

1. INTRODUCTION

The NT electric actuator by Valvsys, LLC brings the latest technology in valve actuation. The NT series delivers 350inlbs to 8,800inlbs of torque in a completely enclosed compact package. The unit is designed for IP67 corrosion protection.

2. INSTALLATION

Installing the NT 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.

1. Before applying power to the unit and before mounting it onto a valve, make sure

Caution: Position actuator to mid-stroke before applying power. Reversal may produce unexpected rotation.

the unit is able to rotate freely. Use the manual override handwheel to rotate it back and forth. (See 'Manual Override' operation below)

2. Also make sure manually that the valve rotates freely. Remove any physical valve stops if possible to prevent valve damage from stalling the motor.
3. Mount the actuator onto the valve such that it is in the same operating sequence as the valve (i.e. valve open – actuator open or valve closed – actuator closed).
4. Carefully align the output shaft of the actuator with the valve or damper stem. Mis-alignment will cause pre-mature failure. Tighten the bolts to the actuator evenly.
5. Position the valve/actuator assembly in the mid-stroke position manually before applying power to prevent damage.
6. The unit must be properly grounded. Connect a grounding lug to the external ground nut which is located outside the housing to a suitable earth ground. The chassis ground screw is marked as shown at right. There is also an internal ground terminal for grounding purposes.
7. Refer to the wiring schematic located inside the cover for the proper power and control connections.
8. Connect to a power supply as per the wiring instructions. The wiring instructions are attached to the cover. Almost all applications require some type of customer-



Caution:
Keep cover closed while circuits are energized.

9. supplied switch used to direct the rotation of the unit.
9. Power to the unit should be fused with an appropriately sized quick acting fuse. See nameplate for the current draw requirements. All wiring is to be completed in accordance to National and Local electric codes.
10. Rotate the actuator to the middle position manually. Once wired, the unit should be rotated electrically to verify directional operation.
11. Check to see that the actuator travels to the full open and full close positions. If adjustment is needed use a hex wrench to adjust the top switch for the close position and the bottom switch for the open position.

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.

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

The manual override has a "motor preference". The lever must be moved in order to engage the handwheel. Once electric is applied the motor drive shifting is automatic. The gear box of the NT series uses a worm gear design that won't let the valve push the actuator back. Turn the handwheel CW for CW rotation of the actuator (as viewed from above looking down onto the position indicator sight glass).

AC Motors

It has an automatically re-setting thermal protector. This means that if the unit is

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

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 1-Ph motors are sized specifically for valve automation. The motors are rated for 50Hz. However, 60Hz may be used. The speed ratings are based on 60Hz operation. 60Hz supply decreases the cycle time by approximately 1.2 times and reduces the duty cycle.

Spline Adaptor

The output shaft is fitted with a removable spline adaptor for easy removal and machining to the required valve stem. Note that several different versions can be supplied ready machined such as bore and key or double D drive.

Conduit Entries

The conduit entries have a sealing ring and nut to prevent ingress contamination from the elements. See fig. 3 for the placement of the seal. Remove the cover shield and run the wires through the entrance taking care not to allow any wires to rub rotating parts i.e. cam mechanism.

Torque Switches

The NT1.3K and above units come with torque control switches for both directions of travel. See fig 2 for adjustment of the torque switches. The cams are marked to show which direction is controlled. The factory setting is for maximum torque.

Gears

The NT actuators are equipped with a spur gear, one step worm gear.

4. MAINTENANCE

There are no special requirements for maintaining your NT 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. SPECIFICATIONS AND ALLOWABLE OPERATING CONDITIONS

1. The NT series is for indoor/outdoor with an IP67 rated protection.
2. Working temperature - -20°C to 50°C.
3. Altitude not above 1000m.
4. Ambient relative moisture is not over 90% at 25°C.
5. Not to be used in strong corrosive environments.
6. Not to be used in explosive environments.
7. No heavy vibration allowed.
8. The duty cycle is intermittent.

*Refer to the nameplate attached to the outside of enclosure for specific voltage and amperage requirements.

6. TROUBLE SHOOTING

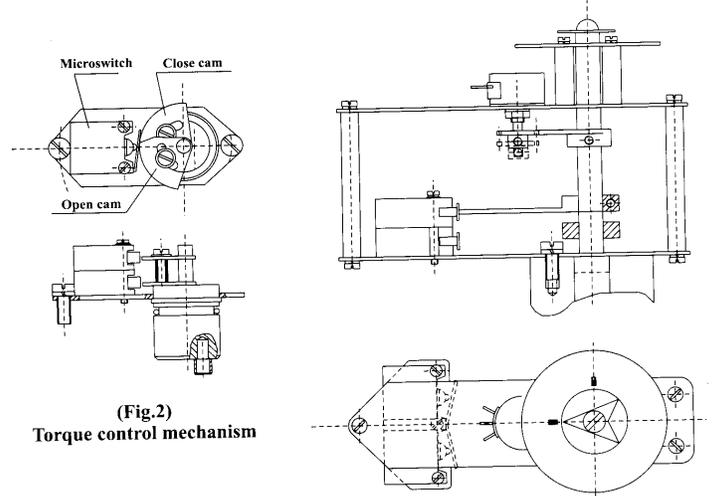
- 1 PROBLEM: There is power to the unit but it does not respond.
 - 1.1 Verify that the correct voltage has been applied according to the ratings listed on the nameplate.
 - 2 Check the wiring to verify it against the wiring schematic.
 - 2.1 Check the limit switches to see if they are tripped and operating in the correct range.
 - 2.2 Check the operation of the torque switches to see if they have been tripped.
- 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 motors are equipped with thermal protectors which cut power to the motor if excessively cycled. High temperature ambients 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.

7. 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



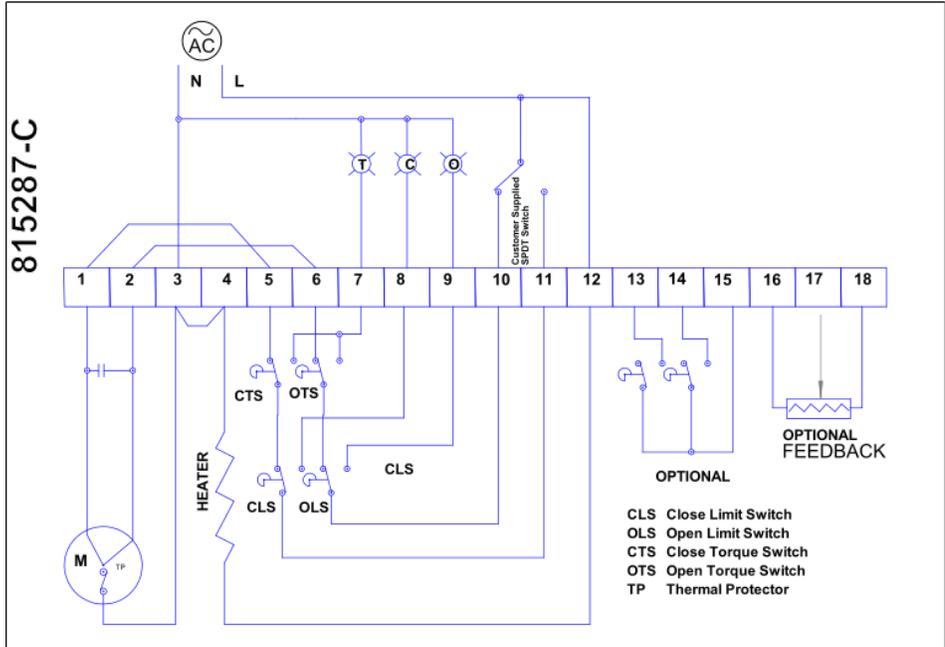
(Fig.2)
Torque control mechanism

(Fig.1)
Stroke control and indicating mechanism

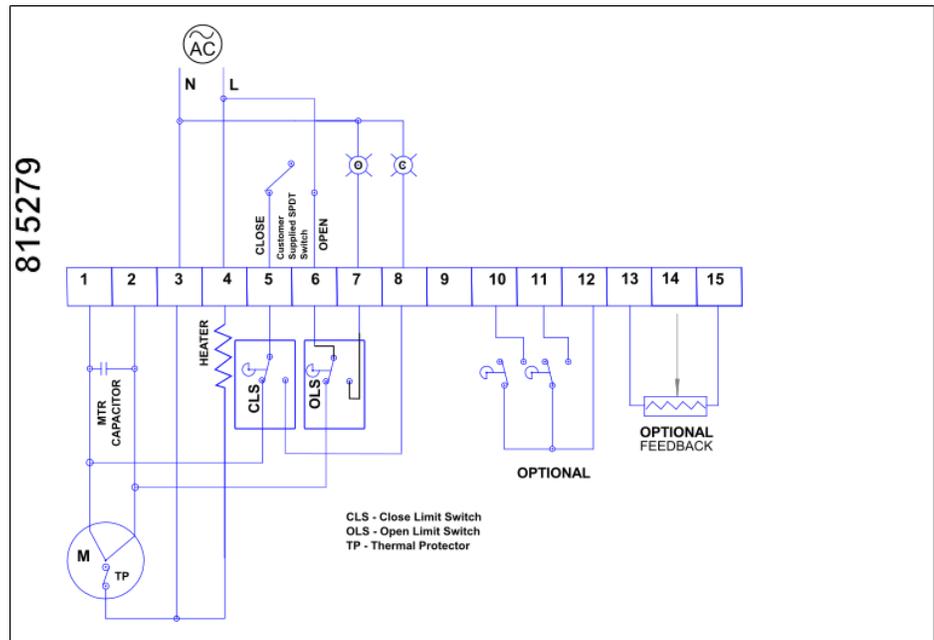
Wiring:

The wiring diagram shown below is typical. The SPDT Automatic Control switch and some of the other items (i.e. indicating lights) are not provided and must be wired by the customer.

Typical 115/230VAC Wiring Schematic for units **with** torque switches NT1.3 – NT8.8



Typical 115/230VAC Wiring Schematic for units **without** torque switches NT3 – NT7



Check inside the cover for the schematic as your wiring may differ