



Liquid System Products

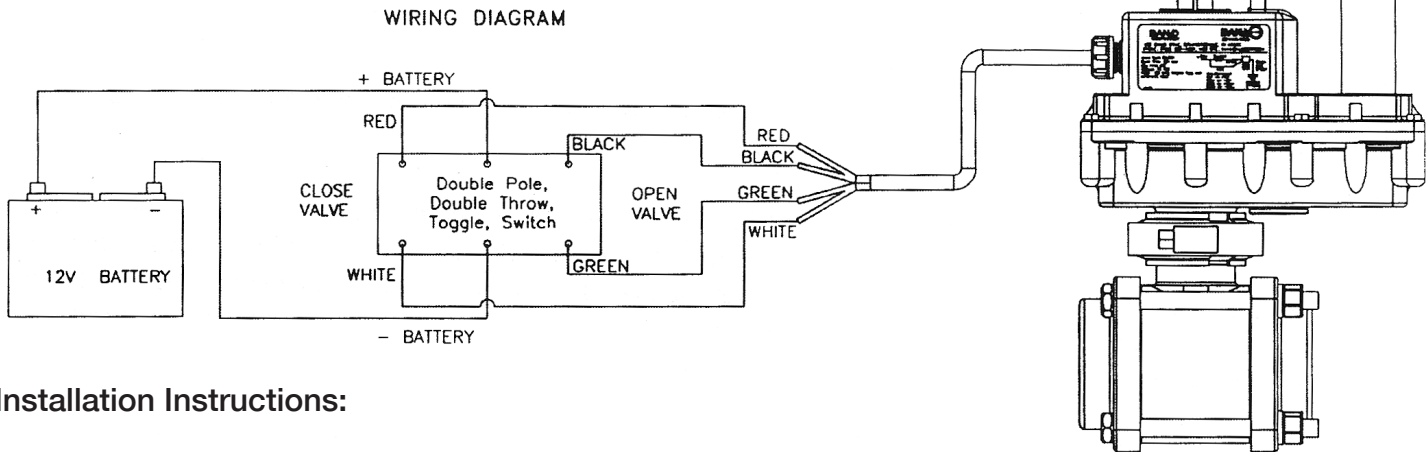
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Regulating Diagram



Installation Instructions:

1) Connect the valve to the liquid system:

When installing threaded connectors into the inlet and outlet of the valve, use a thread sealant compatible with the liquid that will be used in the system. Screw the connectors into the valve hand tight, then using a wrench, tighten the connectors an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn. For valves with the manifold flange fittings, place the gasket between the two flanges. While holding the two flanges together, install the metal clamp. Tighten the clamp down firmly.

2) Connecting the actuator to the electrical system:

A) 4 Wire: This type of actuator is generally used with a double pole, double throw (on/stop/off) switch. See diagram above. When the switch is turned to the On position the valve will open until the valves reaches full open or until the switch is moved to one of the other two positions. When the switch is moved to the middle, or Stop position, the valve will stop. When the switch is moved to the Off position, the valve will close until it reaches the full off position or until the switch is moved to a different position.

B) 2 Wire: This type of actuator is generally used with a controller that switches the polarity to the wires. The wiring has a red wire and a black wire. The valve functions as follows: Positive(+) to Red, Negative(-) to Black = Open and Positive(+) to Black, Negative(-) to Red = Closed. The valve will stop in either the full open or full close position depending on the polarity to the wires unless the power is shut off to the valve.

Valve Specifications:

Sizes: $\frac{3}{4}$ " through 2" Full Port
Connection: Threaded or Manifold Flanges
Material: Polypropylene TFE Seals, FKM/EPDM Body
O-Rings, FKM/EPDM Stem O-Rings, 304 SS
bolts & hardware, 316 SS Ball & Stem
Pressure: 150 PSI Max

Actuator Specifications:

Actuation Times: 4, 6, 8 Sec
Voltage: 12 VDC
Amp: 1.0 Max
Fuse: None

Troubleshooting:

The first thing to try is to hook the electric valve directly to the battery. This is done by taking the valve out of the wiring being used. Connect the valve directly to a 12-volt battery. The valve can be tested by placing the green and black wire on the negative terminal and the red wire on the positive terminal. When the white wire is touched to the positive terminal of the battery, the valve should open. When the white wire is lifted off the positive terminal, the valve should close. If the valve performs as stated, the valve is functioning properly and the problem is in the system wiring. If the valve does not function correctly (and the battery is not dead) then the problem is in the motor assembly and the valve has a problem. In most cases the problem is in the wiring, not the motor. In cases where the valve does have a problem, there are four common problems as detailed in the following:

1) *Motor does **not** run when switched. If when the switch is thrown, you cannot hear the motor running then the problem is either:*

A) Upper limit switch broken: This was caused by the valve being hooked up incorrectly (the red wire being wired negative(-) and the black wire being wired positive(+)) causing the valve to rotate the wrong way. When the switch was thrown the first time the ball rotated $\frac{3}{4}$ of a turn rather than $\frac{1}{4}$ of a turn, causing the backside of the cam to break the upper limit switch. If the limit switch is broken, you can shake the valve and hear parts rattling inside the housing. This cannot be fixed in the field. The cams have been modified so that if the ball rotates the wrong way the valve still won't open & close correctly, but no damage will occur to the valve.

B) Internal fuse tripped: The valve is calling for too much current, causing the poly fuse to trip. When this happens, the ball generally stops in a semi-open position. To reset the fuse, the red wire must be disconnected from the power source. The fuse trips when the valve has been over-tightened, or excessive abrasion or solids have made the valve so difficult to open and close that the motor draws too much current causing the fuse to trip. If the fuse keeps tripping, then the valve end plates need to be taken off to see what is causing the excessive current demand. Clean out any deposits and replace worn/damaged parts. Reassemble the valve and torque the bolts to 40 in-lbs (original factory setting). Repairs might require a little more torque to seal. If repairs are made, the current should be checked with an ohmmeter, with the maximum current spike of 3.5 amps. Again, this is a new valve value and might vary after the valve has worn in.

2) *Motor does run when switched. If when the switch is thrown, you can hear the motor running but the ball does not turn or does not open/close correctly then the problem is either:*

A) Bosses that hold motor in place have broken. The valve not opening and closing correctly indicates this. The screws holding the motor in place have broken the bosses and have allowed the motor to move inside the housing. You should be able to shake the valve back and forth and feel the motor moving inside the housing if this is the cause.

B) The shaft has been twisted off in the stem. When this happens, there is no movement of the ball while the motor is running. This is caused by excessive torque on the motor and cannot be repaired.