TOPWORX™

# TX-Series Quick Start Guide

**STOP** This document contains only basic setup and calibration information. For more detailed information, please refer to our website at: www.topworx.com

## Certifications and Specifications

## Wiring Diagram

## Installation Notes

*TX-Series products can be used on both linear and rotary valve automation applications. Always use sound mechanical practices when mounting. When fastening the TopWorx™ Switchbox 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 conduit 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 on normal acting actuators. The switch at full clockwise is for process valve closed and uses the red striker. When changing orientation, the target disk will must be relocated for your application. The target is designed to be adjusted 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. Clockwise for open will become clockwise for closed. On units with indicator domes, the dome cover with mask must be rotated to give proper indication.*

## Switch Calibration Procedure

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

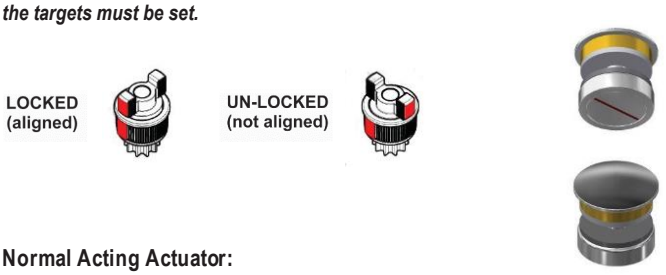
*For Options D, S, L, M, K, T, P, R, AS, & PB, calibration may be performed using a Volt-Ohm meter by using the Ohm setting across COM and NO. When switch is active, the meter will read <1.0 Ohms, or the Diode setting may be used simply to indicate continuity. If a direct power source is being used, an appropriately sized resistor must be used in series with the contacts, or permanent damage will occur.*

*For all INDUCTIVE sensor options, a power source and resistors will be required for calibration. (Refer to the product nameplate for current limitations.)*

## Setting Switches

GO™ Switch, Mechanical Switches, Reed Switches, AS-i, Profibus, & ALL threaded, cylindrical inductive sensor options (except the D & S options).

*Each TX-Series unit is equipped with 2 or 4 adjustable targets with a usable range between 45° and 90°. For normal acting applications, the targets are color coded red for closed and green for open. The color code would be reversed for reverse acting units. After installing the unit on the actuator or valve assembly, the targets must be set.*




### Normal Acting Actuator:

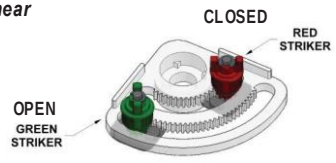
*Step 1: Rotate the valve full clockwise to the closed position.*
*Step 2: Unlock/push/twist the target as required to engage the switch and lock target, if applicable.*
*Step 3: Rotate the valve full counterclockwise to the open position.*
*Step 4: Unlock/ push/twist the target as required to engage the switch and lock target if, applicable.*

### Reverse Acting Actuator:

*Step 1: Rotate the valve full clockwise to the open position.*
*Step 2: Unlock/push/twist the target as required to engage the switch and lock target, if applicable.*
*Step 3: Rotate the valve or push and move the target a full counterclockwise to the closed position.*
*Step 4: Unlock/push/twist the target as required to engage the switch and lock target if, applicable.*

### For Switching Angle Under 45° (not applicable for D & S options):

*When the switch box is mounted to a linear actuator or when the actuator strokes less than 45°, we recommend the following:*




*Step 1: Remove shaft from Switchbox by removing the circlip underneath the Switchbox.*
*Step 2: Remove the circlip underneath the cam, if equipped, then push the cam down the shaft by 3-4mm and turn it 90°.*
*Step 3: Push the cam back up, you will see the flats fit snugly between the locating lugs inside the hub.*
*Step 4: Replace the circlip.*
*Step 5: Remove the closed switch from the bracket and install it on the inside of the bracket next to the open switch.*

### To Re-Assemble (not applicable for D & S options):

*Step 1: Replace the screws with M3 X 25mm long screws (insert through both switches and bracket and fasten with the nut on the inside closest to the switch box bearing).*
*Step 2: Remove the Closed striker assembly (red) by removing the circlip or screw on top and install it on the inner rack.*
*Step 3: Unlock target and twist the green striker to the other end of the cam's rack and lock target. (The red striker assembly should be twisted to the other end of the inner rack).*
*Step 4: Re-install the shaft in the switch box and fit the s/s washer and circlip to the underside of the switchbox.*
*Step 5: The switches can now be set anywhere between 0° & 45°.*

*Continued:*

**For Switching Angle Up to 180° (D, S – 4 option can rotate up to 180° if only two targets are utilized):**

*Step 1: Remove shaft from Switchbox by removing the circlip underneath the Switchbox.*

*Step 2: Remove the open switch from the bracket and install it on the inside of the bracket.*

*Step 3: Remove the open striker assembly (green) by removing the circlip or screw on top and install it on the inner rack next to the red striker assembly.*

*Step 4: Re-install the shaft in the Switchbox and fit the s/s washer and circlip to the underside of the Switchbox.*

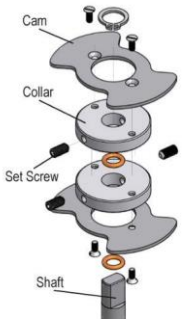
*Step 5: The open switch can now be set anywhere between 90° & 180°.*

**Setting Slotted Inductive Sensors:**

*Step 1: Loosen set screw*

*Step 2: Rotate cam(s) and collar(s) until desired switch function is achieved*

*Step 3: Tighten set screw*

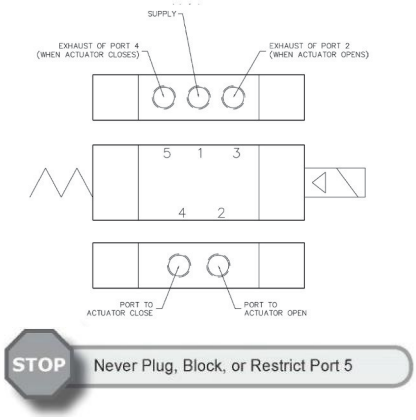



**Pneumatic Hookup Procedures:**

*Prior to connecting the supply air to the spool valve, flush the system to remove any debris or contaminates. 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:*




**Highly Recommended**

*TopWorx™ highly recommends Locktite 567 brand thread sealant. Do not use a hard setting pipe compound. If Teflon thread seal tape is used, start the wrap on the second thread from the leading thread of the fitting. This will prevent tape shreds from contaminating the spool valve seals.*

*Breathers (AL-M30 1/8" NPT) should be installed in the exhaust ports to keep debris from falling into the spool valve and damaging the seals. This must be addressed prior to installation, or storage.*

*A flow control may be used in Port 3 but should NEVER BE USED in Port 5. Any blockage or restriction may cause an internal pressure build-up inside the enclosure and pose a safety issue.*

| Spool Valve Specifications | |
|---|---|
| Medium | Dried, filtered air (40 micron) |
| Operating Pressure | 30psi (2.76Bar) - 100psi (6.89Bar) |
| Flow Coefficient | 1.0Cv |
| Environmental Rating | Type 4, 4X, IP67 (metal enclosures only) |
| Port Size | 1/4" NPT or BSP for 1.0Cv valve, exhaust ports are 1/8" NPT or BSP |
| Ambient Temp Range | Refer to product nameplate marking |
| Valve Body | Available in Hardcoat Anodized Aluminum or 316 Stainless Steel |
| 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 TX-Series Master IOM for Proof Testing instructions. Switchbox cover screws are not of standard form and they may only be replaced with identical screws sourced from the manufacturer (minimum grade A2-70 or A4-80 to ISO 35061). Switchbox cover screws should be tightened to a minimum of 10.85 Nm (8 ft-lb).*

*When installing with a third party listed nipple-mount solenoid, it is the responsibility of the installer to provide fittings, and apparatus, suitable for the area classification in accordance with the National Electrical Code. All cable entry devices or conduit stopping boxes shall be certified in type of explosion protection, suitable for the conditions of use, and correctly installed.*

*The IIC enclosures are excluded from use in Carbon disulphide atmospheres. The air pressure to the valve block, when fitted, shall not exceed 7 bar.*

**Preventative Maintenance**

*TopWorx™ Switchboxes 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 *(2014/35/EU)*
EMC Directive *(2014/30/EU)*
ATEX Directive *(2014/34/EU)*

**Typical Mounting Assembly**

**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**

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