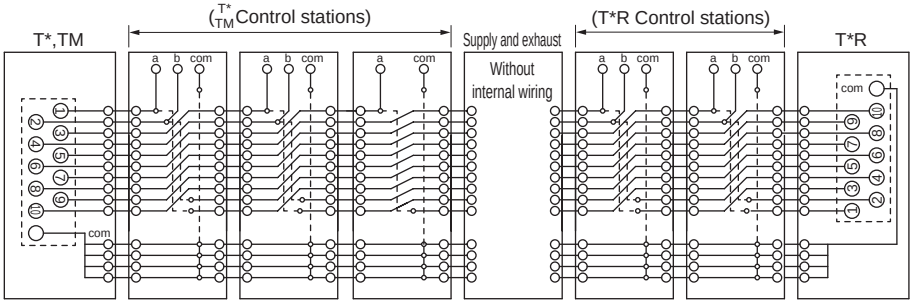
Valve block upper socket insertion diagram

Design/selection

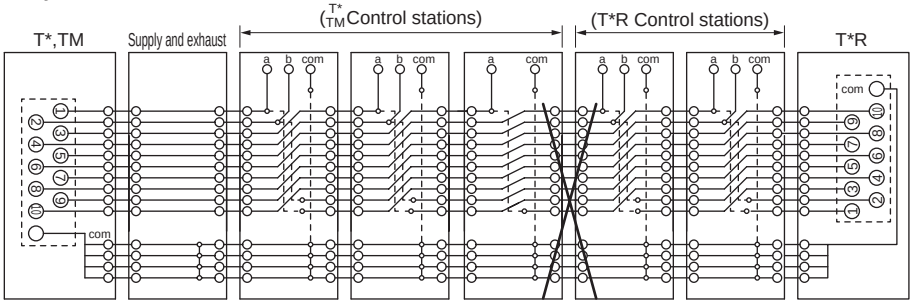
4. Wiring block mix

⚠WARNING

■ When using the mixed wiring block specifications by using 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 signals are connected, unintentional valve block operation will occur and equipment may be damaged.
Lay out the supply and exhaust block N4E0-Q*-C (specifications without internal wiring) between the valves supplying power from the left side and the right side.



Example of incorrect layout The left and right wires interfere at the center.



5. Surge suppressor

⚠CAUTION

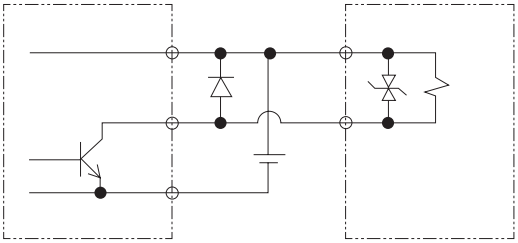
■ The surge suppressor attached to the solenoid valve is intended to protect the output contacts for the solenoid valve drive. There is no significant protection for the other peripheral devices, and devices could be damaged or could malfunction due to a surge. As well, surges generated by other devices may be absorbed and cause damage such as burning. Note the following points.

① The surge suppressor functions to limit solenoid valve surge voltage, which can reach several hundred volts, to a low voltage level that the output contact can withstand. Depending on the output circuit used, this may be insufficient and could result in damage or malfunction. Check whether the surge suppressor can be used within the surge voltage limit of the solenoid valve in use, the output device's withstand pressure and circuit structure, and by the degree of return delay time.
When necessary, provide other surge countermeasures. The inverse voltage surge generated when OFF can be suppressed to the following levels.

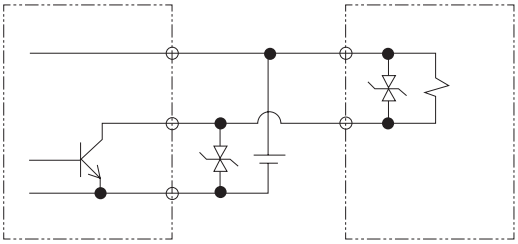
Specification voltage	Inverse voltage when OFF
12 VDC	Approx. 27 V
24 VDC	Approx. 47V

② If the output unit is an NPN, the output transistor may be subject to the voltage shown in the table plus the power supply voltage. Make sure to implement a contact protection circuit to avoid the risk.

[Output transistor protection circuit: Installation example 1]



[Output transistor protection circuit: Installation example 2]



③ When solenoid valves are connected in parallel with other components or solenoid valves, inverse voltage is applied to these components and/or solenoid valves when the solenoid valve is turned OFF. Even in the case of a solenoid valve with 24 VDC surge suppressor, a surge voltage may reach negative tens of volts for same models. This inverse polarity voltage may cause damage or malfunctions to other components connected in parallel. Avoid parallel connection of devices susceptible to inverse polarity voltages, e.g., LED indicator lamp. When driving several solenoid valves in parallel, the surge from other solenoid valves may enter the surge suppressor of one solenoid valve, and it may burn depending on the current value.
When driving several solenoid valves with surge suppressors in parallel, surge current could concentrate at the surge suppressor with the lowest limit voltage and cause similar burning. Due to the variations in surge suppressor limit voltage that exist even among solenoid valves of the same model No., in the worst case the surge suppressor may burn out. Avoid driving several solenoid valves in parallel.

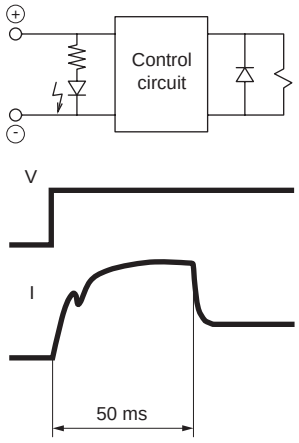
④ The surge suppressor incorporated in the solenoid valve will often be short-circuited if it is damaged by overvoltage or overcurrent from other solenoid valves. Where there is a failed surge suppressor, if a large current flows when the output is ON, in the worst case scenario, the output circuit or solenoid valve could be damaged or ignited. Do not continue energizing in a state of failure.
Additionally, to prevent large currents from continuing to flow, connect an overcurrent protection circuit to the power supply and drive circuit, or use a power supply with overcurrent protection.

6. Low exoergic/energy saving circuit

⚠CAUTION

■ Do not use this valve in an environment where the vibration and impact exceed specifications. This may result in valve malfunction.

With the type with low exoergic/energy-saving circuit, the control circuit is built into the valve block. This structure lowers the current value when the coil is suctioned and held. Only plus common polarity is used.



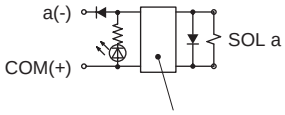
Individual specifications for low exoergic/energy saving circuit

Item			Description	
			N4E00	N4E0
Energizing current A	When starting	24 DC	0.017	0.025
		12 DC	0.033	0.050
	When holding	24 DC	0.009	0.013
		12 DC	0.018	0.025
Power consumption W	When starting	24 DC	0.4	0.6
		12 DC		
	When holding	24 DC	0.22	0.3
		12 DC		

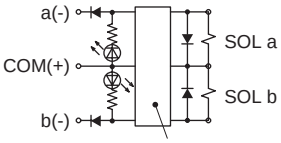
7. Polarity

⚠CAUTION

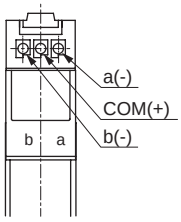
■ When selecting the low exoergic/energy-saving circuit, the connection is dedicated for plus common. Note the connection polarity. For details on surge suppressor, refer also to “5. Surge suppressor” on page 960.



Single/energy saving circuit built in



Double/energy saving circuit built in



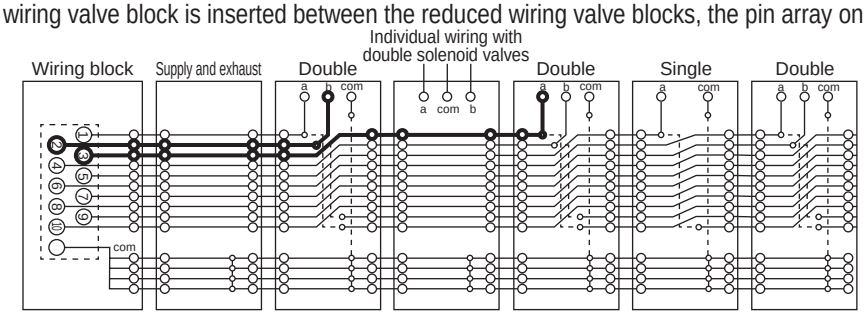
Upper view of valve block

■ The energized state cannot be maintained if power is cut off instantaneously for 30 ms or less on the power source driving the solenoid valve. If any disturbance has caused up to 30 ms instantaneous power cut-off of the solenoid valve after being continuously energized, cut the power OFF for 50 ms or more before switching the solenoid valve ON again.

8. Wiring in manifold when mixing with reduced wiring

⚠CAUTION

■ The internal circuit of the individual wiring valve block is completely separated from the reduced wiring electric circuit in the manifold. Even if the individual wiring valve block is inserted between the reduced wiring valve blocks, the pin array on the wiring block side will not change.



The pin array on the wiring block side eliminates the individual wiring in order from the first station, and shifts the blocks in order.

Mounting, installation and adjustment

1. Manual override

⚠WARNING

■ The 4E Series is a pilot operated solenoid valve. The main valve does not switch over even if the manual override is operated unless air is supplied to the P-port (PA port for external pilot).

■ Manual override protective cover is provided as standard. The protective cover is closed when shipped. Therefore, the manual override device cannot be seen when delivered. Open the protective cover to operate the manual override. Note that the protective cover cannot be closed unless the locking manual override is released.

■ Manual override is used for both non-locking and locking. Holding down and turning the button locks the valve. Be sure to press down before rotating to lock. If manual override is turned without being pressed down, it could be damaged or air could leak.

2. External pilot piping port

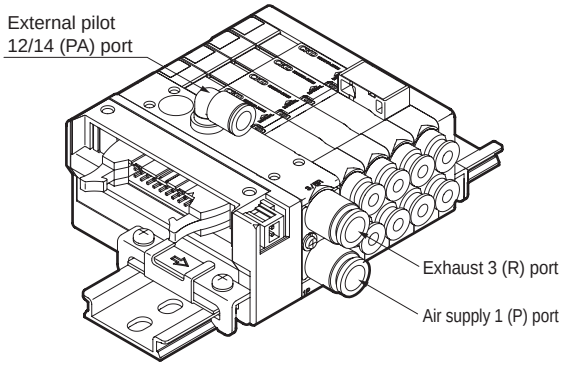
⚠CAUTION

■ The external pilot has a separate pilot air supply. As ø6 push-in fitting is used to supply the pilot air, check that the piping connection position is correct. Malfunctions could occur if the piping is incorrect.

Port indication

Applications		Indication (ISO standards)
Pilot air	Pilot air supply port	12/14

* Port A/B pressurization and port R pressurization are not possible.

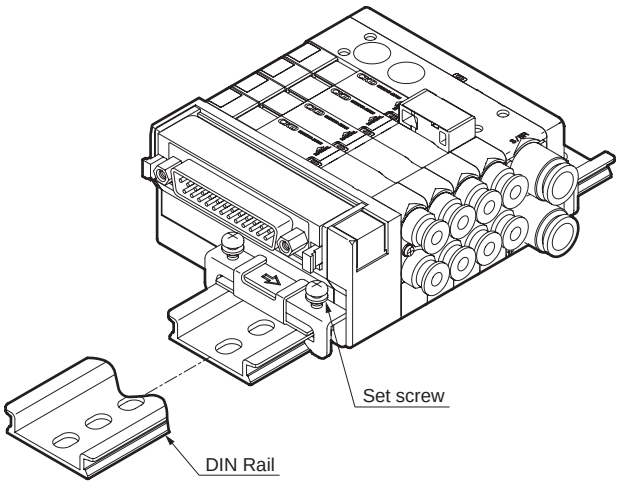


The external pilot air supply port is the ø6 push-in fitting (ø5/32" when inch fitting is selected) on the top of the supply and exhaust block.

3. How to install manifold

⚠CAUTION

■ The 4E Series is dedicated for DIN rail mounting. The manifold could fall off or be damaged if not installed correctly. If the manifold weighs more than 1 kg, 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. Use the specifications to calculate the weight. Also calculate the weight of the other devices installed. (Refer to pages 873 and 897 for weight.)



4. Lead wire connection

■ The following lead wires are used in the 4E Series individual wiring valve blocks and types with built-in individual power supply function (AUX).

Conductor size	Outer diameter of insulator
AWG#26	1.32

When wiring the installed manifold, ensure that tension is not applied to the lead wire.

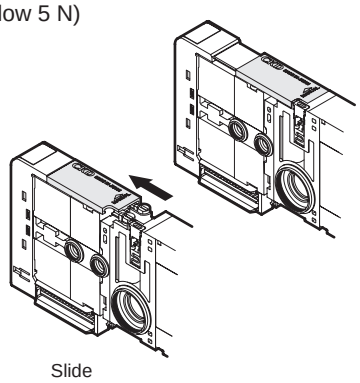
Use/maintenance

1. Manual override

⚠WARNING

■ Opening and closing the manual protective cover

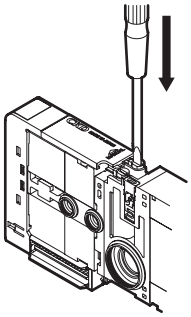
Do not excessively force the manual protective cover when opening and closing it. Excessive external force could cause failures. (Below 5 N)



■ How to operate manual override

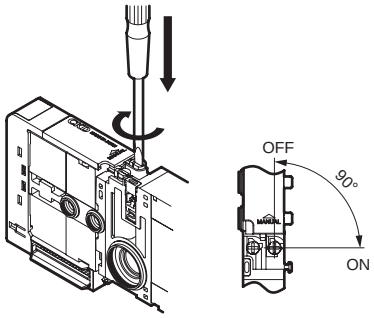
①Push & non-locking operation

Push in the direction of the arrow until it stops.
Release to cancel.



②Push locking operation

Push and hold the button and turn it 90° in the direction of the arrow.
The function is not canceled even when the button is released.



WARNING

When conducting manual operations, make sure that there are no people near the operating cylinder.

2. External pilot piping port

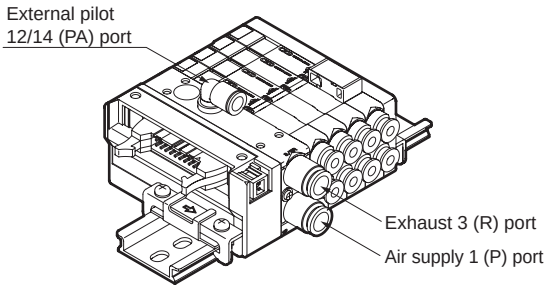
⚠CAUTION

■ Take care with supply pressure for the two 3-port valves integrated.

The valving element of the two 3-port valves integrated is operated with the main (P-port) supply pressure.

· Check that the main pressure (P-port) is no higher than the pilot pressure (PA port)

· Ensure that the main pressure (P-port) does not drop below 0.2 MPa.

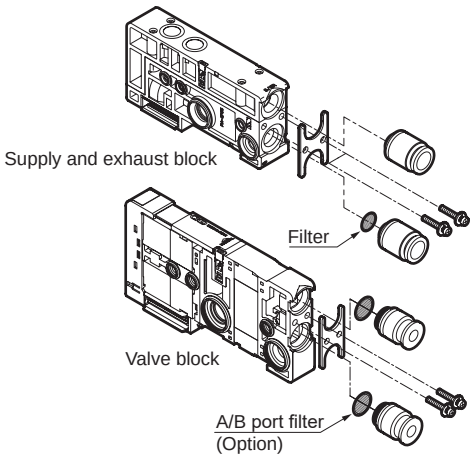


3. Port filter

⚠CAUTION

■ The port filter prevents the entry of foreign matter and other manifold issues (mesh hole ø0.3 mm). This does not improve the quality of the compressed air, so read Warnings and Precautions in the Introduction, then mount, install, and adjust the filter accordingly. Do not detach or press down the port filter forcibly. The filter could deform, causing problems.

If contaminants and foreign matters are found on the filter surface, blow them off lightly, or remove them with tweezers, etc.



4. Pneumatic source

⚠CAUTION

■ As this product has non-lubrication specifications, adding oil may cause leakage of the grease initially sealed in, which may prevent the product from displaying its maximum performance.