IOM RAF U

Universal Control Valve

RAPHAEL VALVES INDUSTRIES

Sep-24

DESCRIPTION

The valve is a hydraulically operated, solenoid-controlled diaphragm valve type RAF.

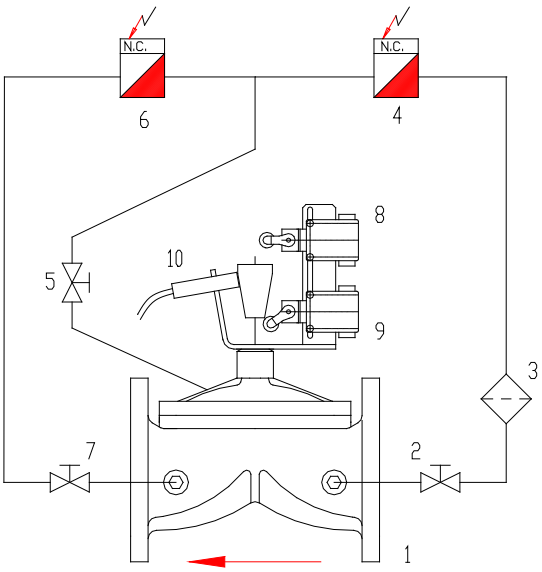
The valve operates automatically by a computer, maintaining any preset parameter (Flow rate, Pressure, Level etc.). The valve is commanded by two solenoid valves installed on the control loop. The electronic command system includes a transducer and PLC controller. The transducer sends its electronic signal, proportional to the actual required parameter to the controller which commands the valve solenoids.

INSTALLATION

- Before installing the valve, flush the pipeline to remove scale, dirt and other particles that might affect the valve's performance.
- Install the valve as indicated by the arrow on the valve's cover, showing flow direction.
- Make sure that the solenoid has the right specifications and connect it to the PLC.
- It is recommended to install isolation valves (butterfly valves type B7G) upstream and downstream the control valve.
- Check for leaks; tighten bolts & fittings if necessary.
- If you are using the factory supplied PLC (M-90 R1 or M-90 R1 CAN) see PLC installation instructions on next pages. If not refer to chosen PLC's installation manual for information.

PARTS LIST

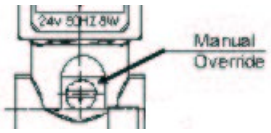
1. Body
2. Cock valve
3. Filter
4. 2-W N.C. solenoid
5. Cock valve
6. 2-W N.C. solenoid
7. Cock valve
8. Limit switch
9. Limit switch
10. 4-20 mA position indicator



OPERATING INSTRUCTIONS

Valve Automatic Operation

- Open Cock valve **2**.
- Close Cock valve **5**.
- Open Cock valve **7**.
- Open Cock valve **8**.
- PLC commands the solenoids to operate the valve. Solenoid **4** to close the valve and solenoid **6** to open the valve.
- Turn solenoid's manual override downwards.



Valve Manual Operation

To override the PLC command activating the solenoids manually:

- Turn solenoid **4** Manual override upwards to close the valve.
- Turn solenoid **6** Manual override upwards to open the valve.

To open the RAFU valve:

- Open Cock valve **5**.
- Close Cock valve **2**.
- Close Cock valve **7**.

To close the RAFU valve:

- Close Cock valve **7**.

To lock valve in Last Position:

- Close Cock valve **8**.

MAINTENANCE

- No regular maintenance is required; however, from time to time it is recommended to rotate the Cock valves and return to their position to prevent sticking by sediments. While the valve is off service, energize the solenoid from time to time for the same reason.
- It is recommended that the valve be easily accessible as well as clearly marked to prevent accidental damage.
- In freezing climates, the valve should be dismantled, and water drained during the winter months.

PROGRAM OPERATING RAF U

This program commands the valve operation. The program must be loaded to the controller prior to operation. Refer to M90 operation manual or annexed instructions for program downloading.

Display	Comment	Command
TYCO RAPHAEL:FC	Wait for next display or press "→".	→
Qmin### Qmax###	Enter minimum and maximum flow range in any engineering units. Maximum of 3 digits.	Enter
Qreq###	Enter flow set point. Make sure that units are the same.	Enter
Acc=%of(Qmx-Qmn)	This display states that the accuracy is a percentage of the subtraction of Qmax and Qmin.	
Accuracy+/- ##.#%	Enter required accuracy with decimal point if needed. Minimum accuracy is 2%.	Enter
Alarm Parameters	Display shows that you are at the Alarm parameters stage.	
Alarm time ##min	Enter alarm time in full minutes. If valve does not reach set point in Alarm time valve will go to the position chosen in next display.	Enter
Pos. O-1 C-2 L-3	Choose default positions at alarm: 1-Open, 2-Close, 3 –Last	1 or 2 or 3
Auto-→ Manual-←	Choose Auto or manual operation.	→ or ←
Flow up-↑ Down-↓	When choosing manual, displays explaining that in next display pressing and holding the button ↑ or ↓ will open or close accordingly.	
Qreq### Qa### M	Displays actual flow and set point. Press and hold ↑ to open the valve and ↓ to close the valve.	→ or ←
PID-1 CstTp/Td-2	When choosing Auto. Choose PID – Proportional Integral Derivative or CstTp/Td – Constant Time pulse/Time delay. When choosing 1 the display **Qreq### Qa###** appears.	1 or 2
Tp##.##S Td##S	Enter Pulse time (Tp) in ##.## format in seconds, and Delay between pulses (Td) in ## format in seconds.	Enter
Qreq### Qa###	Displays actual flow and set point. Pressing "→" displays **Sol"O"-#Sol"C"-#**, shows actual condition of the solenoids. Opening solenoid - 0 or 1 and Closing solenoid – 0 or 1 (0-Denergized 1-Energized). Pressing ↑ return to **Auto-→ Manual-←** display. Pressing ← displays **TYCO RAPHAEL:FC**.	
Alarm!V to ####	In Alarm situation the controller will show the valve's position according to the option chosen in display **Pos. O-1 C-2 L-3.** Pressing "0" returns to display **Qreq### Qa###**	0