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CG1-4008-A

INSTRUCTION MANUAL

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

- 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 operation 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.

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 entered explosive gas from the external space owing to sparking and over-heating due to short-circuiting 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 person 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 terminal 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.

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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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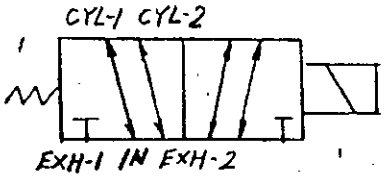
• Operating Methods

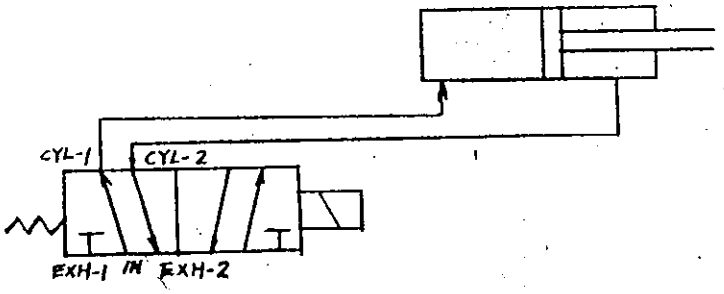
When dienergized IN⇄CYL-1 CYL-2⇄EXH-2 EXH-1 ... stop

When energized IN⇄CYL-2 CYL-1⇄EXH-1. EXH-2 ... stop

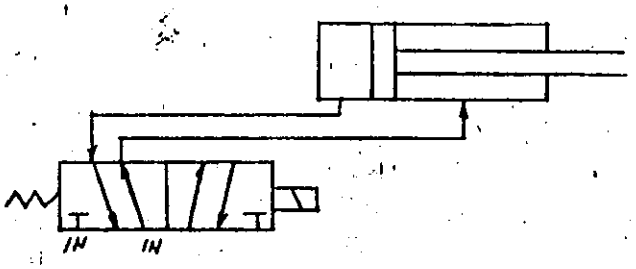


"JIS" SYMBOL

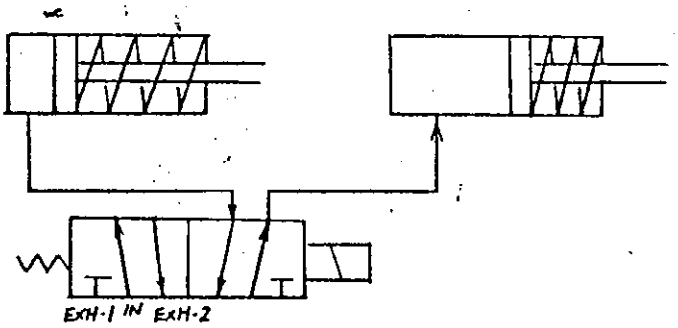
1. In case of operating the cylinder which the pressure is applied to its both sides.



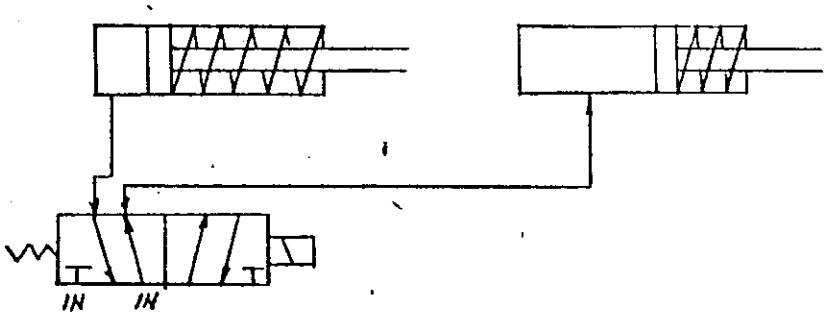
2. When the different pressures are respectively applied out of two exhaust ports, it is possible that, in the cylinder which the pressure is applied to its both sides, each reciprocity outlet port can be intentionally changed or equalized.



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



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 4-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.

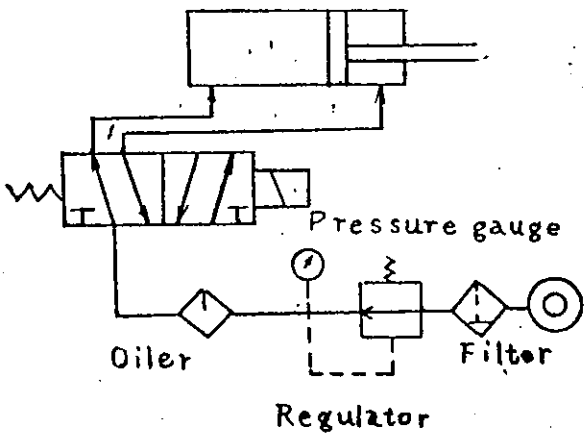
(3) In addition to the operation by electrical signals, the equipment can be manually controlled also by pushing the solenoid over the rubber bush attached to it with a device like a rod.

Wiring

1. Use electrical wires with cable core of diameter more than 0.75mm^2.

2. Insert a fuse of capacity 3A for protection of electrical circuits.
3. Whenever possible, use electrical circuit switches or relays of snap action with contact capacity more than 10A.
4. The voltage is indicated on the solenoid housing.
5. The diameter of the screw at the lead wire inlet is PF 1/2.

Piping



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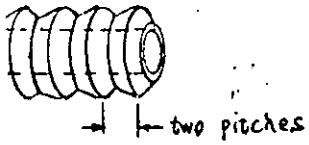
1. Thoroughly clean up inside pipes before installation of the electromagnetic valve.



   (a) Remove dust and flashes.

   (b) Do not apply the sealing agent to first two pitches of the screw.

2. Install the filter and the oiler in front of the valve. Use turbine oil #90.

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.

Maintenance Service

(A) Disassembly

1. Disassembly of the Valve

   (1) Remove the cover (FS2E, FS3E only).

   (2) Remove the solenoid.

(3) Remove the cap and take out the spring.

(4) Pull out the spool.

(5) Pull out the sleeve.

For details refer to the disassembly diagram.

2. Caution

(1) Do not leave the spool in the atmosphere too long a period after its removal.

(2) Be sure to wear gloves when extracting the sleeve and the spool. Never handle them with bare hands because the corrosion may develop where their hands touched.

(3) Whenever possible, do not remove the sleeve. (O-ring may be broken upon removal of the sleeve.)

(4) Before assembly of the unit, thoroughly clean and remove dust off such places as the outer surface of the piston, spring holes and the inside of the sleeve.

(5) Fix the cap and the solenoid firmly. (They are liable to come off when the valve is subjected to frequent operation.)