

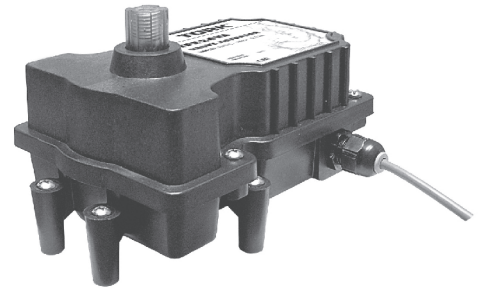
### POOL/SPA CONTROL ACCESSORIES

## MODEL TPE24VA VALVE ACTUATOR

Suitable for Pool / SPA Equipment Applications

ELECTRICAL RATINGS : 24 Volts, 60 Hz, 0.75 Amps.

Normal Operation Duty Cycle: 1 minute ON (Max), 8 minutes OFF (Min). These values may be temporarily exceeded during installation testing and adjustment.



### **! WARNING** Risk of Electrical Shock

- TO BE CONNECTED TO A CLASS 2 CIRCUIT ONLY
- ALL WIRING MUST COMPLY WITH ALL STATE AND LOCAL ELECTRICAL CODES INCLUDING THE NATIONAL ELECTRICAL CODE AND/OR CANADIAN ELECTRICAL CODE.

**READ, FOLLOW & SAVE THIS INSTRUCTION MANUAL**

### MOUNTING ACTUATOR ON TOP OF VALVE

1. Unscrew the hold-down knob and remove handle from valve shaft. Set aside the knob and handle for later use.
2. With a Phillips screwdriver, remove the four screws from the valve body as shown in Figure 1.
3. Turn the actuator over and observe the teeth as shown in Figure 2.
4. Place the actuator over the valve shaft so the small tooth engages with the small slot in the valve shaft. See Figure 2.
5. Rotate the actuator until the actuator posts line up with the four holes so it matches one of the mounting positions shown in Figure 3. See table below for descriptions of mounting options.

#### Mounting Options

**Standard Plumbing** - A three-port valve is the port B (middle) being the incoming (common) port and A and C ports are the outlet ports (see Figure 1).

**Standard Actuator Mounting** - The main body of the actuator is over port B as shown in Item II of Figure 3.

The actuator can also be mounted on top of a valve in four different positions as shown in Figure 3. Depending on the plumbing of the valve and mounting position of the actuator, the cams inside the actuator may have to be reset. (See next section.)

6. Use the supplied four long stainless steel screws to attach the actuator to the valve.
7. Use the hold-down knob set aside in step 1 to connect the handle to the valve shaft.
8. Connect power supply cord to a CLASS 2 CIRCUIT ONLY, rated 24V nominal, 4A or 100VA maximum.

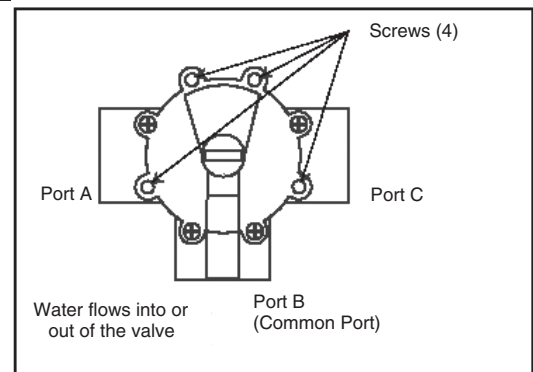


Figure 1. Standard Plumbing

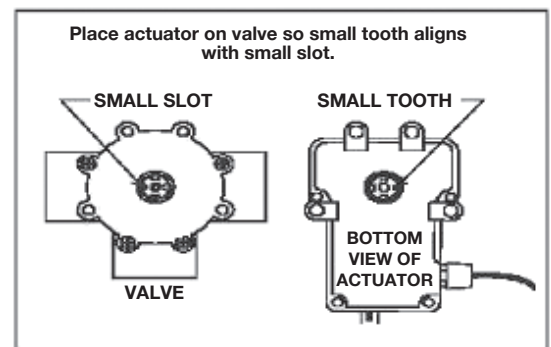


Figure 2. Actuator Mounting

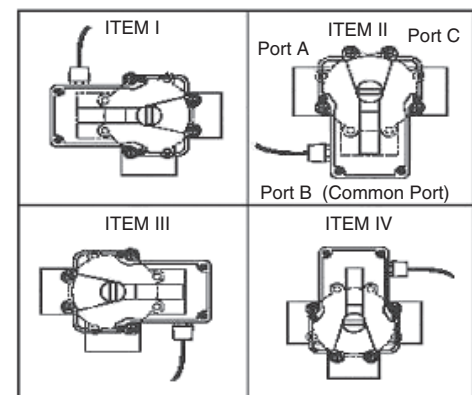


Figure 3. Mounting Positions

## RESETTING THE CAMS

1. Determine the COMMON and EXIT port(s) of the valve.
2. Remove the four screws and actuator lid to locate the cam/motor compartment. See Figure 4 to observe the cam.
3. Push down and rotate the actuator shaft (see Figure 4) so the 0 degree mark lines up with the arrow on the switch housing - ing and the bottom cam lines up with the arrow as shown in Figure 5.
4. Refer to the Cam Adjustment Table below to find the proper cam settings and then loosen the locking nut 1/4 turn coun - terclockwise and line up the specified marking on the cams with the arrows on the switch housings to reset the cams. See Figure 5.
5. Tighten the locking nut and then check the cam settings and the tightness of the shaft assembly.
6. Apply power to the valve actuator(s) and then check the valve rotation and stop positions.
7. Make adjustments if necessary. Refer to the Synchronization section and Troubleshooting section if problems persist.
8. Replace lid and verify screws and assembly are watertight.
9. Install the handle and test operation.

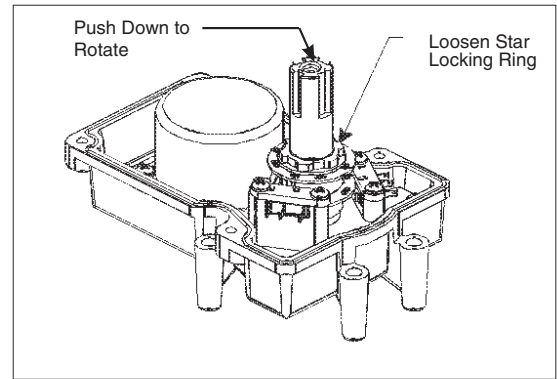


Figure 4. Cam Adjustment

### Synchronization

The Actuator is out of sync if it is rotating in the wrong direction in respect to its controller or another Actuator. In order to synchronize the system, connect Actuator(s) to the controller and observe the function. If an Actuator is out of sync, flip the 3-position switch at rear of Actuator to extreme opposite position. An example of how actuators can be out of synchronization is explained below.

Figure 6 on the right represents the valves and actuators for a pool/spa combination. The valve on the left (spa on left and pool on right) is plumbed just the opposite as the one on the right (pool on left and spa on right). If the actuators are now activated, one will turn to spa while the other is turning to pool. Changing the cam settings within the actuator will not correct this problem. To synchronize the actuators, flip the toggle switch at the rear of the actuator (which is out of sync) to the extreme opposite position. (See figure 7. Note: center position is OFF).

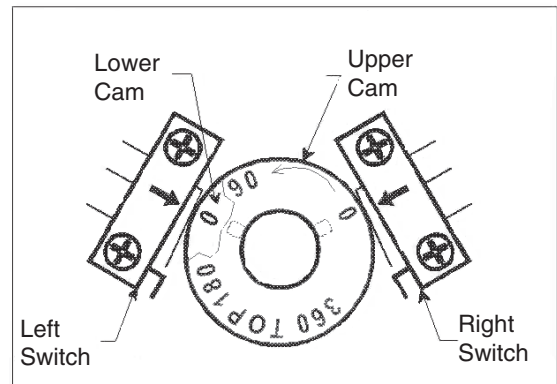


Figure 5. Cams

### Cam Adjustment Table

Actuator Position	Port, Water Enters Valve Port	Cam Setting Top Cam	Cam Setting Bottom Cam	Port, Water Exits Valve Port
I*	A	90	180	B or C
I	B	90	270	A or C
I	C	180	90	A or B
II*	A	180	90	B or C
II**	B	0	0	A or C
II	C	90	180	A or B
III*	A	90	180	B or C
III	B	270	90	A or C
III	C	0	270	A or B
IV*	A	0	270	B or C
IV	B	180	180	A or C
IV	C	270	0	A or B

\* Two Port Valve Settings

\*\* Standard Position

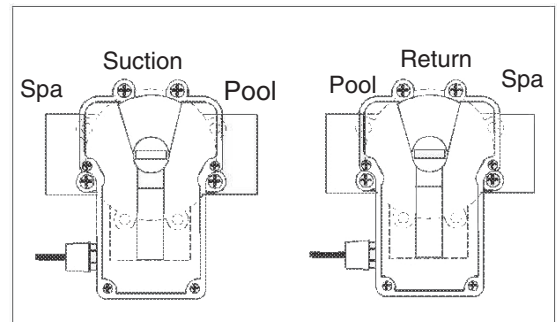


Figure 6. Synchronization, Example

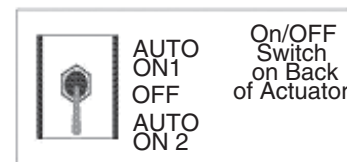


Figure 7. Synchronization, Toggle

## OPERATION

During the normal operating season, the valves may need to be rotated manually, such as draining or filling the pool/spa. The valves can be rotated electrically or manually. If the system has power, rotate electrically. If no power, rotate manually.

### Rotating Valve Actuator Electrically

1. At the rear of the Actuator, toggle the valve switch until the desired rotation is reached. See Figure 7 on previous page.
2. Toggle the switch to the center (OFF) position to stop rotation.
3. Toggle the switch back to its original position.

### Rotating Valve Actuator Manually

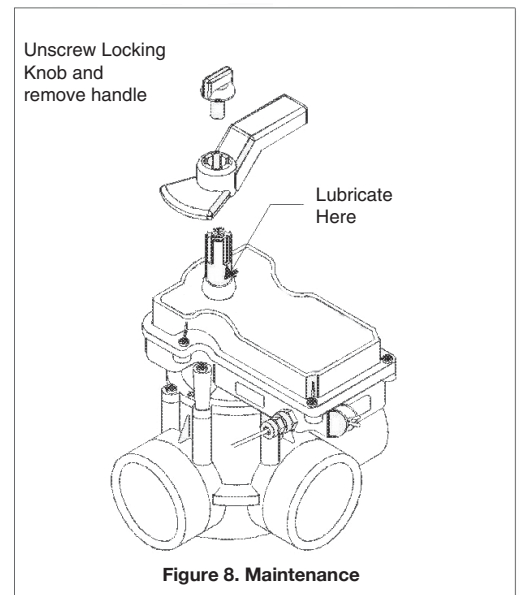
1. At the rear of the valve actuator, toggle the switch to the center (OFF) position.
2. Loosen the hand-locking knob four full turns.
3. Press down firmly on the locking knob to disengage the actuator gear train from the valve shaft.
4. Turn the handle to rotate the actuator valve to an Auto ON position.
5. Pull up on the handle and turn it gently back and forth to return to the operating (drive) condition.
6. Tighten the locking knob on the top of the handle and toggle the switch to its original Auto ON position .

## MAINTENANCE

### Servicing the Valve Actuator

The valve actuator seals need to be greased once a year. The lip seal is located under the actuator, where the shaft exits the lower housing, with two ring seals in the lid, where the shaft exits at the top. Use only silicon base lubricant, suitable for the purpose.

1. At the rear of the valve actuator, toggle the switch to the center (OFF) position. See Figure 7.
2. Loosen the hand-locking knob four full turns.
3. Press down on the locking knob to force the actuator shaft into the manual state.
4. Apply a small amount of silicon lubricant with a small brush around the exposed portion of the shaft between the bottom of the actuator and the top of the valve.
5. Turn the handle around twice to spread lubricant evenly.
6. Pull handle to ensure gears are engaged and actuator is in Auto state.
7. Remove locking nut and handle and apply a small amount of lubricant around the shaft, where it exits the lid.
8. Reinstall handle and toggle switch to desired AUTO position.



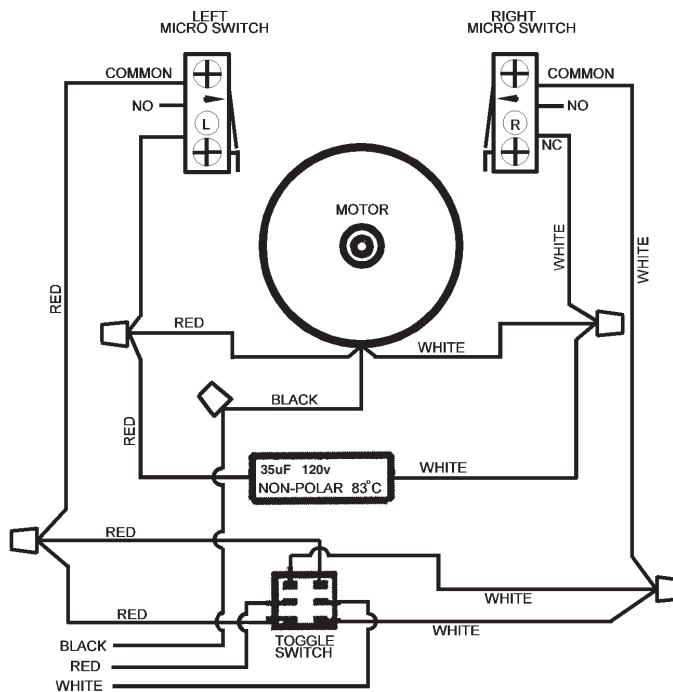
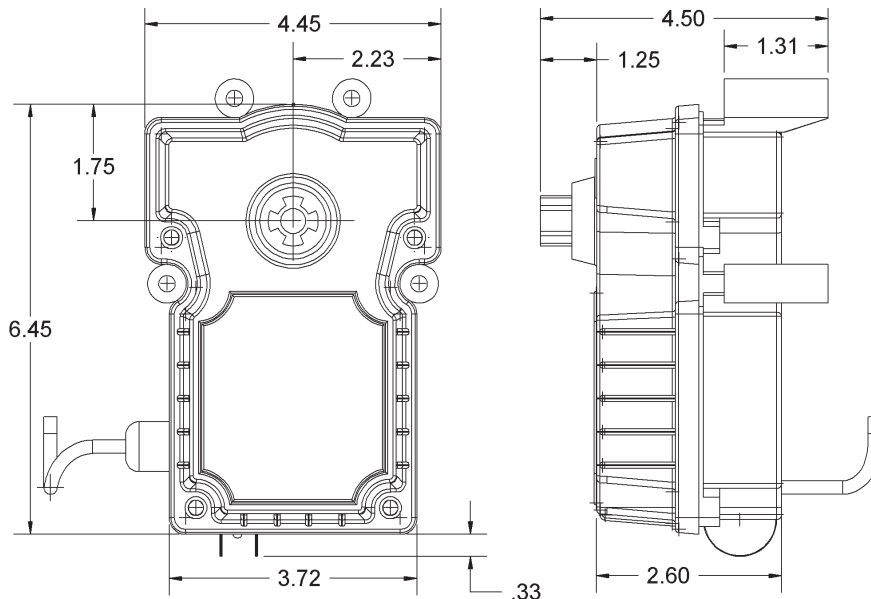
## TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Actuator handle oscillates	Lack of valve seal lubrication Obstruction in valve body	Lubricate valve Remove actuator and valve lid and inspect.
Actuator motor works, but the valve diverter does not turn	Broken actuator shaft Broken valve diverter Actuator is in manual position Actuator gear train is damaged	Replace actuator Replace valve diverter Pull up on handle while rotate counterclockwise Replace actuator
Actuator motor does not turn	No power to the actuator Toggle switch is in OFF position Motor has failed Failed or broken switch Both cams in contact with switches	Check black (common), red, and white wire voltage Move toggle switch to Auto 1 or 2 position as needed Replace actuator Replace switch Check cam setting
Actuator rotates in one direction but not back again	Broken or damage switch Bad connection(s) Bad control relay switch Broken wire	Replace switch Check all connections At power source, check operation of control relay/switch Check red and white wires
Water inside actuator	Damaged seals	Replace top lid and grease seals

# TECHNICAL INFORMATION

## SPECIFICATIONS

- Voltage: 24 Volts AC
- Amperage: 0.75 Amps
- Cycles: 60 Hertz
- Operating Temperatures  
 14°F to 167°F  
 -10°C to 75°C



**ONE YEAR LIMITED WARRANTY:** If this product fails because of a manufacturing defect within one year after purchase, we will, at our option, either repair or replace it at no charge. Our warranty does not cover damage caused by accident, abuse or misuse. We assume no further liability with respect to the sale or use of this product. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY.** We make no warranty with respect to the fitness of any goods for the users particular application. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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