CKD

SM-302688-A／3

INSTRUCTION MANUAL

Quick Valve

2QV･3QV Series

- 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.

3rd.

CKD Corporation

Introduction

Thank you for purchasing CKD's 2QV/3QV Quick Valve.
Read though this instruction manual and be familiar with the description before operating the product.

1. Purpose and application
   This valve is a manually operated pneumatic two- or three-port valve used for general industrial machines and equipment.
   It is designed for air blowing of pneumatic circuits and residual pressure release of pneumatic cylinders.
2. General precautions
   1) This instruction manual covers basic items related to the handling of the product ranging from unpacking and fabrication to disposal.
   2) This product is designed and manufactured as a general industrial machine part. Therefore those who have basic knowledge and experience about pneumatic devices including material, piping, electric system and mechanical system related to this product should handle the product. (ISO 4414 *1, JIS B 8370 *2)

   Read carefully before starting design and fabrication and assure the safety of the machine and equipment and take consideration for adequate handling of the product.
3. Model selection
   The usage and application of the product vary among customers and we cannot comprehend all of them. Therefore choose the product matching your application and usage.
   Products unsuitable for your specifications will not only fall below the needed performance but also cause unexpected accidents.

*1) ISO 4414 : Pneumatic fluid power … Recommendations for the application of equipment to transmission and control systems.
*2) JIS B 8370 : General rule for pneumatic systems

4. Safety

In this instruction manual, not only the handling method but also the degree of danger caused by mishandling and urgency of warnings are described under the following three ranks. Be familiar with the meaning of the symbol when reading this manual.

⚠**DANGER:** **Wrong handling will cause danger accompanying deaths and serious injuries and acuteness of the danger is pressing and limited.**

⚠**WARNING:** **Wrong handling will cause danger accompanying deaths and serious injuries.**

⚠**CAUTION:** **Wrong handling will cause danger accompanying injuries and material losses.**

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Quick Valve
Manual No. SM-302688-A／3

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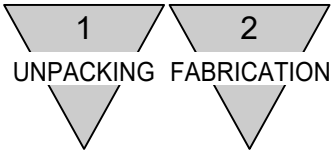


1. Unpacking

1) Check that the model number specified on the product is what you have ordered.

2) Check that the appearance is free from damage.

3) When storing, place in a polyethylene bag or the like to avoid entry of dust or foreign matter in the product.

2. Fabrication

2.1 Mounting conditions

2.1.1 Protection of product

1) Outdoor use
   Do not use this valve outdoors.
   Protect it in a cover or install it in a panel.

2) Cold climates
   When using in a cold district, take adequate measures against freezing.

3) Corrosive environment
   Do not use in corrosive or explosive gas atmosphere.

4) The sealing agent contains PTFE (tetrafluoroethylene) powder. Check that the material will cause no problem.

5) If the supplied compressed air includes ozone, the service life will be reduced. Contact us in this case.

2.1.2 Mounting orientation

1) The mounting orientation is arbitrary.

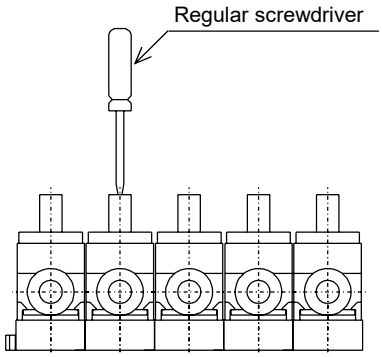
2) Use mounting holes or special brackets to fix the product.

3) Operation with 4.3G or larger vibration is out of the scope. Avoid such environment.

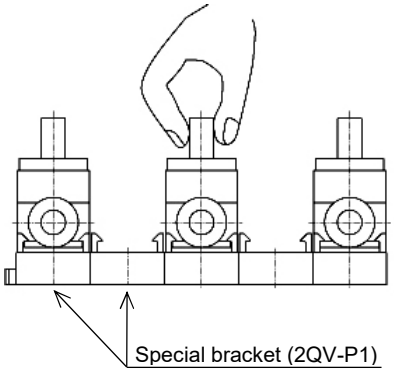
2.1.3 Maintenance space

1) Take consideration for safe work during maintenance and recovery from trouble and reserve sufficient maintenance space.
2) To use in a manifold, consider the following conditions.

- Installation to a manifold in a small space accompanies difficulty in manual operation. Use the slot (-) at the top of the knob and use a screwdriver or the like.



- To install in a manifold while taking priority in manual operation, install the valve at each other position to increase the ease of manual operation.



2.2 Piping

⚠WARNING:
1) Insert the tube securely until it makes contact with the tube end of the joint and check that it does not come off the joint.
2) Before changing the tube, be sure to stop compressed air and check that no residual pressure remains.

⚠CAUTION:

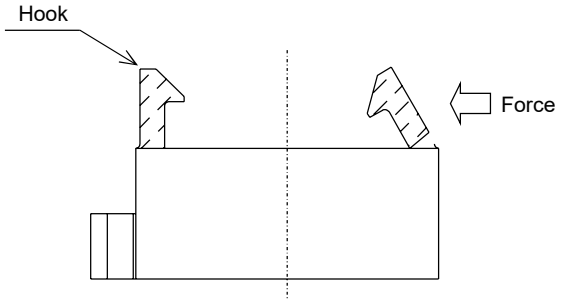
1) If nylon tube or urethane tube is used as a piping material, take care of the following.
   - Use the designated tube and CKD's plastic plug (GWP Series). Do not use metallic plugs because they will cause trouble.
     Accuracy in circumference of tube
     Polyamid tube ..... Within +/-0.1mm
     Polyurethane tube (up to ϕ6) ... Within +/-0.1mm
     (ϕ8 or larger) ... Within +0.1/-0.15mm
     Use the above tubes having 94° or larger hardness. Tubes that do not satisfy the diameter accuracy or hardness requirement will come off due to a deteriorated chucking force or, on the contrary, the tube may be too hard to insert. If it is inevitable to use a tube or plug other than the designated products, contact us.
   - Cut the tube at right angles without fail, using the special cutter.
   - Use while avoiding wear and scratches on the tube. Otherwise the tube may be squeezed or it may burst.
   - Do not reuse the tube because it is deteriorated and deformed.
   - Avoid making the tube into direct contact with other structures. Otherwise friction and breakage will be caused.
2) Do not use for constantly rotating, swinging or violent motions.
3) Do not bend the tube at smaller than the minimum bending radius.
   - When connecting the tube, reserve a margin to prepare for changes in the tube length due to the pressure, so that the minimum bending radius of the tube is assured.
4) Connect pipes so that the joint will not be disconnected because of the motion of the equipment, vibration and/or tension.
   - A disconnected exhaust tube in the pneumatic circuit will disable speed control of the actuator.
   - In case of a chuck retention mechanism, the chuck will be released, causing danger.
   - Check that the tube is inserted securely, and use it so that no tension is exerted on it.
     The tension will cause disconnection and/or breakage of the tube.
5) Do not allow twist, tension, and moment load between the joint and tube.
6) Do not retighten while exerting a pressure.
7) When using an urethane tube (U-95xx, NU-xx) in a vacuum, use the insert ring.
   - A squeezed tube will cause vacuum leaks.

1) When routing piping, be sure to flush the piping before connecting pneumatic devices.
   - Do not allow foreign matter inside pneumatic devices. When connecting pipes or inserting a tube, remove foreign matter first.
2) Install a 5μm or finer air filter in the upstream of each valve.
3) Adjust the flow direction (arrow) on the product with the flow direction of the fluid.
4) Tighten to the correct torque when connecting pipes.
   - Avoid air leakage and thread breakage. To avoid giving damage to the thread, tighten by hand at the first stage, before using a tool.
     Use the tool having the correct AF size and the wrench size.

Table 1

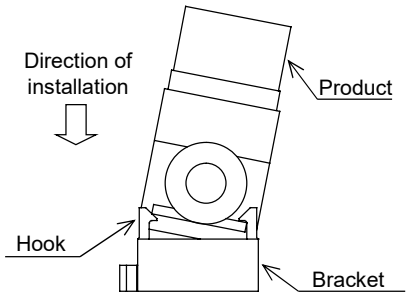
Connected screw	Tightening torque (N·m)
R1/8	3 to 5
R1/4	6 to 8
R3/8	13 to 15
R1/2	16 to 18

5) The valve is lubrication free and the lubricator is unnecessary. To lubricate, however, use turbine oil class 1, ISO VG32 (no additive).
6) The hook of the special bracket may be broken with an external force. Observe the correct operation method.

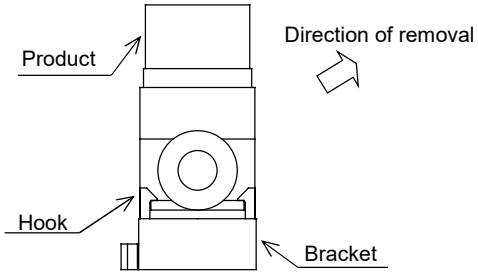


7) Bracket operation method

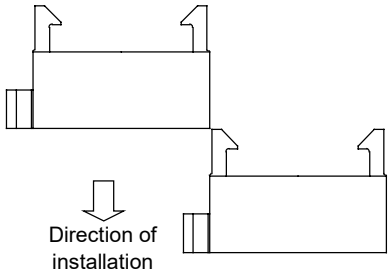
(1) Fix the bracket before using it. Insert the product at an odd angle into the bracket and fit to the hook during installation.



(2) To remove, incline the product slightly and disengage the hook on the single side.



(3) Fit the projection of the bracket into the groove of another bracket to use.



3. Pre-operation check (post-fabrication check)

3.1 Appearance check

1) Check that the valve is fixed at the piping or mounting hole, while pushing by hand.
2) Check that the screws are not loose.

3.2 Leak check

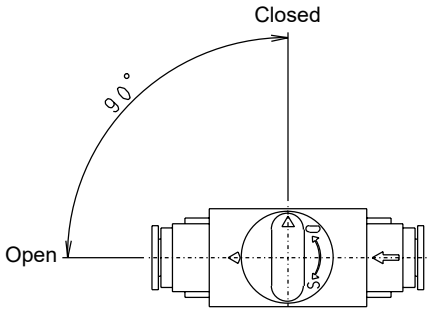
⚠CAUTION:
1) To supply compressed air after connecting pipes, do not supply at a high pressure first.
   - Piping connection will be disconnected and the tube will jump, causing accidents.

1) Apply leak detection liquid at joints of the piping with a brush to check for air leaks.
2) Repeat manual operation slowly to check for disconnected tubes, vibration, and noise.

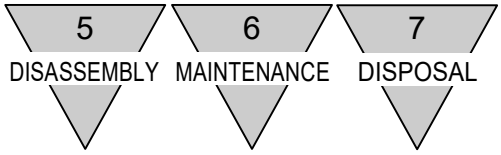
4. Adequate usage

⚠WARNING:
1) Be sure to operate within the specification scope of the product.
   - Do not use with fluids other than the compressed air or at pressures or temperatures out of the specification scope. Otherwise burst, disconnection of the tube and/or leakage will be caused.

1) The operation angle of this product is 90°. Do not turn beyond 90°.



2) Remove drain periodically if drain accumulates in the air filter.
3) If the filter element of the air filter is stained in black, adhesion of tar is probable. Periodically replace the filter element.
4) If the lubricator is used to lubricate, periodically supply lubricant to the lubricator.
   Use turbine oil class 1, ISO VG32 (no additive).



5. Disassembly

1) Do not disassemble this product.
   If failure is found, replace with a new one.

6. Maintenance

6.1 Maintenance and inspection

1) To use the product in the best condition, perform periodical inspection every year for regular operation.
2) For details of inspection, refer to Section 3 “Pre-Operation Check.”

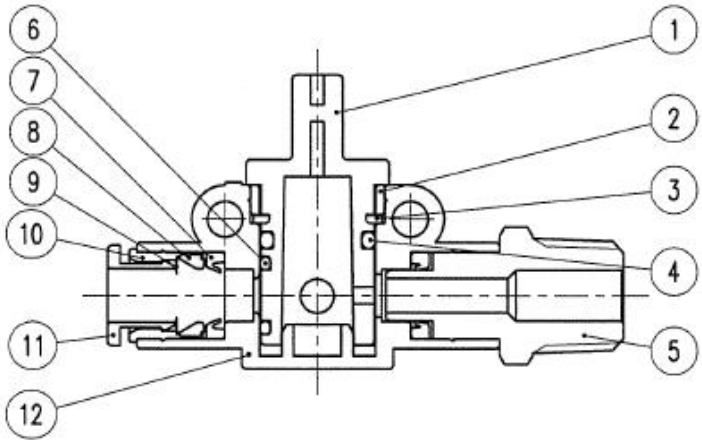
6.2 Maintenance parts

1) Do not disassemble this product. Replace the product if leakage, adhesion at the valve or other faults is found during operation.
2) The approximate replacement timing is 10,000 operation cycles.
3) During operation at lower frequencies, replace at least every five years under consideration for aging and deterioration of seal and packing.

7. Disposal

1) The material used for this product is metal, plastics and synthetic rubber.
   Do not burn the product; take appropriate measures as an industrial waste.

8. Internal structure and parts list



Parts list

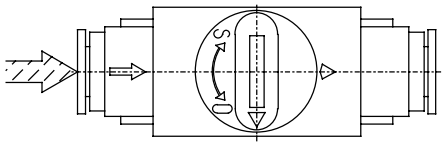
No.	Parts name	Meterial
1	Rotary shaft	Polybutylene terephthalate (Equivalent to standard UL94V-0)
2	Stopper	Brass (Electroless nickel plating) ※1
		Stainless steel ※2
3	Ring	Steel
4	O-ring	NBR
5	Nipple	Brass (Electroless nickel plating)
6	O-ring	NBR
7	Packing seal	NBR
8	Chuck holder	Polyethersulfone
9	Chuck	Stainless steel
10	Outer ring	Brass (Electroless nickel plating)
11	Push ring	Polybutylene terephthalate (Equivalent to standard UL94V-0)
12	Main body	Polybutylene terephthalate (Equivalent to standard UL94V-0)

※1: Material of models that applies the bracket 2QV-P1
※2: Material of models that applies the bracket 2QV-P2

9. Description of action

- 2-port valve (2QV Series)

<Closed state>



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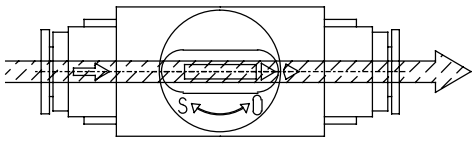

- 3-port valve (3QV Series)

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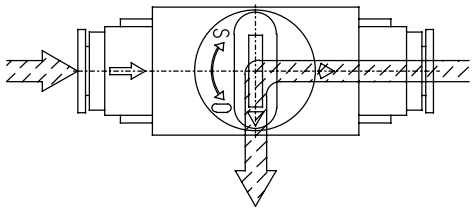

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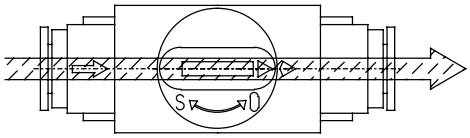

10. Specifications of product

10.1 Model number

- Quick valve

2QV – 04-04

(a) (b)

(a) Model name		(b) Port size (P port) - (A port)				Special bracket *
Symbol	Valve type		Inlet side	-	Outlet side	
2QV	2-port valve	04 - 04	Push in joint ϕ4	-	Push in joint ϕ4	2QV - P1
3QV	3-port valve	06 - 06	Push in joint ϕ6	-	Push in joint ϕ6	
		08S - 08S	Push in joint ϕ8	-	Push in joint ϕ8	
		08 - 08	Push in joint ϕ8	-	Push in joint ϕ8	2QV - P2
		10 - 10	Push in joint ϕ10	-	Push in joint ϕ10	
		12 - 12	Push in joint ϕ12	-	Push in joint ϕ12	
		6A - 04	R1/8	-	Push in joint ϕ4	2QV - P1
		6A - 06	R1/8	-	Push in joint ϕ6	
		8A - 06	R1/4	-	Push in joint ϕ6	
		8A - 08S	R1/4	-	Push in joint ϕ8	
		10A - 08	R3/8	-	Push in joint ϕ8	2QV - P2
		10A - 10	R3/8	-	Push in joint ϕ10	
		15A - 10	R1/2	-	Push in joint ϕ10	
		15A - 12	R1/2	-	Push in joint ϕ12	
		04 - 6A	Push in joint ϕ4	-	R1/8	2QV - P1
		06 - 6A	Push in joint ϕ6	-	R1/8	
		06 - 8A	Push in joint ϕ6	-	R1/4	
		08S - 8A	Push in joint ϕ8	-	R1/4	
		08 - 10A	Push in joint ϕ8	-	R3/8	2QV - P2
		10 - 10A	Push in joint ϕ10	-	R3/8	
		10 - 15A	Push in joint ϕ10	-	R1/2	
		12 - 15A	Push in joint ϕ12	-	R1/2	
		6A - 6A	R1/8	-	R1/8	2QV - P1
		8A - 8A	R1/4	-	R1/4	
		10A - 10A	R3/8	-	R3/8	2QV - P2
		15A - 15A	R1/2	-	R1/2	

* The bracket is common for the two- and three-port valves.

* Varies according to the body size. Be careful.

10.2 Specifications of product

Model number / Item		2QV/3QV
Working fluid		Air
Max. working pressure	MPa	1.0
Min. working pressure	kPa	-100 (Note 1)
Proof pressure	MPa	1.5
Fluid temperature	℃	0 to 60
Ambient temperature	℃	0 to 60
Changeover angle	°	90
Tube		Soft nylon tube (Tube F-15xx) Urethane tube (Tube U-95xx, NU-xx)

Note 1: Use the insert ring when using the valve with the urethane tube (U-95xx, NU-xx) in a vacuum.

Note 2: We cannot meet requirements for oil proof treatment specification because lubricant is used.