SM-5457-A/1

INSTRUCTION MANUAL

FOR

MOTOR VALVE

MHB – $\begin{matrix}15\\20\\25\end{matrix}$ – 25

Prior to using the Product, it is essential to read this INSTRUCTION MANUAL, especially the description of safety-use issue.

For quick reference whenever necessary, keep this INSTRUCTION MANUAL in a good manner.

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.

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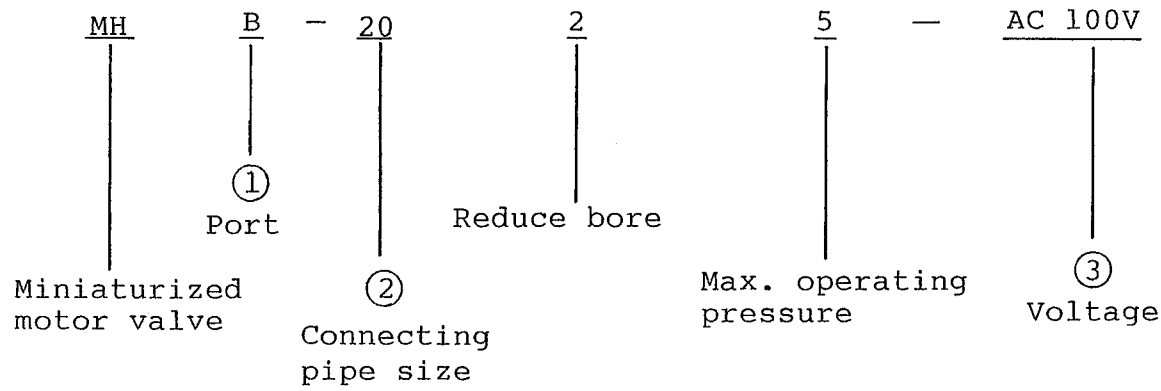
1. How to Read the Model No.



① Port	
B	2-port

② Connecting pipe size	
15	Rc 1/2
20	Rc 3/4
25	Rc 1

*: Rc is the same as PT

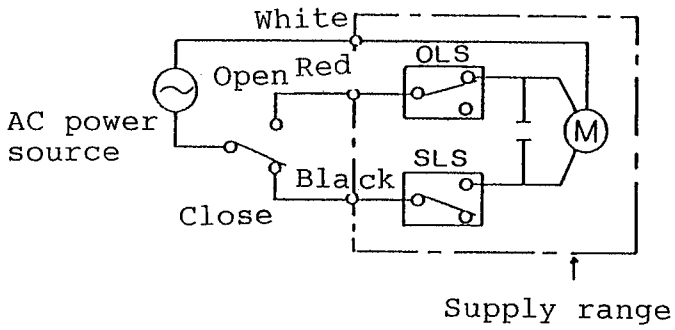
③ Voltage
AC 100V (50/60Hz)
AC 200V (50/60Hz)

2. Description of Function, Internal Structure, and List of Parts

2-1. Description of function

(1) "OPEN" function
(FULL CLOSE → FULL OPEN)

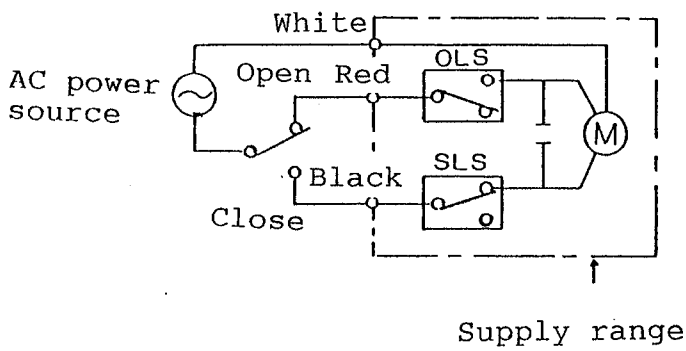
* Shows the end of CLOSE function



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, causing the motor to rotate counterclockwise (when the valve is seen through the cover top). This sets the output shaft to rotate and the cam to turn off the NC contact of OLS, causing the motor to stop. (See Fig. 2)

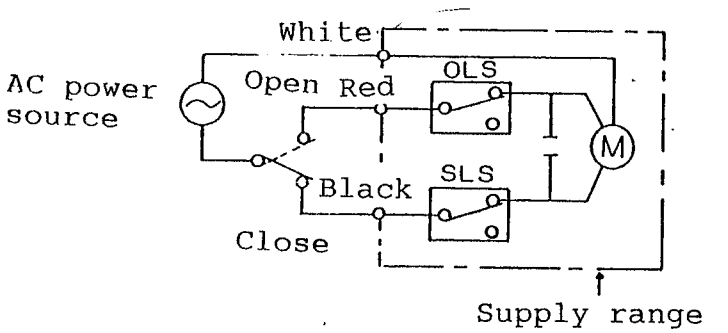
(2) "CLOSE" function
(FULL OPEN → FULL CLOSE)

* Shows the end of OPEN function



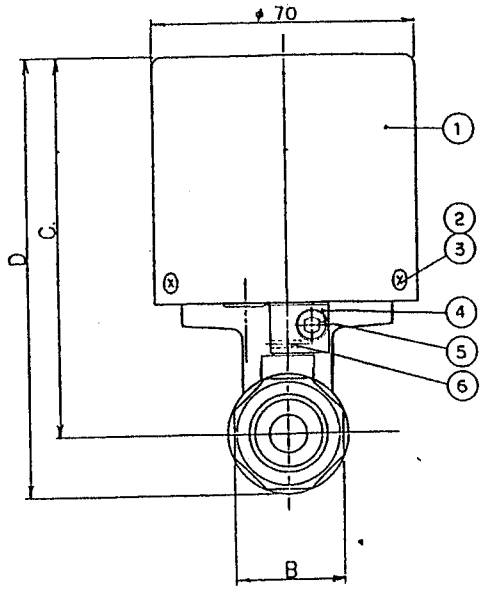
On turning the operating switch to CLOSE from the state in Fig.2, the current flows between the white lead wire and the black lead wire, causing the motor to rotate clockwise (when the valve is seen through the cover top). This sets the output shaft to rotate and the cam to turn off the NC contact of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

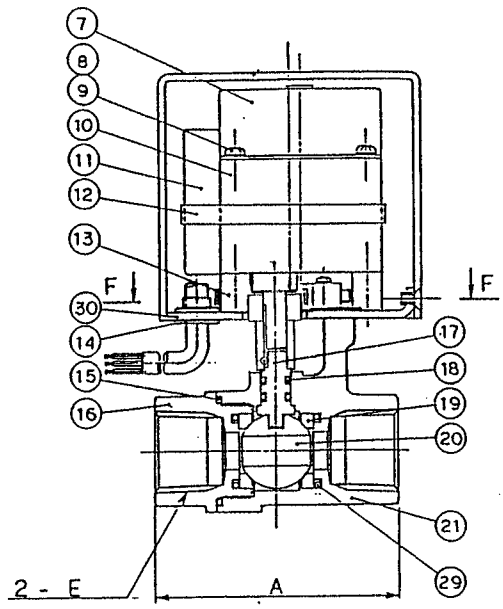
(3) During OPEN/CLOSE functions

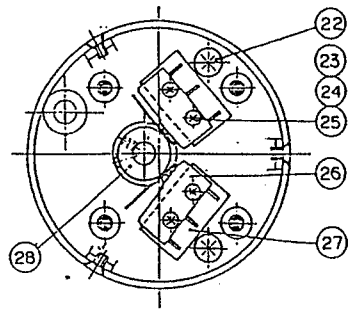


In this case OLS and SLS get set to COM-NC as shown in Fig.3, irrespective of the open/close signals, causing the output shaft to rotate according to the respective signals.

2-2. Internal structure, list of parts and external dimensions







断面 F - F

[Internal Structural Diagram]

Model name	A	B	C	D	E
MHB-15-25	65	29	100	116	Rc 1/2
MHB-20-25	80	35	104	124	Rc 3/4
MHB-25-25	92	44	107	131	Rc 1

[External Dimensions]

30	Base	SPCC	1	
29	"O" ring	FKM	2	
28	Cam ass'y	C3604BD	1	
27	Separator		2	
26	Microswitch		2	SS-5GL
25	Cross recessed pan head screws	SUS304	4	
24	Spring washer	SUS304	4	
23	Flat washer	SUS304	4	
22	Cross recessed pan head screws for setting spring washer	SUS304	2	
21	Body	BC6	1	
20	Valve bore	SUS304	1	
19	Valve set	PTFE	2	
18	"O" ring	FKM	2	
17	Shaft	SUS303	1	
16	Cap	BC6	1	
15	"O" ring	FKM	1	
14	Rubber bush	NR	1	
13	Collar	C2700T	4	
12	Band	PA-66	1	
11	Condenser		1	
10	Gear head		1	
9	Cross recessed pan head screw	SUS304	4	
8	Spring washer	SUS304	4	
7	Synchronous motor		1	
6	Parallel pin	SUS304	1	

NO	PARTS	MATERIAL	QTY	REMARK
5	Hexagon socket head cap screws	SUS304	1	
4	Bush	SS41	1	
3	Cross recessed counter sunk screw	SUS304	3	
2	Rubber spacer	NBR	3	
1	Bonnet	SPCC	1	

[List of Parts]

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.

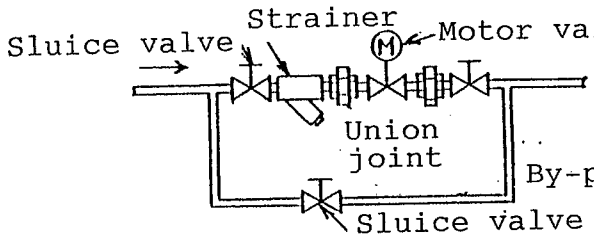
(5) Intrusion of solid substances into the valve may damage the valve bore, valve seat and packing ("O" ring), causing internal or/and external leakage. Hence, eliminate such substances before they enter the valve.

(6) Since the valve is for indoor use, refrain from using outdoor.

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. below.



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 for disassembly needed for maintenace and inspection. Particularly, keep the space of more than 200 mm over the cover to enable easy removal of the cover.

(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 50 Hz and 60 Hz.

(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.

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

4. Maintenace and Inspection

4-1. Periodical inspection (check)

(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.

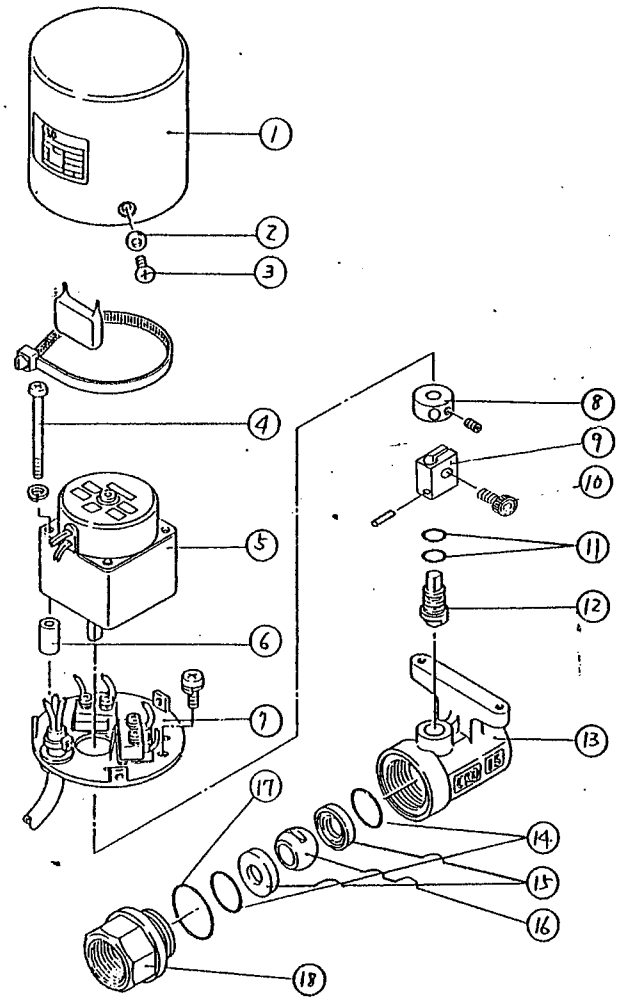
(3) Cautions for inspection.

(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. Disassembly, assembly and inspection at seat replacement



Parts Names

①	:	Cover
②	:	Rubber spacer
③	:	Cross recessed counter-sunk screw
④	:	Cross recessed pan head screw
⑤	:	Motor
⑥	:	Collar
⑦	:	Base
⑧	:	Cam ass'y
⑨	:	Bush
⑩	:	Hexagon socket head Cap screws
⑪	:	"O" ring
⑫	:	Shaft
⑬	:	Body
⑭	:	"O" ring
⑮	:	Valve seat
⑯	:	Bore
⑰	:	"O" ring
⑱	:	Cap

(1) Before disassembly, set bore ⑯ to semi-open state, and check to see that there is no internal pressure between bore ⑯ and body ⑬ .

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

(3) Fix the octagonal width across flates of body ⑬ , and remove cap ⑱ by rotating counterclockwise with a monkey spanner. Then bore ⑯ can be removed from body ⑬ .

(4) Remove valve seats ⑮ from body ⑬ and cap ⑱ , and check to see that the sections holding the seats have no corrosion or foreign substances adhered to

them. Here, replace "O" ring ⑭ 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 OPEN to check for internal leakage, then set bore ⑯ to SEMI-OPEN state to check for external leakage.

4-3. Troubleshooting

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

TROUBLE	CAUSE	COUNTERMEASURE
Fails to activate	Power not ON	Turn the power to ON
	Incorrect voltage	Supply rated voltage
	Disconnection of wire or/and broken fuse	Connect the wire or/and replace the fuse
	Foreign substance caught in the valve	Check the inside of valve, and eliminate the cause
	Locking of valve seat	
	Simultaneous input of OPEN/CLOSE functions	Make reconnection to enable OPEN/CLOSE change-over
	Trouble in micro-switch	Replace the microswitch
Valve activates, but fails to function mormally	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
	Locking of valve seat	
	Trouble in micro-switch	Replace the microswitch
Leakage	Foreign substance caught in the valve	Repair the valve (replace the valve seat, bore, etc.)
	Short time of current flow	Pass the current for the time longer than the time specified in the catalog
	Trouble in micro-switch	Replace the microswitch

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 our dealers through the store at which you purchased the CKD product.