CKD

SM-6959-A/1

INSTRUCTION MANUAL

MOTOR VALVE

MHB – 32~50 – 210

- 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.

CKD Corporation

FOR SAFETY USE

The Product is to be used by those who has a basic knowledge about material, fluid, piping electricity regarding Control Valves (solenoid valves, motor valves, air operated valves and so on.)

Never use this Product by those who have no knowledge or are not well trained about Control Valves.

Should be any trouble or accident caused by a wrong selection and/or wrong use of the Product even by a person of basic knowledge about Control Valves, we are not responsible therefore.

Since any customer of the Product have a variety of its application, we are not in a position to get all the information on how and where the Product is used. There may be the cases where that the Product may not meet customers' requirement or may cause any trouble or accident, by fluid, piping or other condition that are not within the specifications of the Product.
Under such a circumstance, select with their responsibility the most suitable application and use of the Product according to the customers' requirements.

The Product incorporates a various safety arrangement, however miss-handling of the product may lead to any trouble or accident on customers side. To avoid any possible trouble, read this INSTRUCTION MANUAL carefully and understand it fully.

Pay your attention to the items described in this Text, as well as the items indicated below.

⚠ CAUTIONS

- When energized, heat is generated at coil portion of solenoid valves and motor valves particularly "Class H" coil where may have a high temperature.

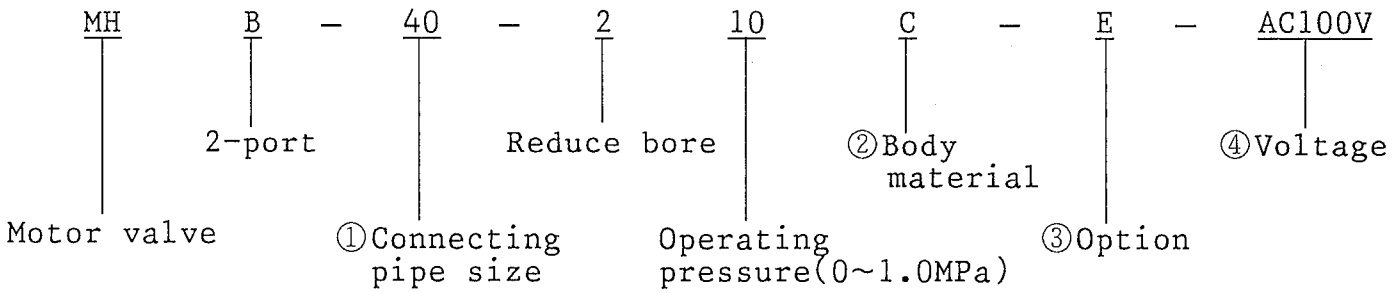
- There my have electric shock when wire connecting portion of solenoid valves or motor valves are touched. In case of disassembly or inspection, turn off power supply beforehand. Don't touch live portion by wet hands.

- Make piping so as not to have leakage and check for no leakage before use, because in case of control valves for high temperature fluid like steam, leakage may cause heat injury.

Thank you very much for adopting CKD motor valve (MHB-type).
All CKD products are manufactured under strict quality control system to ensure their safety and effectiveness.
Read this Instruction Manual thoroughly in order to use your CKD products more effectively.

CONTENTS

1. How to Read the Model No.



①Connecting pipe size	
32	Rc 1 1/4
40	Rc 1 1/2
50	Rc 2

②Body material	
No code	BC6
C	SCS13 (SUS304considerable)

③Option	
No code	Standard
E	Signal take off connection

④Voltage
AC100V
AC200V

2. Description of Function
and Internal structure and Parts list

2-1. Description of Function(Standard)

(1) "OPEN" function

(FULL CLOSE → FULL OPEN)

※ Shows the end of CLOSE function

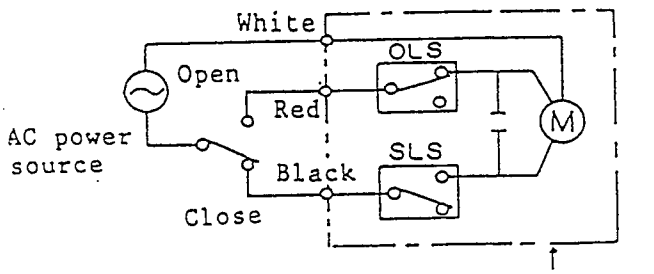


Fig.1

On turning the operating switch to OPEN from the state in Fig.1,the current flows between the white lead wire and the red lead wire, the output shaft rotates counterclockwise (when the valve is seen through the cover top). The cam turns off the contact of OLS to OPEN the valve, causes the motor to stop.
(See Fig. 2)

(2) "CLOSE" function

(FULL OPEN→ FULL CLOSE)

※ Shows the end of OPEN function

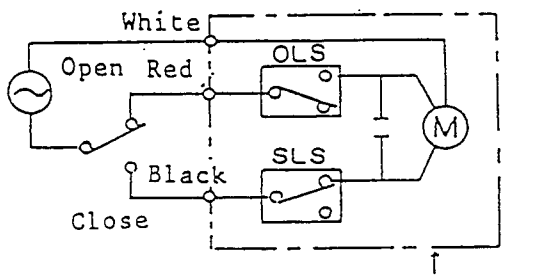


Fig.2

On turning the operating switch to CLOSE from the state in Fig.2,the current flows between the white lead wire and the black lead wire, causing the output shaft rotates clockwise (when the valve is seen through the cover top)
The cam turns off the contact of SLS to CLOSE the valve, causes the motor to stop. (See Fig. 1)

(3) During OPEN/CLOSE functions

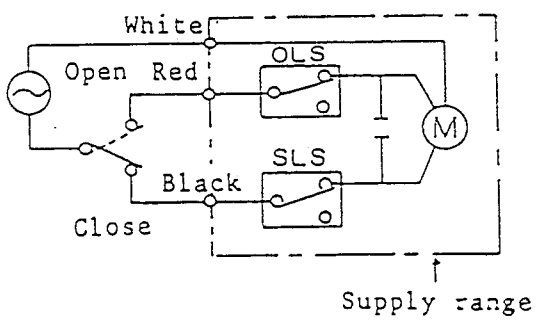


Fig.3

In the case OLS and SLS get set to COM-NC irrespective of the open/close signals, causing the output shaft to rotate according to the respective signals.
Here, don't make the reverse action during the motion, because the gears are broken down. (See Fig. 3)

2-2. Description of Function
(Option : E (Signal take off connection))

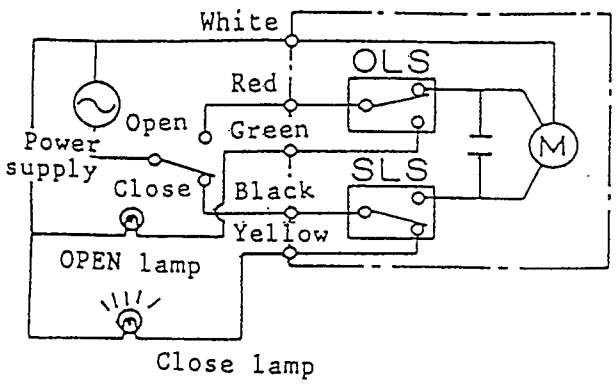
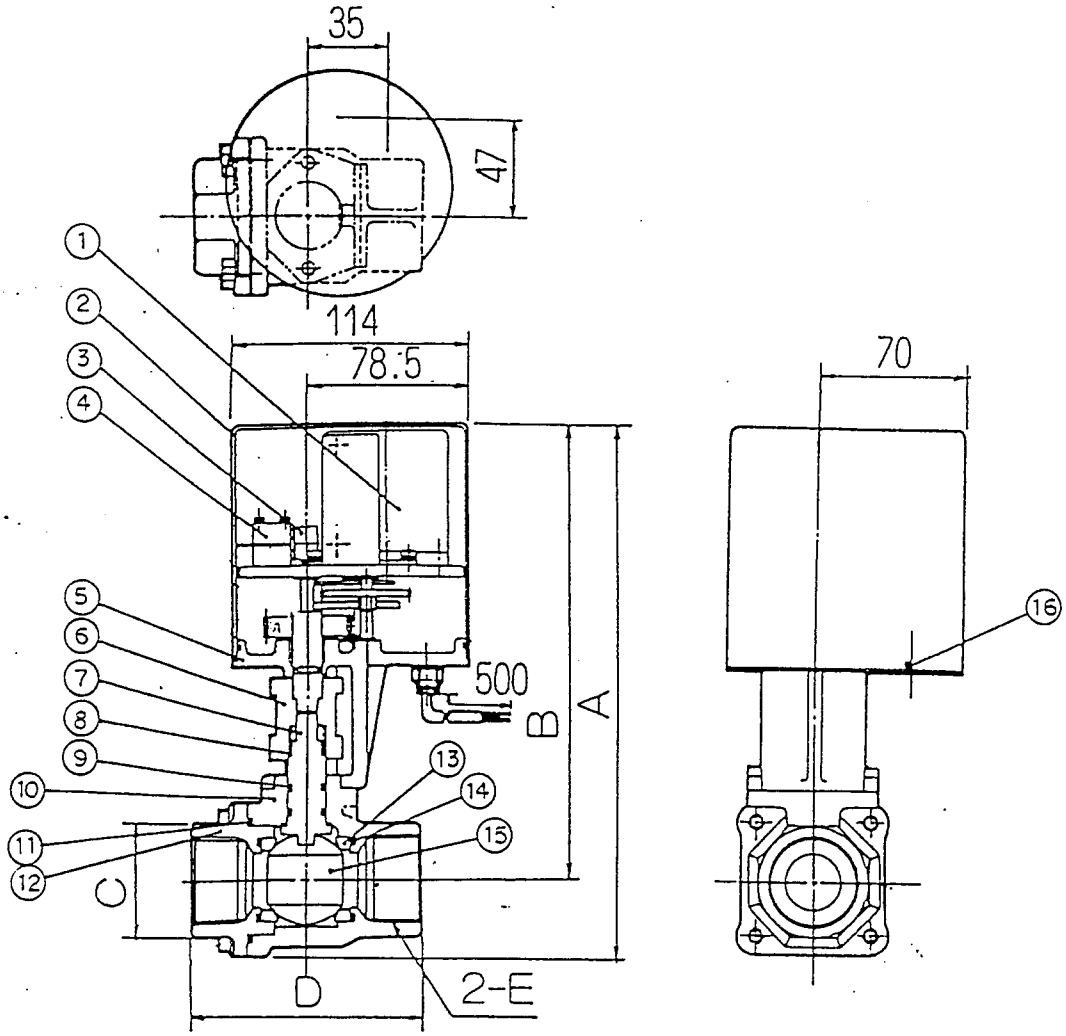


Fig.4

On connecting the wire as Fig. 4 in option : E (Signal take-off connection) ,OPEN lamp lights when "OPEN" function ends (FULL CLOSE → FULL OPEN).
CLOSE lamp lights when "CLOSE" function ends (FULL OPEN → FULL CLOSE).
Here, other components can be moved, setting relay in the substitution of lamp.

2-3. Exteral dimentions and internal structure



Model	A	B	C	D	E
MHB-32-210	255	218	54	110	Rc 1 1/4
MHB-40-210	266	222	60	120	Rc 1 1/2
MHB-50-210	276	228	74	140	Rc 2

Thing number	Parts name	Materials	Thing number	Parts name	Materials
1	Motor		9	O-ring	FKM
2	Bonnet	SPCC	10	Body	BC6
3	Cam	C3604	11	O-ring	FKM
4	Micro switch		12	Cap	BC6
5	Adaptor	AC7A	13	Valve seat	PTFE
6	Cup-ring	SUS303	14	O-ring	FKM
7	Shaft	SUS303	15	Valve ball	SUS304
8	Spring	SUS304WP-B	16	Cross headed pan small screw	SUS304

3. Cautions

3-1. Cautions for handling

(1). Avoid using in the atmosphere of explosive gas, corrosive gas, etc.

(2). Do not put heavy things or step on the drive section(unit).

(3). Use within the specified limit of ambient temperature and fluid temperature.

(4). Be sure to observe the operating pressure range and the activating frequency.

(5). Intrusion of solid substances into the valve may damage the valve ball, valve seat and packing(o-ring) , causing internal leakage and external one. So, instal strainer (80 mesh or more) foward of valve. Eliminate such substances before they enter the valve.

3-2. Cautions for piping

(1). Install the valve either in vertical or in horizontal position, with the motor unit at the top. Note that the drip-proof property of the valve is effective only for vertical installation.

(2). Carry out piping in the manner shown in the Fig 5.

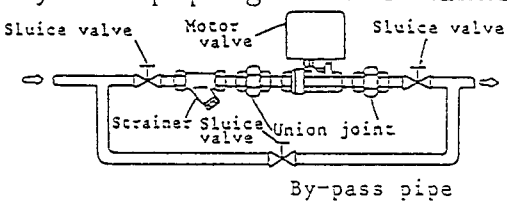


Fig.5

Use union joint or flange joint, and add by-pass piping for easy maintenance and inspection.

(3). Thoroughly remove the foreign substances such as dust, scale, etc. from the pipe line before installing the motor valve. Carry out thorough flushing, since the chips, weld wastes, etc. during piping get caught in the valve seat in the initial stage, causing leakage.

(4). Fix and suspend the pipe firmly, so that the weight and vibration of pipe may not fall directly on the valve.

(5). At places likely to cause the fluid to freeze, take appropriate measure such as warming, etc. in order to prevent freezing.

(6). Provide sufficient space to disassemble for maintenance and inspection. Particularly, Keep the space of 300mm or more on the top of valve, 200mm or more around one, to enable easy removal of the bonnet.

(7). After piping, check the joints for leakage.

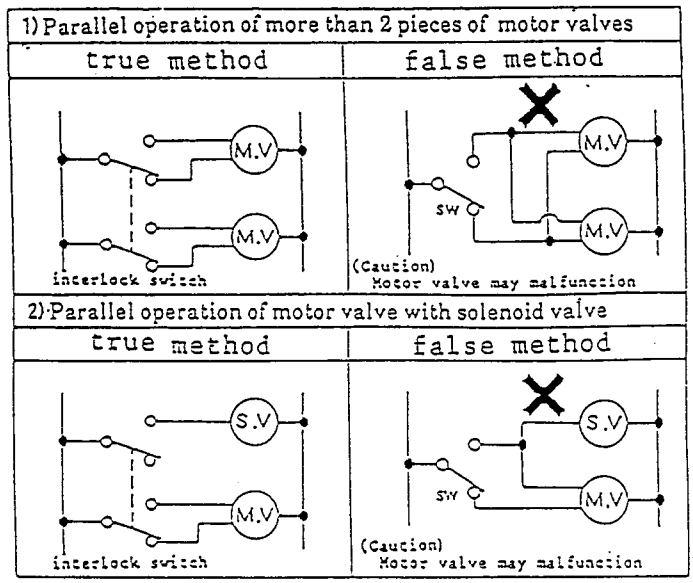
3-3. Cautions for wiring

(1). See to it that the input voltage is within the range of rated voltage ±10%. The valve can be operated both at 50Hz and 60Hz.

(2). Make connection as shown in the" Connection Diagram" attached to the cover.

(3). When using more than 2 pieces of valves, use relays, etc. to prevent parallel operation.(Fig.6)

(4). Refrain from using the red and black lead wire select switch, likely to cause the input of signals simultaneously.



M. V : Motor valve

S. V : Solenoid valve

Fig. 6

4. Inspection and Maintenance

4-1. Periodical inspection

(1). Carry out periodical inspection, normally once every six months, in order to use the motor valve at optimum state.

(2). Make inspection of the following items

(a). Check to see that there is no abnormal noise or abnormal heat at the time of valve operation.

(b). Check the bolts for slackening.

(c). Check to see that the power cables are not worn out.

(d). Check the valve for internal or external leakage.

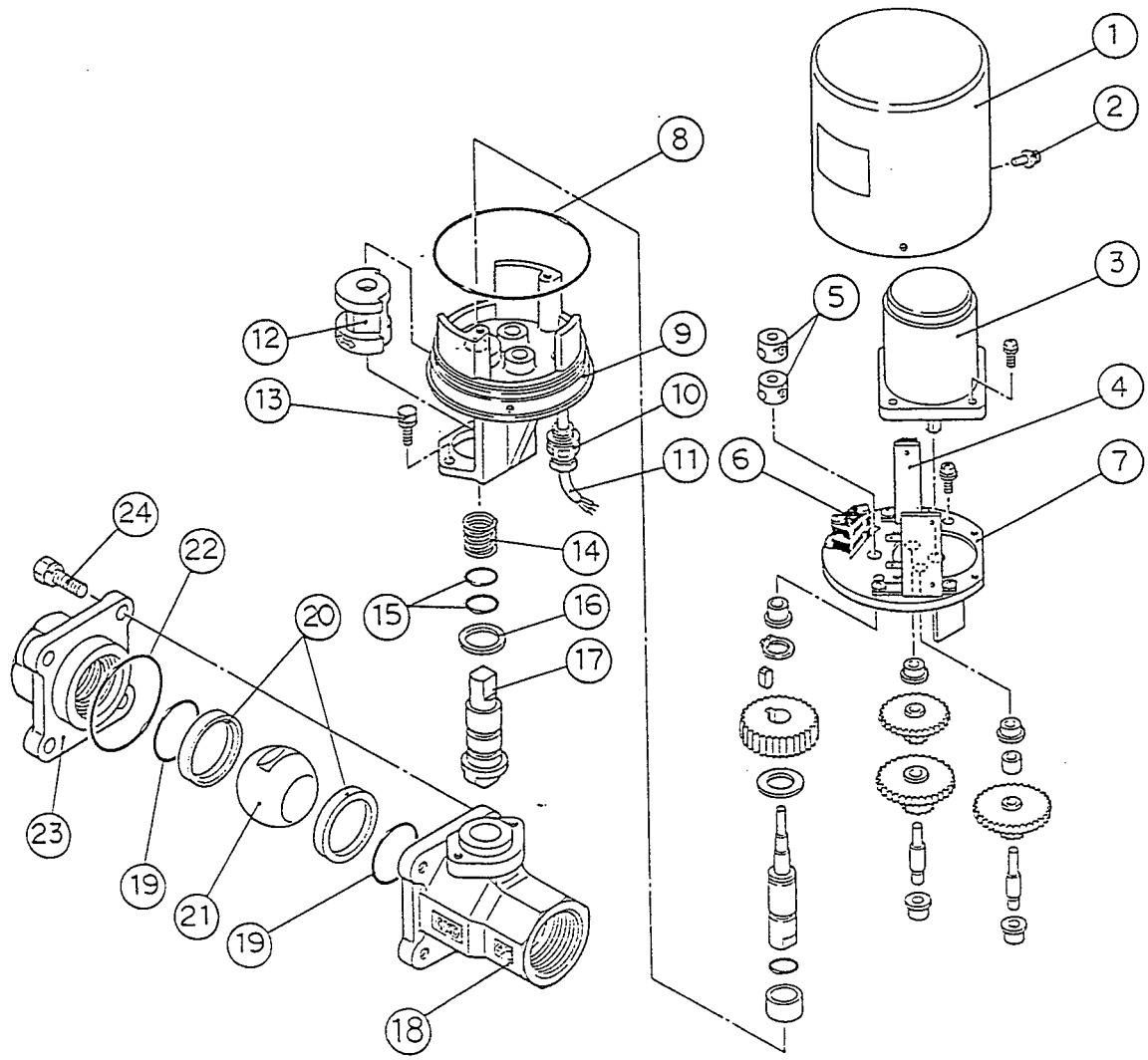
(3). Cautions for inspection

(a). Be sure to turn the power off before inspection.

(b). After inspection, be sure to carry out megger test to confirm the insulation.

(c). In case the valve is not operated over a long period, carry out idling periodically to check for abnormalities.

4-2. Replacement



Parts name

① : Bonnet	⑨ : Bracket	⑰ : Shaft
② : Cross headed pan small screw	⑩ : Super rock	⑱ : Body
③ : motor	⑪ : Cabtyre cable	⑲ : O-ring
④ : Terminal stand	⑫ : Cup-ring	⑳ : Valve seat
⑤ : Cam	⑬ : Hex. head bolt	㉑ : Valve ball
⑥ : Micro switch	⑭ : Spring	㉒ : O-ring
⑦ : Plate	⑮ : O-ring	㉓ : Cap
⑧ : O-ring	⑯ : Spacer	㉔ : Hex. head bolt

(1). Before disassembly, set valve ball ㉑ to semi-open state, and check to see that there is no internal pressure between valve ball ㉑ and body ⑱.

(2). Then turn the valve fully close before turning off the power to the valve.

(3). Fix the octagonal width across flates of body ⑱, and remove Hex.head bolt ㉔ by rotating counterclockwise with a monkey spanner. Then cap ㉓ can be removed from body ⑱.

(4). Remove valve seats ⑳ from body ⑱ and cap ㉓, and check to see that the sections holding the seats have no corrosion or foreign substances adhered to them. Here, replace O-ring ⑲ if it has scratches or permanent strain. Then insert the new valve seat.

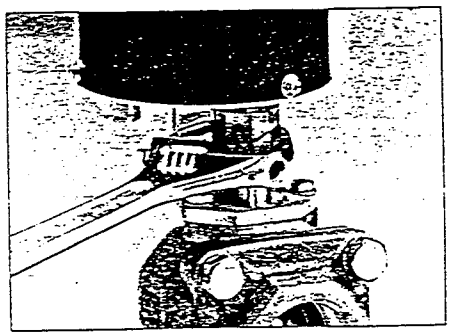
(5). Carry out assembly in the reverse order of disassembly.

(6). For inspection, first apply the electric signal to see that the valve operates normally for OPEN/CLOSE functions.

(7). Apply rated pressure, and set the valve to FULL CLOSE to check for internal leakage, then set valve ball ㉑ to SEMI-OPEN state to check for external leakage.

4-3. Manual operating method

Push down and turn the cup-ring by means of spanner , valve will operates independently.
(Reverse the cup-ring slitly with spanner will facilitate the cup-ring push down.)



4-4. Troubleshooting

In case the motor valve fails to function and does not meet the requirements, carry out inspectios according to the Table below.

TROUBLE	CAUSE	COUNTERMEASURE
Fails to activate	Power not ON	See the wire, fuse, and turn the power to ON
	Less than rated voltage	See the power and supply rated voltage
	Foreign substance caught in the valve	Check the inside of valve, and eliminate the cause. Replace the ball valve according to 4-2.Replacement
	Locking of valve seat	
	Simultaneous input of OPEN/CLOSE functions	Make reconnection to enable OPEN/CLOSE change-over
	Trouble in actuater	Replace the actuater according to 4-2. replacement
Valve activates, but fails to function normally (Actuater vibrates, or stops on the way)	Parallel operation of more than 2 units (valves)	Use relays,etc. to avoid parallel operation
	Reverse connection of OPEN and CLOSE	Make correct connection
	Foreign substance caught in the valve	Check the inside of valve, and eliminate the cause. Replace the ball valve according to 4-2.Replacement
	Locking of valve seat	
Motor moves, but valve fails to do	Damage, or life of gear-head	Check the inside of valve, and see foreign substance caught in the valve. Replace actuater when normal in the one, do valve when abnormal
Leakage	Foreign substance caught in the valve	Replace the ball valve according to 4-2. Replacement
	Wear of valve seat	
	Short time of current flow	Pass the current for the time longer than the time specified in the catalog

In case the trouble is serious and is difficult to settle, confirm the trouble(s) in the above Table, and inform the type size and fluid conditions to CKD or out dealers through the store at which you purchased the CKD product.