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CKD

SM－196102－A

INSTRUCTION MANUAL

FD $\begin{matrix}2\\3\end{matrix}$E－ $\begin{matrix}02\\03\\04\end{matrix}$ － 4 － 2 $\begin{matrix}TP\\GP\end{matrix}$

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

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For Safety Use

To use this product safely, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, read this instruction manual carefully for proper operation.

Observe the cautions on handling described in this manual, as well as the following instructions :

⚠ Precautions

- Do not touch electric wiring 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.

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General

This electromagnetic valve is of a four-way type, which is used for class 1 danger zone (in which it is possible to generate a danger atmosphere at a normal condition) and Class 2 danger zone (in which it is possible to generate a danger atmosphere at an abnormal condition) .

And also, the explosion-proof construction is of a pressure-resisting explosion-proof construction (d), explosion Class 2 and ignition grade G4, which passed an authorized examination by the Industrial Safety Research Corporation.

The pressure-resisting explosion-proof construction is constructed so that, in case of accidental ignition and explosion on the intered explosive gas from the external space owing to sparking and over-heating due to shortcircuiting at solenoids, terminal connecting parts, etc., it can prevent the influence on the explosive gas, limiting on the explosion in the explosion-proof machinery enclosure.

The bolt on the part subjected to the influence on the function of the explosion-proof is locked with a key, however, it will lose the explosion-proof efect to loosen the bolt, accordingly, it should be especially noted that any body except the responsible preson don't touch it.

And also, a leading wire system became necessary for the pressure-resisting explosion-proof construction, consequently, a pressure-resisting stud system has been adopted for the leading wire from a teminal box to the main body, and its connecting terminal is placed in the terminal box, providing with a sufficient explosion-proof means. In addition, as an external leading wire-system entering the terminal box, a connecting method by a conduit tube screw is, as a rule, adopted.

The explosion symboles d2G4 are clearly marked on the bonnet, and said symboles show the range of the explosive gas allowed to exist in the air under said pressure-resisting explosion-proof construction, and it means the usage for the common works, but it should not be allowed to apply for the marine usage.

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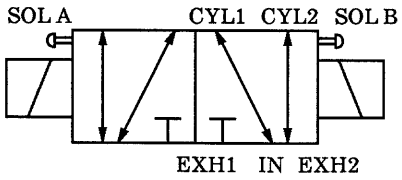
1. OPERATING METHODS

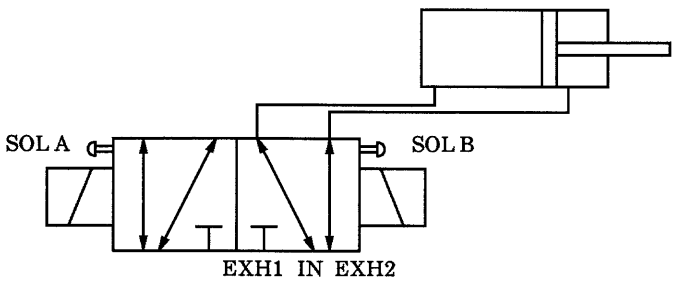
When dienergized IN ⇆ CYL-2 CYL-1 ⇆ EXH-1 EXH-2 ····· Stop
When energized IN ⇆ CYL-1 CYL-2 ⇆ EXH-2 EXH-1 ····· Stop

JIS Symbol

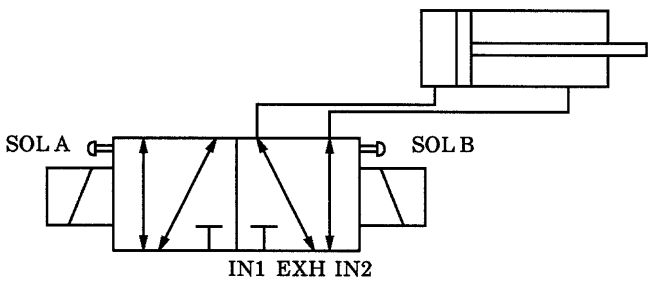


2. APPLICATION EXAMPLE

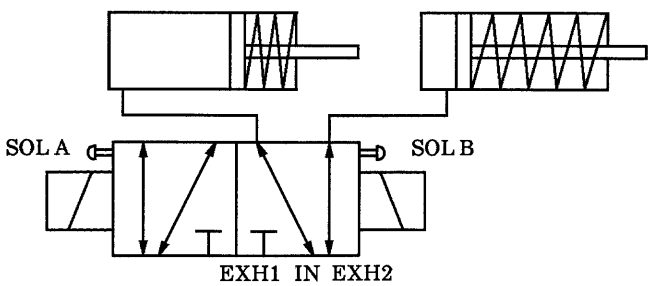
1) In case of operating the cylinder which the pressure is applied to its both sides.



2) In case of operating the cylinder which the different pressure is applied to the each side from the each exhaust port.



3) In case of operating an one-side cylinder alternatively or a desired one out both cylinders, as a 3-way.



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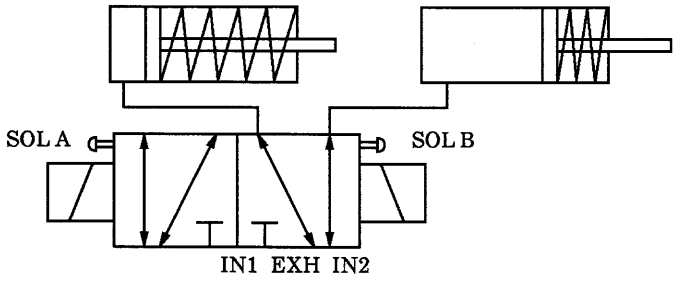
4) In case of changing the pressure of each cylinder by that a pressure cylinder is by turns operated by an one-side-cylinder according to the different air pressures supplied respectively out of two exhaust ports, as a 3-way.



5) Others

(1) This electromagnetic valve is of two-positioned type, having no neutral position.

(2) When the speed control on the cylinder is required, connect a metering valve (Needle type) to the exhaust side.

(3) Besides the operation from electric signal, this valve operates on pushing the rod by finger after removing the nut on the side of the solenoid.

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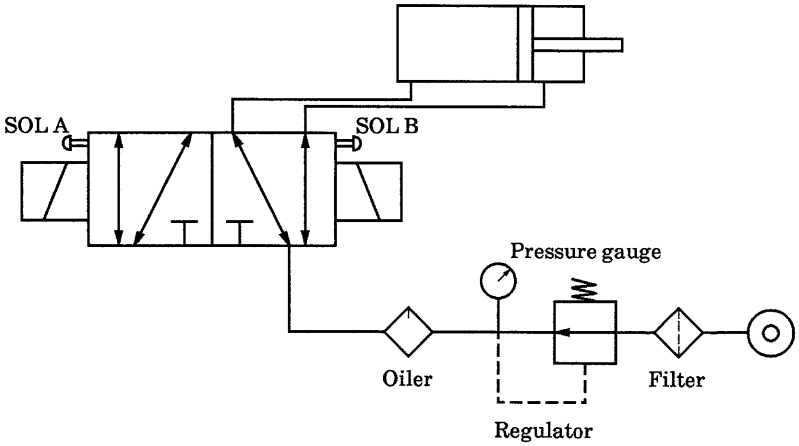
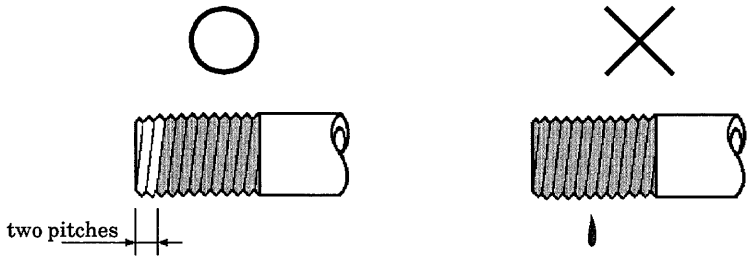
3. PIPING



1) Thoroughly clean up inside pipes before installation of the electromagnetic valve.
   (1) Remove dust and flashes.
   (2) Do not apply the sealing agent to first two pitches of the screw.



2) In front of the electromagnetic valve, please install a filter ($\simeq 5\mu$m) and a lubricater. In case of using recipro compressors which exhaust wrong compressed air for the valve, please install a filter for removing tar. Pour turbin oil 1,ISO VG32 (non additive) into a lubricater. Don't use spindle oil or machin oil.
3) The valve should be installed in such a position as its contact surface is level with the spool (of the piston assembly).
4) Upon installation, do not apply an excessive force to the electromagnetic valve.
5) Select a place with the least possible amount of vibration or shock for installation of pipes.
6) After completion of the piping, thoroughly check every part for leakage.
7) Secure the space for tool maneuver in the event of maintenance services.
8) Periodically discharge the drain out of air filter.

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4. ELECTRIC WIRING

1) Wire in proportion to JIS (Japanese Industrial Standards) Recommended Practices for Explosion-Protected Electrical Installations in General Industries.
2) Use electrical wires with cable core of diameter more than 0.75mm^2.
3) Select the cable for G type from the following 3 kinds (explosion-proof approval cables).

Sort of cable	Core wire	Nominal section area	Strand discription	Finish dia.
Polyethylene cable (EV)	2 cores	2mm^2	7/0.6	ϕ10.5
600V polyvinyl chloride wire polyvinyl sheath cable (VV)	2 cores	2mm^2	7/0.6	ϕ10.5
Control polyvinyl chloride wire polyvinyl sheath cable (CVV)	2 cores	2mm^2	7/0.6	ϕ10.5

4) Insert a fuse of capacity 3A for protection of electrical circuits.
5) Whenever possible, use electrical circuit switches or relays of snap action with contact capacity more than 10A.
6) Screw size of the guide port to pass through lead wire from outside is G1/2 (JIS B 0202).
(JIS means Japanese Industrial Standard)

5. CAUTION

1) Don't take this one to pieces because to keep the explosion-proof function.
2) Take care to keep the dust-proof in case of dusty ambient air.
3) Check the operation on manual befor running in case of long time pause.
4) At the end of running, stop the compressed air supply and exhaust the air and drain.