

CKD

INSTRUCTION MANUAL FOR Manual valve for high vacuum

MVB *17

- Before using this product, thoroughly read this instruction manual.
- In particular, read the safety precautions carefully.
- After reading this instruction manual, keep it in a safe place where all concerned personnel can refer to it immediately.

CKD Corporation

Safe Usage of Our Products

Our products are varieties of control valves such as solenoid valves, electric actuator valves and air operated valves and are designed to be used by people who have a basic knowledge of materials, fluids, piping, electricity and the like. We shall accept no responsibility for accidents caused by incorrect selection or usage of our products by people who have no knowledge of, or who have not undergone sufficient training with respect to these products.

The applications for which our customers put our products to use are many and varied and so therefore, it is not possible for us to provide details that cover all such applications.

Depending on the applications or the usage methods, there have been cases where it has not been possible to demonstrate the performance of products and accidents have occurred due to conditions such as the flow medium or piping. Accordingly, it is the customer's responsibility to decide how the product shall be used and to check the products' specifications in accordance with the customer's applications and the usage methods of the products.

While these products are equipped with various safety features, there may be accidents due to the customer's incorrect handling of the products.

To avoid such accidents, it is strongly advised that the instruction manual be thoroughly read and understood prior to using the product.

In addition to the handling precautions outlined in the main instructions manual, caution should also be exercised in regards to the following points.

Thank you for purchasing the CKD manual valve for high vacuum [MVB Series].
The MVB Series is an manual valve developed with years of experience to
Enable use in a variety of fields by many users.

CKD products are manufactured under strict quality control. Please read this instruction
manual to use the CKD product efficiency.
Refer to the latest specification drawings and specifications for details
on the inner structure, part lists and specifications.

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1. Safety Precautions

When designing and manufacturing devices using the CKD products, the manufacturer has an obligation to check that the safety of the device's mechanical mechanism, pneumatic control circuit or water control circuit, and the system operated by the electrical control that controls these circuits is secured. It is important to appropriately select, use, handle and service the product to ensure that the CKD product is used safely. Always observe the warnings and cautions to ensure the safety of the device.

Check that the safety of the device can be ensured, and manufacture a safe device.



WARNING

1. This product is designed and manufactured as a device and part for general industrial machines. This product must be handled by a well versed and skilled operator.

2. Use the product within the working range.

This product cannot be used outside the product's characteristic specifications. Never modify or additionally machine this product. This product is intended for use in general industrial machines and parts. It is not intended for use outdoors, or under the following types of conditions or environments.

- i. Use for special applications requiring safety including nuclear energy, railway, aircraft, ship, vehicle, medical devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press clutches, brake circuits or safety devices.
- ii. Use for applications where human life or assets could be greatly affected, and special safety measures are required.

3. Always observe association standards and regulations, etc., related to the safety of device design and control, etc.

ISO 4414, JIS B 8370 (pneumatic system rules)
JFPS2008 (pneumatic cylinder selection and usage policy)
Occupational Safety and Sanitation Laws, and other safety rules, association standards and regulations.

4. Never handle, pipe or remove the devices before confirming the safety.

- i. Always inspect and service the machine and devices after confirming the safety of the entire system related to this product.
- ii. Note that there may be hot sections or charged sections even when operation is stopped.
- iii. When inspecting or servicing the device, always cut off the energy source (air supply or water supply), and cut off the power to the relevant facility. Discharge any compressed air from the system, and pay special attention to water leaks and electricity leaks.
- iv. When starting or restarting a machine or device that incorporates pneumatic devices, make sure that the system safety, such as the popping out prevention measures, is secured.

5. Always observe the following warnings and cautions to prevent accidents.

- The safety precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.



DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency or urgency to a warning.



WARNING: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.



CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation.

In any case, important information that must be observed is explained.

Liability

1. CKD shall not be held liable for any business interruption, loss of profit, personal injury, delay costs, or any other ancillary or indirect loss, costs, or damage resulting from the use of or faults in the use of CKD products.
2. CKD shall not be held responsible for the following damage.
 - i. Damage resulting from disaster or failure of CKD product due to fire from reasons not attributable to CKD, or by intentional or negligence of a third party or customer.
 - ii. When a CKD product is assembled into customer equipment, damage that could have been avoided if customer equipment was provided with functions and structure, etc., generally accepted in the industry.
 - iii. Damage resulting from use exceeding the scope of specifications provided in CKD catalogs or instruction manuals, etc., or from actions not following precautions for installation, adjustment, or maintenance, etc.,
 - iv. Damage resulting from product modifications not approved by CKD or from faults due to combination with other software or other connected devices.

2. Warnings and Precautions for Use



WARNING

2-1. Design and Selection

Incorrect device selection and handling will result in product trouble and may cause trouble in the customer's system. Always make sure that this product's specifications and the customer's system are compatible.

i. Do not use for emergency shut-off valve.

This product is not designed as a valve to ensure safety such as an emergency shut-off valve. When using in that type of system, always provide other measures to accurately ensure safety. Incorrect device selection and handling will result in product trouble and may cause trouble in the customer's system. Always make sure that this product's specifications and the customer's system are compatible.

ii. Working fluid

This product is designed to control vacuum or inert gas. If other fluids (active gas, fluids, solids, etc.) are passed, the product's proper operation may be disrupted, or the performance could drop. Always check the compatibility of the wetted section material and working fluid before starting use. If the working fluid could solidify, make sure that there will be no problems in use before starting. If the working fluid could solidify, make sure that there will be no problems in use before starting. Avoid using fluids which will cause crystals to accumulate in the piping. Internal leaks could occur or the bellows could be damaged.

iii. Fluid quality

If dirt or foreign matter gets in the fluid, fluid could leak from the valve seat, and a satisfactory performance may not be attained. Take measures by providing a filter on the primary side, etc.

iv. Fluid temperature

Observe the fluid temperature given in the specifications. Using fluid exceeding the specifications could result in leaks or operation faults.

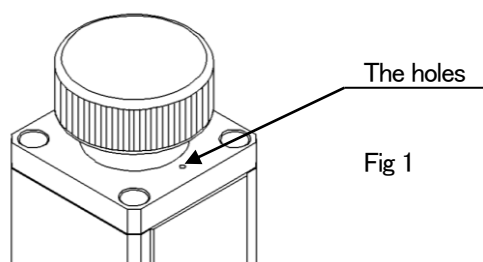
v. Ambient condition

- Confirm the compatibility of the product's configuration materials and ambient atmosphere before starting use.
- Observe the ambient temperature and ambient humidity given in the specifications. Use exceeding the specifications could result in leaks or operation faults.

vi. Selection

The inside of the bellows are directly connected to the atmosphere. Make sure that the holes (hole under the handle) connecting the inside of the bellows and the atmosphere are not plugged. (Fig 1)

vii. Provide sufficient measures so that humans or objects are not adversely affected should this product fail.



2-2. Installation and Adjustment



WARNING

Incorrect installation and piping result in product trouble, may cause trouble in the customer's system, and may result in death or serious injury. The customer is responsible for making sure that the system is operated by someone who understands the system and has read the instruction manual thoroughly. After installing the product, carry out an adequate function test and confirm that the installation state is correct.



CAUTION

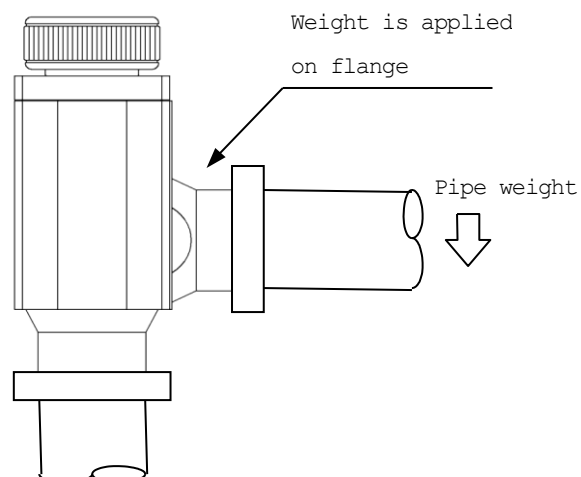
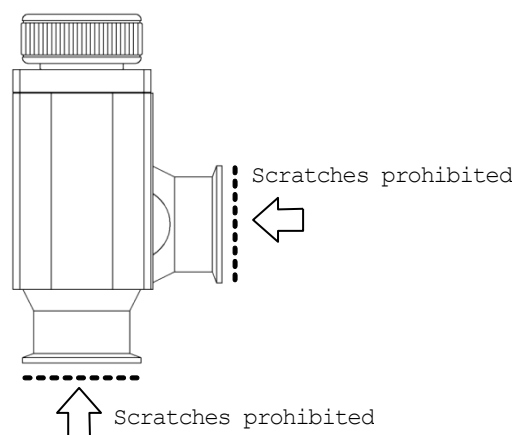
- This product is assembled in a clean room after precision cleaning. Always open the clean pack in the packaging box in a clean environment just before installation.
- The durability could drop if this product is used where there is continuous vibration. Pipe the product so that excessive vibration and impact are not applied.

i. Securing space

1. Secure enough space for installation, removal, piping and wiring work.
2. Because the full length of the product rises when a valve opened, please be careful enough.

ii. Main piping

1. Dirt or burrs in the piping or during the piping work could damage the valve seat or O ring seal, and cause leaks. Always remove all dirt and burrs before installing the valve.
2. Pipe so that any tension, compression or bending, etc., caused by the pipe is not applied on the valve body.
3. Clean the vacuum flange's seal face and the center ring's O ring with ethanol, etc., before installing.
4. There is a 0.1 to 0.2mm step (indented shape) on the vacuum flange face to protect the seal face. Handle this part carefully so that the seal face is not scratched, etc.
5. The durability could drop by the flow of exhaust, so the bellows side should be used as the exhaust side. The durability differs according to the working conditions, so check the situation carefully.
6. Always carry out a leak inspection after completing the piping work, and make sure that there are no leaks.



2-3.Using the Product

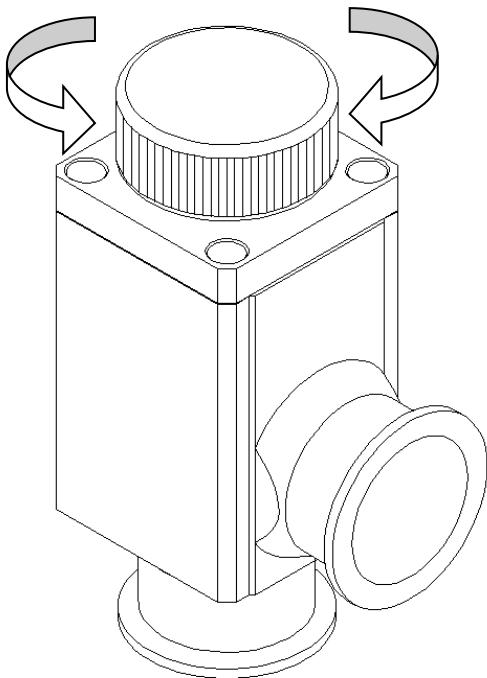
**WARNING**

- Use this product within the specified range. Refer to the product's latest specifications and specification drawings for details on the specified range.

**WARNING**

- Do not use the valves, etc., as footing or place heavy objects on them.
- Closing the handle is too tight may lead to damage the valve.
- When the handle of the valve is turned to the closing direction, the turning force suddenly drops near complete shut.

The sealing force for the valve comes from the spring, and is no problem of closure capacity.



Please don't turn the handle excessively !

It causes the valve trouble to turn too much.

3. Maintenance and Inspection

3-1.Periodic Inspection



WARNING

- i. Always follow the instructions given in the instruction manual.
- ii. Always turn the power OFF and release the operation air, fluid and pressure before starting. Do not touch the live sections with wet hands. There is a risk of electric shock.
- iii. Before replacing the valve, sufficiently purge out the residual gas in the valves and piping with inert gas, etc., so that devices and people in the area are not affected.
- iv. Carefully remove all dirt and burrs before installing the valve.
- v. After completing the work, always carry out a leak inspection and confirm that there are no leaks.
- vi. Do not disassemble the product. The product warranty will be invalid once the product is disassembled.
- vii. Periodic inspection
- viii. To ensure the product is used in the optimum state, carry out a periodic inspection (confirmation of operation, leak check, etc.) once or twice a year.
- ix. Inspection items
 - Leaks outside of the valve
 - Leaks from the valve seat (internal leaks)
 - Smooth valve operation
 - Loosening of screws at pipe or valve
 - O ring wear or corrosion

3-2.Warning on Disassembly



WARNING

Avoid disassembling the manual valve for high vacuum. The valve's performance cannot be guaranteed if the valve is reassembled by the customer.

Contact CKD or your dealer if the valve is inadvertently disassembled or if any other problem occurs.

4. How to Order

MVB 4 1 7 - 40K

Model

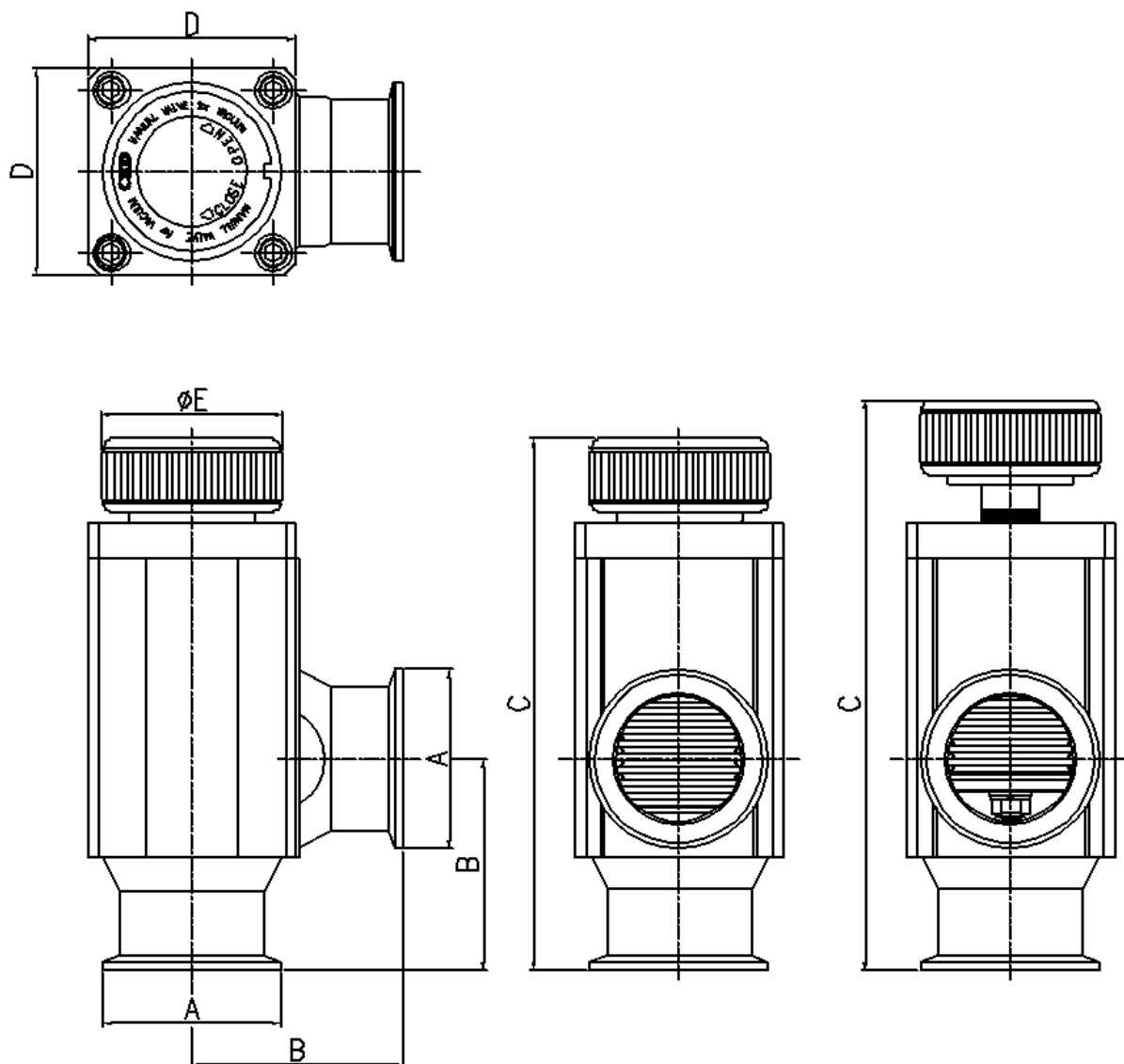
A Series

B Connection Method

Symbol	Details	
A Series		
2	Orifice ϕ 17	
3	Orifice ϕ 24	
4	Orifice ϕ 39	
5	Orifice ϕ 48	
B Connection Method		
16K	NW16	Available only for MVB217
25K	NW25	Available only for MVB317
40K	NW40	Available only for MVB417
50K	NW50	Available only for MVB517

5. Dimensions

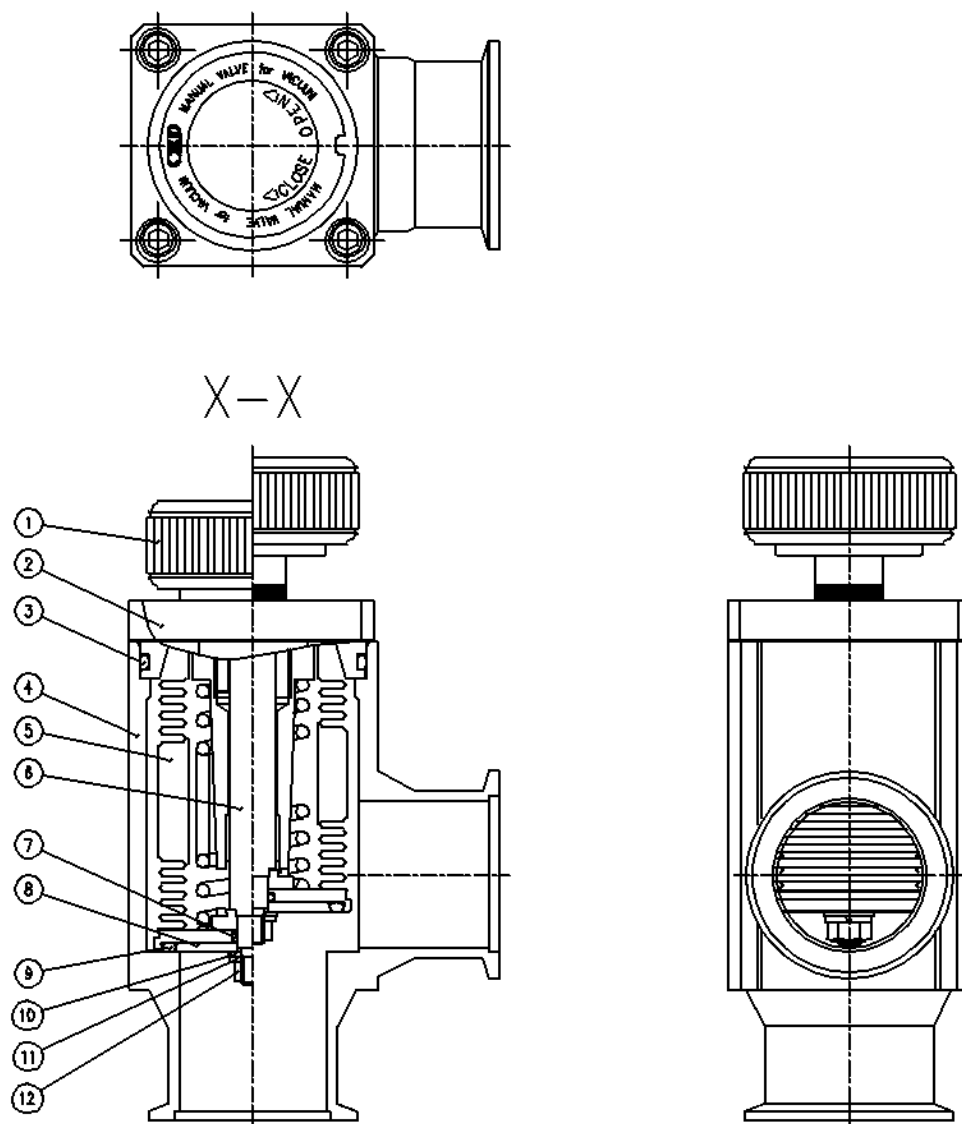
MVB※17-※※K



MODEL	A	B	C		D	E	Weight [kg]
			valve open	valve close			
MVB217-16K	φ 30(NW16)	40	115	121	40	32	0.4
MVB317-25K	φ 40(NW25)	50	127	134	45	38	0.6
MVB417-40K	φ 55(NW40)	65	164	176	64	56	1.4
MVB517-50K	φ 75(NW50)	70	178	193	77	69	2.3

6. Internal Structure

MVB※17-※※K



art No.	Part name	Material	Qty	Remarks
1	Handle	SUS303 A5056	1	
2	Adapter	A5056	1	
3	O ring	FKM	1	
4	Body	A6063	1	
5	Bellows assembly	SUS316L	1	
6	Rod	SUS316L	1	
7	O ring	FKM	1	
8	Valve disk B	SUS316L	1	
9	O ring	FKM	1	
10	Flat washer	SUS304	1	
11	Spring washer	SUS304	1	
12	Hexagon nut	SUS304	1	