

# Valvsys NL Electric Actuator Use and Care Manual



## 1. INTRODUCTION

The NL electric actuator by Valvsys, LLC brings the latest technology in valve actuation. The NL series delivers between 440 and 17,600in-lbs of torque in a completely enclosed compact package. The unit is designed for NEMA 4, and IP65 corrosion protection.

## 2. INSTALLATION

Installing the NL series actuator is simple and straightforward. The principle of operation requires a signal (voltage source) to be supplied, which tells the unit to drive to the open position or to drive to the close position. Note that separate signals must be sent to tell the unit which direction to rotate. The AC unit is equipped with a Permanent Split Capacitor gearmotor. This means that there are two windings (one for each direction of travel). The Capacitor helps the motor start rotating and is specially sized for actuator requirements. The capacitor is wired across both windings of the motor and is energized in both directions

1. Before applying power to the unit and before mounting it onto a valve, make sure the unit is able to rotate freely. Use the handwheel or supplied hex wrench to rotate the actuator back and forth to verify free movement. It may also be used to position the actuator to align with the valve.
2. Take care to align the actuator to operate within any travel stop screw settings.
3. Also make sure manually that the valve rotates freely. Remove any physical valve stops if possible to prevent valve damage from stalling the motor.
4. Mount the actuator onto the valve such that it is in the same operating sequence as the valve (i.e. valve open –

**CAUTION:**  
**Some valves and dampers have manual stops; remove if appropriate or adjust actuator travel switches to operate within those stops.**

- actuator open or valve closed – actuator closed).
5. Carefully align the output shaft of the actuator with the valve or damper stem. **Mis-alignment will cause premature failure.** Tighten the bolts to the actuator evenly.
6. Position the valve/actuator assembly in the mid-stroke position manually before applying power to prevent damage.
7. Connect to a power supply as per the wiring instructions. The wiring instructions are attached to the inside of the cover. Almost all applications require some type of customer-supplied switch used to direct the rotation of the unit.
8. Power to the unit should be fused with a fast acting fuse sized approximately 1.2 more amps than on the nameplate rating. All wiring is to be completed in accordance to National and Local electric codes.
9. Once wired, the unit should be rotated electrically to verify directional operation.

## 3. OPERATION

### Limit Switches

The limit switches are factory set for 90° rotation. The switches are the SPDT type which means that they have an extra contact connected when at the end of travel that can be used to electrically indicate position. The NO normally open contact is wired to the terminal strip.

All of the switches are rated at least 5amp at 115Vac for the NL1-NL4 and 15amp at 115Vac for the larger units. Two extra switch contacts may be ordered as an option (dry contacts). These switches can be used for indication or to control other devices.

### Manual Override

**CAUTION:**  
**Disconnect mains power before manual operation. Serious injury/damage can occur without removing power first.**

Remove power to the actuator prior to manual operation. Serious injury could occur because the motor will start to drive if connected to the main power source. On some units a 6mm hex wrench is supplied with the actuator to allow for manual operation of the valve. Simply remove the cover on the side of the unit and insert one end of the wrench. CW rotation of the wrench causes the actuator to rotate CW. The unit is geared so it will take several rotations to produce 90 degree actuator rotation. Note that an optional "spring to engage" handwheel 'Z1' can be ordered.

### Position Indicator

A position indicator is provided to visually determine actuator position. Avoid direct sunlight on the indicator. The indicator is held in place by tightening a friction screw. It can be easily rotated to align with the valve.

### AC Motors

The motor is a permanent split capacitor type (PSC). It has an automatically re-setting thermal protector. This means that if the unit is excessively stroked in an elevated temperature environment, the unit will shut down. The thermal switch buried in the windings of the motor opens up the current flow through the windings preventing it from burning. After the unit is left to cool the thermal switch will automatically close allowing operation again. The length of time the unit can run continuously without thermal trip is known as its duty cycle and depends on the ambient temperature. All Valvsys PSC motors are sized specifically for valve automation for long motor life. The motors are rated for 50 or 60Hz. However, the speed ratings are based on 60Hz operation. 50Hz supply increases the cycle time by approximately 1.2 times and reduces the duty cycle roughly 25%.

# NL SERIES USE AND CARE



## Housing

The cover and base have a thick protective polyester paint to guard them from corrosion. The base gasket, which seals the cover, is secured in place to prevent its loss.

## 4. MAINTENANCE

There are no special requirements for maintaining your NL electric actuator. The gear train has been permanently lubricated for a long life. If it should become necessary to re-fill the lubrication it is recommended that the unit be filled with Multi-purpose grease. If possible use Mobiltemp® SHC32 or equivalent.

The unit should be cycled periodically to verify its operation. If the unit will be stored for more than a year please refer to bulletin B00006 Long Term Storage and Care of Electric Actuators.

## 5. TROUBLE SHOOTING

- 1 PROBLEM: There is power to the unit but it does not respond.
  - 1.1 Verify that the correct voltage has been applied according to the ratings listed on the nameplate.
  - 2 Check the wiring to verify it against the wiring schematic.
  - 2.1 Check the limit switches to see if they are tripped and operating in the correct range.
  - 2.2 Check the travel limit screws and adjust accordingly.
  - 3 PROBLEM: Power is getting to the motor but it merely hums.
    - 3.1 Check to make sure that the proper voltage is applied and that all of the wiring connections are tight.
    - 3.2 Check to see that the unit is properly grounded.
    - 3.3 Check to see that the CW and CCW switches are not being powered at the same time. This will happen if the customer directional control switch is not wired correctly.
- 4 PROBLEM: The actuator performs erratically.
  - 4.1 Check to see that the actuator is not stalling. Remove the actuator from the valve and verify the freeness of the valve operation.
  - 4.2 Check to see that the valve torque requirements are less than the rated torque output of the actuator.
  - 4.3 Check the ambient temperature rating. The PSC motors are

**Caution:**  
Keep cover closed while circuits are energized.

equipped with thermal protectors which cut power to the motor if excessively cycled. High temperature ambient and cycle frequencies may heat up the motor causing the thermal protector to automatically turn off power to the motor. Simply allow the unit to cool and it will automatically re-set.

## 6. TECHNICAL ASSISTANCE

Valvsys LLC will be more than happy to provide technical assistance should it become necessary.

Please have the following available when calling for assistance:

1. Actuator model number
2. Actuator serial number
3. Input signal being used
4. Valve application

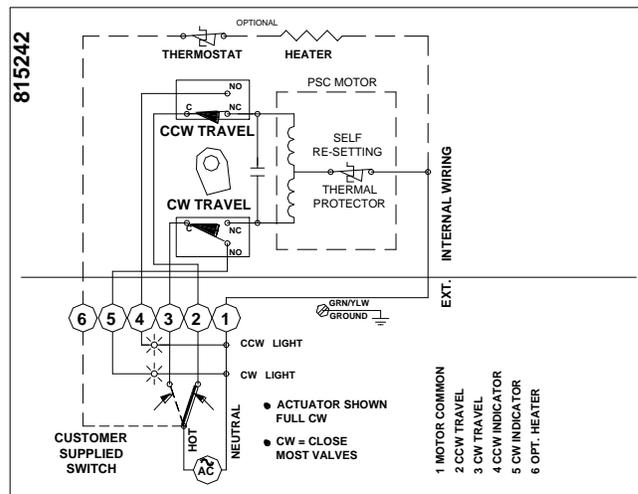
Other Bulletins that may provide assistance:

800144 NL Spec. Dwg.

B00005 Extra Switch and Heater Installation.

## Typical 115/230Vac wiring schematic

Check inside the cover, your wiring may differ



## Typical 12/24Vdc wiring schematic

Check inside the cover, your wiring may differ

