



# **HAYWARD INDUSTRIAL PRODUCTS INC.**

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## **MOST COMMON ELECTRIC ACTUATOR PROBLEMS**

### **Exceeding Rated Duty Cycle (Burned-out motor)**

AC powered motors have "Duty Cycle" limitations. Hayward Controls offers a standard duty cycle motor (25%) and an extended duty cycle motor (75%). The definition of duty cycle is the amount of time a motor can run relative to the amount of time it needs to be at rest.

#### **Causes of excessive duty cycle:**

- 1) Actuators on butterfly valves with no motor brakes. Solution: Install motor brake.
- 2) Standard duty motors in modulating applications. Solution: Use an extended duty motor.
- 3) Unstable control systems (constant modulation). Solution: Use DC motor (100%).
- 4) Multiple actuators wired in parallel. Solution: Use independent relays or Valvcon relay boards.
- 5) High Temperature Exposure. Solution: Shield actuator from heat.

### **Exceeding- Rated Torque (Stripped motor gearbox)**

The gear trains in Hayward Controls actuators use rugged hardened steel spur gears. Under normal conditions, a gear failure is unlikely.

#### **Causes of stripped gears in motor gearbox:**

- 1) Manual override is not used correctly ("Push Down to Override"), thereby not declutching from the motor gearbox. Solution: Ensure proper usage
- 2) Over torque due to external influence or continuous stalling (gear fatigue). Verify actuator is sized correctly to the valve. Check Valve torque as it may have risen beyond published specifications and beyond actuator rating.

### **Incorrect wiring**

Incorrect wiring can simply cause an actuator not to run, or be as extensive as causing circuit board damage. Each actuator is supplied from the factory with an I.O.M. manual containing wiring information, as well as a built-in schematic on the "motherboard". In addition, miswiring can also be caused by working with the actuator's internal connections (i.e. motor plugged into the board in the wrong spot, limit switches reversed, Potentiometer plugged into wrong spot).

### **Out of Calibration / Out of "quadrant"**

The manual override has the capability to put the actuator in any position relative to 360 degrees. If the actuator is turned such that it leaves the 90 degree quadrant it was set up for, it will lose it's capability of positioning (many times the valve will not allow more than 90 degrees of travel). In addition, if the actuator is removed from the valve, and installed 90 degrees offset, this could cause "stalling" on butterfly valves or reverse logic on continuous rotation ball valves (what was open is now close and vice versa). Hayward Controls actuators are marked on the output drive for position orientation. Position feedback potentiometer damage could occur outside the 90 degree quadrant.

### **Improper Environmental Protection (Moisture and Corrosion Damage)**

There are three possible entries for moisture:

- 1) Override shaft - The override shaft incorporates an o-ring seal.
- 2) Cover flange - All Hayward Controls actuators are provided a gasket or an O-ring and are NEMA4 rated.
- 3) Conduit entries - The conduit holes come factory plugged (plastic plug).

If the actuator is installed correctly (override shaft has O-ring, flange gasket/o-ring is in place, all cover bolts are tight, and conduit entries have been sealed), the actuator will be protected from splashing or hose directed water. For high humidity areas, we recommend installing the heater thermostat option (T).

### **Voltage Spikes (Burned-out Board, Burned-out Capacitor)**

Voltage spikes caused by lightening or power surges can damage the electronic board circuitry. Install power conditioning and surge protection if required.

### **Old Age (Component Failure)**

Components will fail due to old age and high use (over 100,000 cycles).

### **Quality**

Hayward performs multiple steps during manufacturing to ensure the product you have received is of the highest standards. Each actuator, in addition to manufacturing QC, is tested for rated torque capability and smooth electrical operation.

Hayward Controls warrants it's electric actuators to be free from defects in material, design, and workmanship under proper and normal use and service for which the products are recommended for a period commencing on the date of shipment and ending, with respect to mechanical components of a product, one (1) year after the date of shipment.