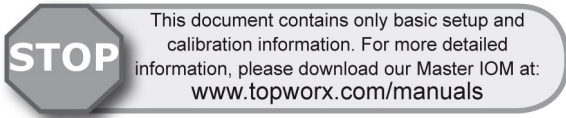


## D-Series Quick Start Guide



### Certifications and Specifications

### Wiring Diagram

### Storage

Until conduit, conduit plugs, and any applicable spool valve port connections are properly installed, the unit will not support its IP/NEMA rating as the unit ships with temporary covers. Ensure that it is stored in a dry environment with a relative humidity range between 10%-95% and a temperature ranging from -40°F (-40°C) to 160°F (71°C). Once properly installed, the temperature range listed on the nameplate will supersede this storage temperature range.

### Installation Notes



TopWorx™ products can be used on both linear and rotary valve automation applications. Always use sound mechanical practices when mounting. When fastening the TopWorx™ switch box to the bracket on the actuator, torque the fasteners to 8 ft-lbs (10.8 N·m) after cycling the valve a couple of times. This allows the shaft to self-center in the pinion slot, or coupler. Be cautious not to allow undue axial (thrust) load on the shaft.



This product comes shipped with vinyl covers in an effort to protect the internal components from debris during shipment and handling. It is the responsibility of the receiving and/or installing personnel to provide appropriate permanent sealing devices to prevent the intrusion of debris, or moisture, when stored outdoors or when installed.

It is the responsibility of the installer, or end user, to install this product in accordance with the National Electrical Code (NFPA 70 or any other national or regional code defining proper practices.

### Factory Preset

All TopWorx™ products are factory set for 90° rotation, normal acting (CW to close) with the standard conduit entries parallel to the process piping. Switch 1 (lower switch) is set to trip at full clockwise (closed) position of the process valve. When changing orientation the target disk will have to be relocated for your application. All Push-Set Target disks are supplied with 4 slots on 90° increments allowing the TopWorx™ unit to be rotated 90°, 180°, or 270° from standard.

On reverse acting units the switch function will be transposed. On units with indicator domes, the dome cover with mask will have to be rotated to give proper indication.

For ESD units please download our Master IOM at: [www.topworx.com/manuals](http://www.topworx.com/manuals)

### Switch Calibration Procedure for Non-Bus Models

Applies to TopWorx D-Series with B, E, F, J, K, L, M, N, V, P, T, R, Z, 3, 7, 8, PS and PN bus/sensor options (Refer to the fourth digit of the product part number to identify).



Never perform the switch calibration procedure while in an area that could be hazardous. Intrinsically Safe models, unit must be wired in accordance the control drawing included with the product.

For TopWorx D-Series with L, M, R, P, T, K and PN bus/sensor options: Calibration may be performed using a Volt-Ohm meter by using the Ohm setting across COM and NO. When switch is active, the meter will read <0.5 Ohms, or the Diode setting may be used simply to indicate continuity. If a direct power source is being used, an appropriately sized resistor must be used in series with the contacts, or permanent damage will occur. Refer to the certifications and specifications section for current limitations. For all other models a power source and resistors will be required.

Depending on the model selected you will have one of two target designs. The first uses a disk mounted to the shaft with moveable targets located in radial slots and is labeled as "Push-Set Target" on the disk. The second utilizes spring loaded cams which mate to splined shaft collars allowing 360° adjustability. Some models, such as the DXP-ES, use a combination of both designs.

### For Push-Set Target builds with 1-4 switches:

- Step 1: With valve in the CLOSED position. Push down and slide the target(s) until the switch(es) activates. Release the target(s) to lock the position.
- Step 2: Rotate valve to the OPEN position. Push down and slide target(s) until the switch(es) activates. Release the target(s) magnet to lock the position.
- Step 3: Cycle valve CLOSED and OPEN several times to ensure continued calibration.

### For splined shaft collar builds with 1-6 switches:

- Step 1: With valve in the CLOSED position, disengage the cam(s) from the splined hub(s) and rotate until the switch(es) activates. Release cam(s) to re-engage splined hub(s).
- Step 2: Rotate valve to OPEN position, disengage the cam(s) from the splined hub(s) and rotate until the switch(es) activates.
- Step 3: Cycle valve CLOSED and OPEN several times to insure continued calibration

### Calibration of 4-20mA Analog Position Transmitter (optional)

The 4-20 current transmitter can be used for any rotation range between 20° and 320° and can be set to accommodate 3% over or under travel or for full linear. Reverse directions are automatically accounted for during the calibration process.

- Step 1: Apply power to unit (LED should be continuously on)
- Step 2: Option 1: +/- 3% Over and Under Travel at the Set End Points

Counter-clockwise calibration - Press the button greater than 0.5 seconds and less than three seconds if you are going to calibrate using a counter-clockwise rotation from the 4mA position to the 20mA position. (LED will start flashing a 3 - 1 code indicating that calibration mode is active and the unit is waiting to calibrate the 4mA position).

Clockwise calibration - Press the button greater than three seconds and less than 5 seconds if you are going to calibrate using a clockwise rotation from the 4mA position to the 20mA position. (LED will start flashing a 3 - 2 code indicating that calibration mode is active and the unit is waiting to calibrate the 4mA position).

### Option 2: No Under and Over Travel at Set End Points (Full Linear)

Counter-clockwise calibration - Press the button greater than 5.5 seconds and less than eight seconds if you are going to calibrate using a counter-clockwise rotation from the 4mA position to the 20mA position. (LED will start flashing a 5 - 1 code indicating that calibration mode is active and the unit is waiting to calibrate the 4mA position).

**Clockwise calibration** - Press the button greater than 8 seconds if you are going to calibrate using a clockwise rotation from the 4mA position to the 20mA position. (LED will start flashing a 5 - 2 code indicating that calibration mode is active and the unit is waiting to calibrate the 4mA position).

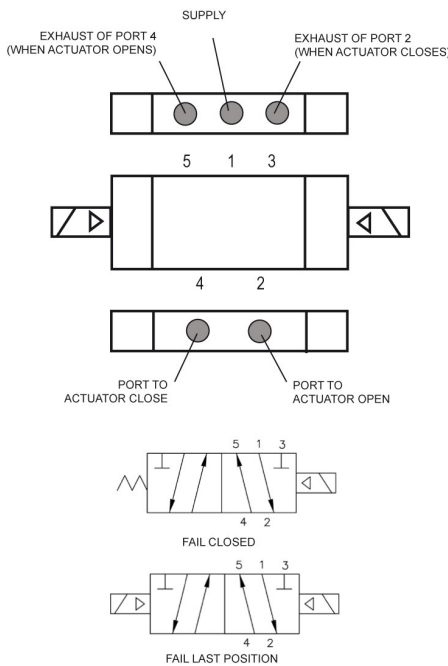
- Step 3:** Rotate valve to the desired position corresponding to 4mA. (This can be the open or closed position)
- Step 4:** Press and release the button to capture the 4mA value (The LED will start flashing a 3-3 code indicating that the unit is waiting to calibrate the 20mA position)
- Step 5:** Rotate valve to the desired position corresponding to 20mA (This will be the position opposite of the position in step 3)
- Step 6:** Press and release the button to capture the 20mA value (The LED will turn on continuously)

### Pneumatic Hookup Procedures

Prior to connecting the supply air to the spool valve, flush the system to remove any debris or contaminants. Galvanized pipe can easily flake and contaminate the system and therefore is not recommended. A 40 micron point of use filter at every device is recommended.

### 4-Way Spool Valves

The TopWorx™ spool valve is a 5 port, 4-way valve driven by an internally mounted pilot valve. The spool valve supply port and work ports are marked as follows:



**STOP** Never Plug, Block, or Restrict Port 5

| Spool Valve Specifications |                                                    |
|----------------------------|----------------------------------------------------|
| Medium                     | Dried, filtered air (40 micron)                    |
| Operating Pressure         | 45psi (3.10 Bar) - 100psi (6.89Bar)                |
| Flow Coefficient           | 1.2Cv or 3.0Cv (1.0 for ColdTemp™)                 |
| Environmental Rating       | Type 4, 4X, IP67 (metal enclosures only)           |
| Port Size                  | 1/2"NPT for 3.0Cv valve<br>1/4"NPT for 1.2Cv valve |
| Manual Override            | Available with push button momentary latching      |
| Valve Body                 | Available in Hardcoat Anodized Aluminum or 316     |
| Valve Seals                | Silicone /EPDM                                     |

### Special Conditions of Safe Use (All installations)

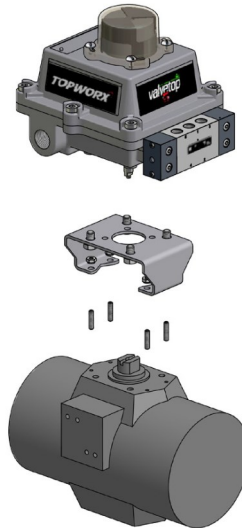
Clean only with a damp cloth to prevent possibility of electrostatic discharge. For Explosion Proof installations, the internal ground connection shall be used and the external ground connection, if supplied in addition, is supplemental bonding allowed where local authorities permit, or is required. Refer to the D-Series Master IOM for Proof Testing instructions.

### Preventative Maintenance

TopWorx™ switch boxes are designed to operate for one million cycles without servicing. Call TopWorx™ when you are approaching this milestone for a preventative maintenance kit and instructions.

### EC Declaration of Conformity

The products described herein, conform to the provisions of the following European Community Directives, including the latest amendments:  
 Low Voltage Directive (2006/95/EC)  
 EMC Directive (2004/108/EC)  
 Machinery Directive (2006/42/EC)  
 ATEX Directive (94/9/EC).



### About Emerson-TopWorx

Emerson Process Management, is the global leader in valve control and position sensing for the process industries. Our solutions enable plants, platforms, and pipelines to manage and control operations more intelligently and efficiently under the most demanding and extreme conditions.

TopWorx™ discrete valve controllers enable automated on/off valves to communicate via FOUNDATION Fieldbus, Profibus, DeviceNet, AS-Interface, and HART protocols. They attach to all rotary and linear valves and actuators and carry a variety of global certifications.

GO™ Switch proximity sensors and limit switches provide the ultimate position sensing reliability and durability in extremely hot, wet, cold, dirty, abusive, corrosive, and explosive environments.

For more information please visit [www.topworx.com](http://www.topworx.com).

### Global Locations:

|                                                                                                                      |                                                                                                                                      |                                                                               |
|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>Americas</b><br>3300 Fern Valley Road<br>Louisville, Kentucky<br>40213 USA<br>+1 502 969 8000                     | <b>Europe</b><br>Horsfield Way<br>Bredbury Industrial Estate<br>Stockport SK6 2SU<br>United Kingdom<br>+44 0 161 406 5155            | <b>Asia-Pacific</b><br>1 Pandan Crescent<br>Singapore 128461<br>+65 6891 7550 |
| <b>Middle East</b><br>P.O. Box 17033<br>Jebel Ali Free Zone<br>Dubai 17033<br>United Arab Emirates<br>+971 4811 8283 | <b>Africa</b><br>24 Angus Crescent<br>Longmeadow Business Estate East<br>Modderfontein<br>Gauteng<br>South Africa<br>+27 11 451 3700 |                                                                               |



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