CKD

SM−318580−A/2

INSTRUCTION MANUAL

Block Valve

FPV

- 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.

2nd.

CKD Corporation

To Operate This Product Safely

For safety use, it is necessary to have a fundamental knowledge as to the pneumatic device, including the material, piping, electricity and mechanism or the like. (ISO 4414*1 and JIS B 8370*2)

Our company is, therefore, not in a position to assume the responsibility for any accident attributable to a person having no such knowledge and wrong handling.

Since the applications are extremely varied among customers, we cannot grasp such various uses. No performance may be displayed, depending on the operating conditions, and such conditions may lead to an accident; it is, therefore, necessary to completely check the product specifications according to the applications and uses at customer's end and understand the directions for use thoroughly before making a decision.

Various safety measures are taken for this product, however customer's mis-handling may lead to an accident. To avoid this, "be sure to read the Instruction Manual carefully and have a thorough understanding of the contents before use."

In addition to the precautions for handling that are described in this Manual, also pay special attention to the following items.

These precautions are classified into "CAUTION", "WARNING" and "DANGER" as described below to indicate the harm and damage level and possibility of their occurrence:

⚠ **DANGER** : "DANGER" is used when a person may be exposed to an impending danger that mishandling this product leads to an accident resulting in death or serious injury.

⚠ **WARNING** : "WARNING" is used when a person may possibly die or be seriously injured if this product is handled inadvertently.

⚠ **CAUTION** : "CAUTION" is used when a person may possibly be injured if this product is mis-handled and there may arise physical damage.

*1) ISO 4414 : Pneumatic fluid power ··· Recommendations for the application of equipment to transmission and control systems.

*2) JIS B 8370 : Pneumatic System Rules

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FPV

No. SM-318580-A／2

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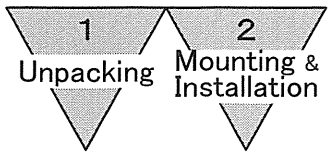


1. Unpacking Precautions

⚠ CAUTION: Do not detach the packing bag just until piping work is started.

- If the packing bag is detached before piping connection work, foreign particles will intrude therein from the piping port, resulting in failure and malfunction.

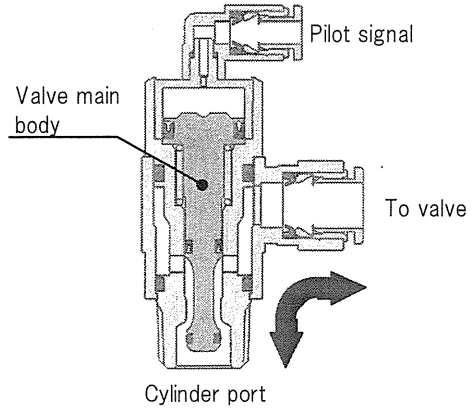
1) Ensure that your ordered product is identical to Model No. or Parts No. marked on the product.
2) Check to see if no damage is caused to the product external part.

2. Mounting & Installation Precautions

⚠ CAUTION:

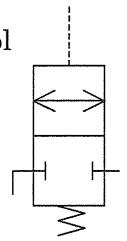
1) Before replacing the tube, be sure to stop air and ensure that no residual pressure is present.
2) Always mount this unit to the piping port within the recommended tightening torque since screw looseness, air leaking and damage are caused.
3) After completion of piping connections, perform the operation or performance test several times.
   If the cylinder internal pressure is relieved before the pilot air pressure is relieved, the intermediate stop and position locking functions, etc. may not be satisfied.
   When the effective sectional area of the pilot piping is small (the piping is long and choked, etc.), take special care.
4) The pilot air pressure and main pressure should fall within the specification range.
   When the actuator load factor is high, the main pressure becomes high, and the pressure ceases to be maintained.
5) During and after mounting, do not apply any lateral load to the main body.
6) When the piping connection is completed and compressed air is supplied, be sure to check the piping connection part and all portions of the actuator for air leaking.
   The function of position locking and intermediate stop or the like may cease to work normally.
   Also, when long hours' position locking and intermediate stop are carried out, use other methods than compressed air sealing.

2. 1 Principle of Operation



When a pilot signal is present, the valve main body opens, connecting the valve and cylinder. When no pilot signal is present, however, the valve main body is closed, cutting off the valve and cylinder port.
The left figure shows the internal structure when the pilot signal is sent and the valve main body is open.

JIS Symbol



2. 2 FPV Valve Mounting

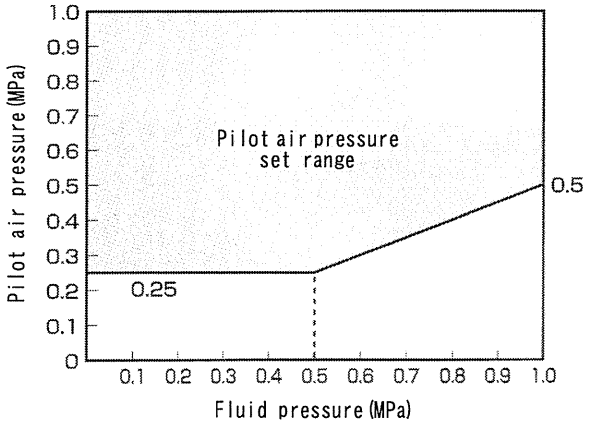
1) After temporarily tightening the FPV lightly to the port by hand, regularly tighten it with the adequate tool.
Also, during piping connection, tighten it within the range of the recommendable tightening torque.

〔Recommended Tightening Torque〕

Connecting Screw	Tightening Torque N·m
M5	1.0 to 1.5
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15
Rc1/2	16 to 18

2. 3 Pilot Air Pressure

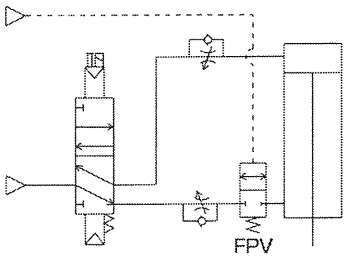
Use the unit with the pilot air pressure set within the following specified range



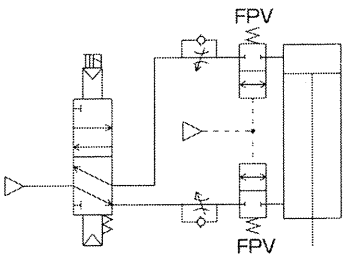
The pilot air pressure in which the fluid pressure is 0.5 MPa max. must be 0.25 MPa or higher.
The pilot air pressure in which the fluid pressure exceeds 0.5 MPa must be 1/2 of the fluid pressure or higher.

2. 4 Sample Use

・Used in cylinder position locking circuit



・Used in cylinder intermediate stop circuit



3. Maintenance

3. 1 Disassembly

1) No product can be disassembled.
If a product should fail, replace it with a new one.

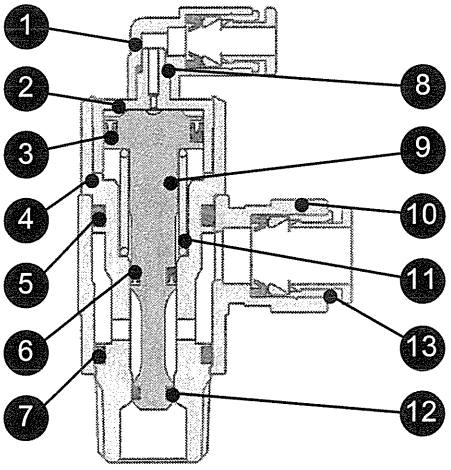
3. 2 Troubleshooting

Trouble	Probable Cause	Suggested Remedy
Even when the pilot air is bled, air flows.	Dust or dirt adheres to the valve seat part.	Eliminate dust by air flushing.
There is a time difference before the cylinder comes to a halt after the pilot air is bled.	Since the effective cross sectional area of pilot air passage is small, no pilot signal can be exhausted completely.	Increase the effective cross sectional area for the pilot air passage; for example, make the piping shorter.
Even when the pilot air is pressurized, the valve is not opened.	The pilot air pressure is lower than specified.	According to para. 2.3 "Pilot Air Pressure" above, adjust the pilot air pressure.

3. 3 Disposal

1) The materials used for this product are metal, plastics and synthetic rubber.
Since this product cannot be burnt, it should be disposed of as industrial waste.

4. Internal Structure and Parts List

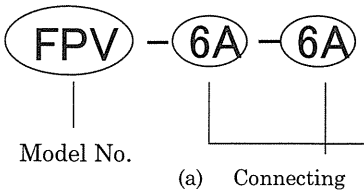


Parts No.	Parts Name	Material
1	Joint body	Polybutylene terephthalate (Nonflammable resin)
2	Rotary axis A	Brass (Electroless nickel plating)
3	Packing	Nitrile rubber
4	Rotary axis B	Brass (Electroless nickel plating)
5	O-ring	Nitrile rubber
6	Packing	Nitrile rubber
7	O-ring	Nitrile rubber
8	O-ring	Nitrile rubber
9	Valve main body	Brass (Electroless nickel plating)
10	Body	Polybutylene terephthalate (Nonflammable resin) <NOTE 1>
11	Spring	Stainless steel
12	O-ring	Nitrile rubber
13	Push-in joint	

NOTE 1: The internal thread type is made of zinc alloy diecast.

5. Product Specifications

5. 1 Model Coding



(a) Connecting Port Size	
M5	M5
6A	R1/8
8A	R1/4
10A	R3/8
15A	R1/2

(b) Applicable tube outside diameter						
		Connecting Port Size				
		M5	R1/8	R1/4	R3/8	R1/2
06	φ6	●	●	●		
08	φ8		●	●	●	
10	φ10				●	●
12	φ12					●
6A	Rc1/8		●			
8A	Rc1/4			●		
10A	Rc3/8				●	
15A	Rc1/2					●

: Not manufacturable.

5. 2 Specifications

Item	FPV-M5	FPV-6A			FPV-8A			FPV-10A			FPV-15A		
Connecting port size	M5	R1/8			R1/4			R3/8			R1/2		
Main side applicable tube outside diameter	φ6	φ6	φ8	Rc1/8	φ6	φ8	Rc1/4	φ8	φ10	Rc3/8	φ10	φ12	Rc1/2
Pilot side applicable tube outside diameter	φ4			M5	φ4		M5	φ4		Rc1/8	φ4		Rc1/8
Fluid used	Compressed air												
Maximum working pressure MPa	1.0												
Minimum working pressure MPa	0												
Proof pressure MPa	1.5												
Pilot air pressure MPa	Refer to "2.3 Pilot Air Pressure".												
Fluid temperature ℃	5 to 60												
Ambient temperature ℃	0～60 (no freeze)												
Mass g	28	26		36	50	51	68	90	93	120	143	145	192
Effective sectional area mm²	1.3	5			10			17			27		