

# Emerson TopWorx™ DVR

Valve Position Monitor



# Contents

<b>Section 1: Installation on Actuator</b>	<b>1</b>
<b>Section 2: Dimension and Materials</b>	<b>4</b>
<b>Section 3: Indicator Assembly</b>	<b>6</b>
<b>Section 4: Basic Functions</b>	<b>7</b>
<b>Section 5: Switch Option M2</b>	<b>9</b>
<b>Section 6: Maintenance</b>	<b>10</b>

## **WARNING**

To reduce risk of death, serious injury or property damage:

- Personnel installing, maintaining, or operating this equipment must be qualified, must read, understand, and follow these instructions before proceeding.
- This document must be retained for future reference.
- Please contact local TopWorx representative for questions, clarifications, or comments.

# Installation On Actuator

## General Guidance

The DVR is designed to monitor state open and shut of equipment such as valve or actuators. The unit is not suitable for use on multi-turn rotation equipment.

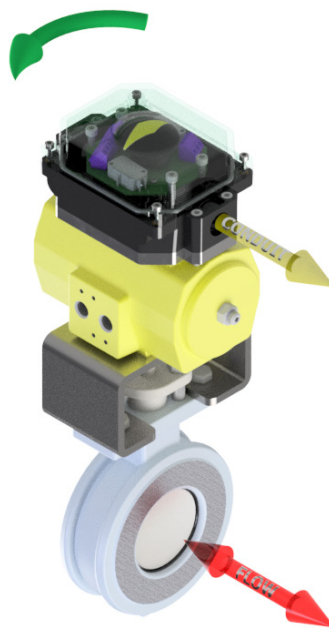
## Normal and Reverse Acting

Normal acting is full clockwise (CW) when the process valve is closed and counterclockwise (CCW) when the process valve is open. Reverse acting is full CW when the process valve is open and CCW when the process valve is closed.

Indicator is designed to accommodate **both Normal and Reverse Acting units.**

Figure 1-1 shows a TopWorx™ unit mounted parallel to the process valve in the closed position. The green arrow at the top shows the “normal acting” direction of travel to open the valve. This is the standard orientation of your unit unless otherwise specified and will be factory set to operate in this fashion.

Figure 1-1 TopWorx™ Unit Mounted Parallel

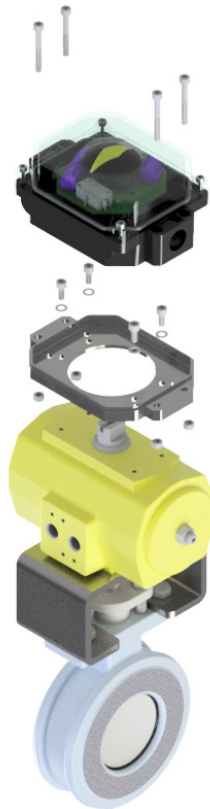


### Installation on Actuator Mounting

TopWorx™ has numerous mounting bracket kits available to meet your specific application. Consult your local distributor or factory representative for ordering information. Figure 1-2 shows a direct Namur mount on a quarter turn valve.

Refer to your mounting kit documentation for specific mounting instructions.

**Figure 1-2 Installation on Actuator Mounting**



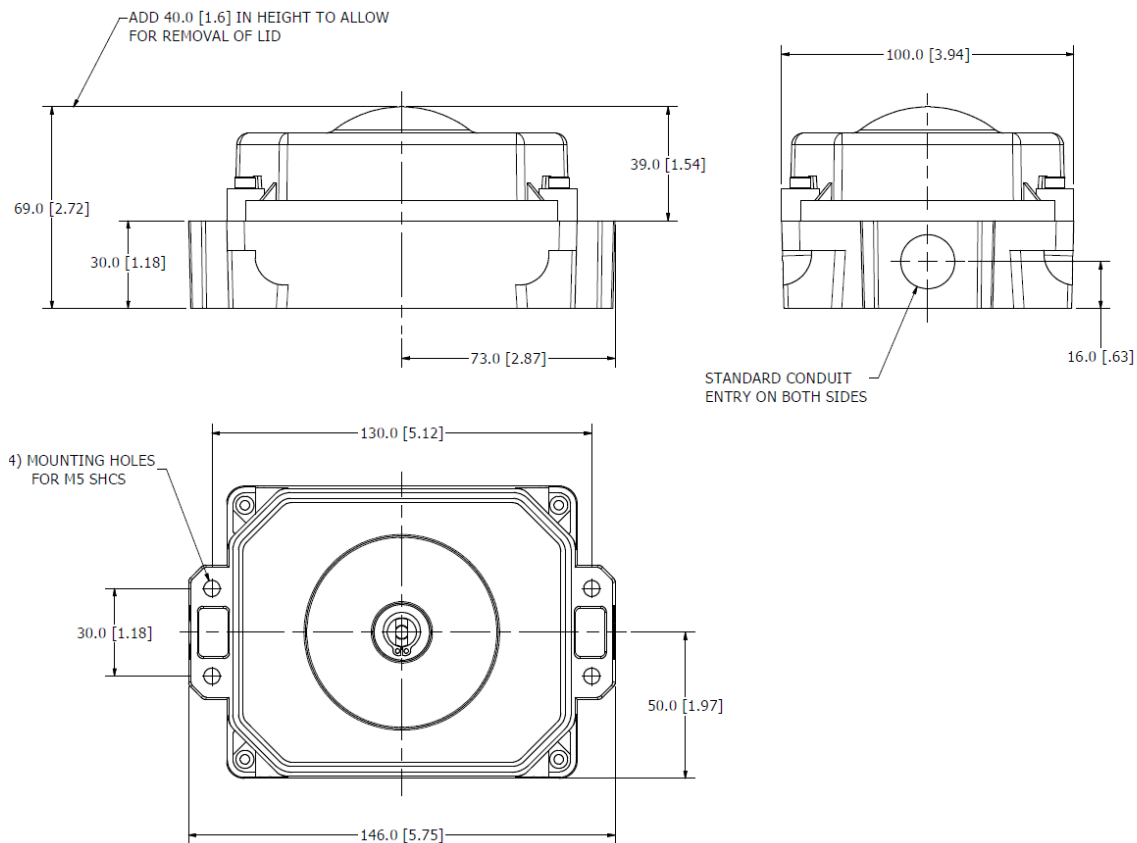
### Installation Notes

1. Remove the upper housing of the unit to allow access to the cam assembly.
2. Hold the unit above the mounting surface in the orientation in which you intend to mount. Rotate the shaft to align the tang with the actuator slot. In some cases, it may be necessary to rotate the cam on the shaft to allow assembly. The cam is secured with a compression spring. Simply grasp the cam, pull up and realign the cam as required.
3. Use caution not to allow undue axial (thrust) load on the shaft.
4. Cycle the valve a couple of times prior to final tightening of the mounting kit hardware. This allows the shaft to self-center in the pinion slot, or coupler. Refer to the dimensions and materials section of this document for appropriate tightening torque.
5. Always use sound mechanical practices when torquing down any hardware or making pneumatic connections.
6. This product comes shipped with conduit labels 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, and moisture, when stored outdoors, or when installed.
7. 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.

### Cable Entries

External electrical connections are made via two molded cable entries. The installation of the external connections and plugging of the unused entry must be carried out using appropriate IP6X cable glands and blanking plugs.

**Figure 2-1 Dimension and Materials: TopWorx™ DVR**

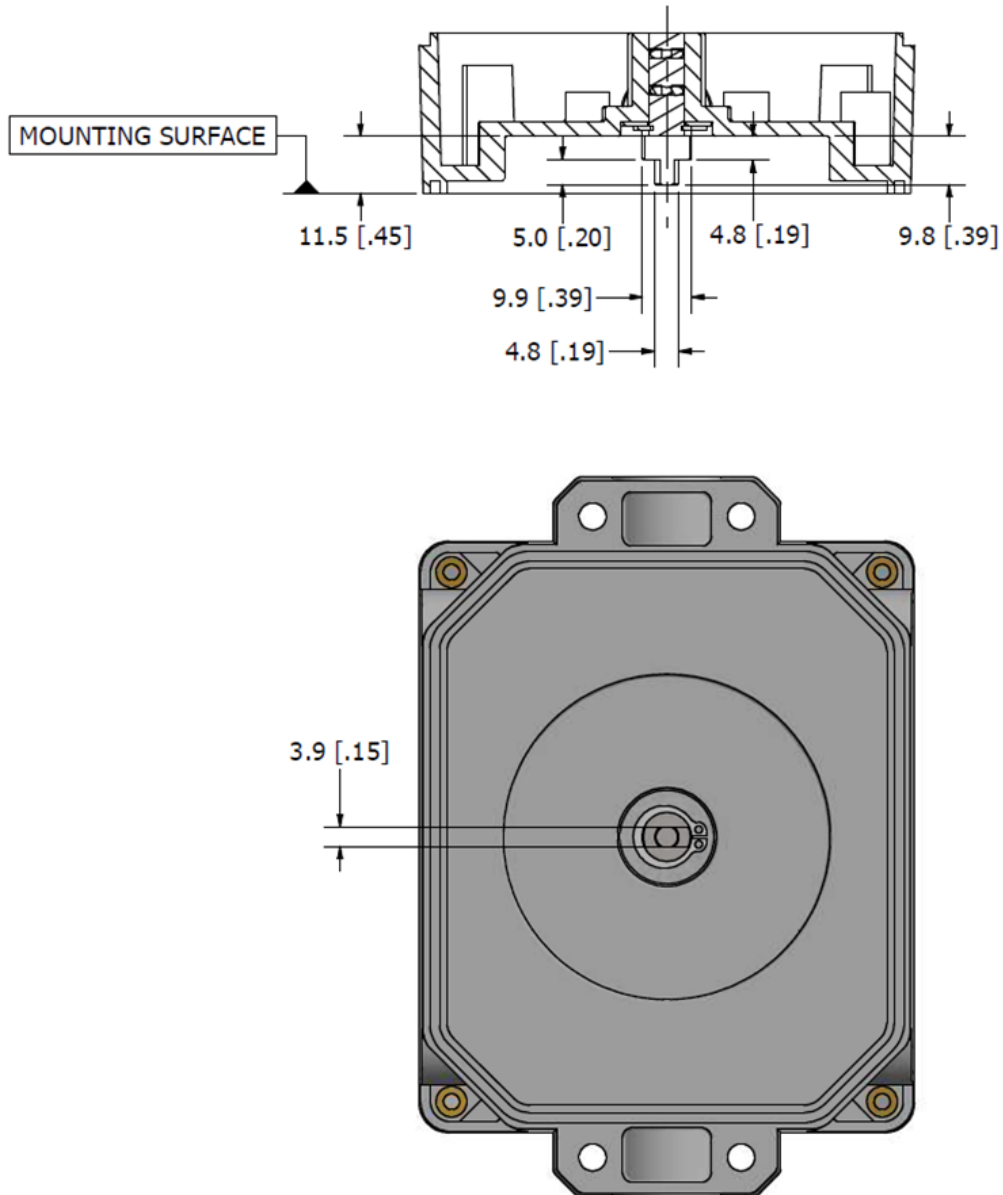


Maximum Fastener Torque Specifications	
Lid Screws	1.41 N-m [200 in-oz]
Bottom Mounting Holes	5.4 N-m [4 ft-lbs] +/- 10%

Material Of Construction	
Enclosure	Lexan 123R UV F1 Rated
Fasteners	304 Stainless Steel standard 316 Stainless Steel optional
Shaft	316 Stainless Steel standard
Indicator Dome	Lexan 123R UV F1 Rated
Seals	Silicone

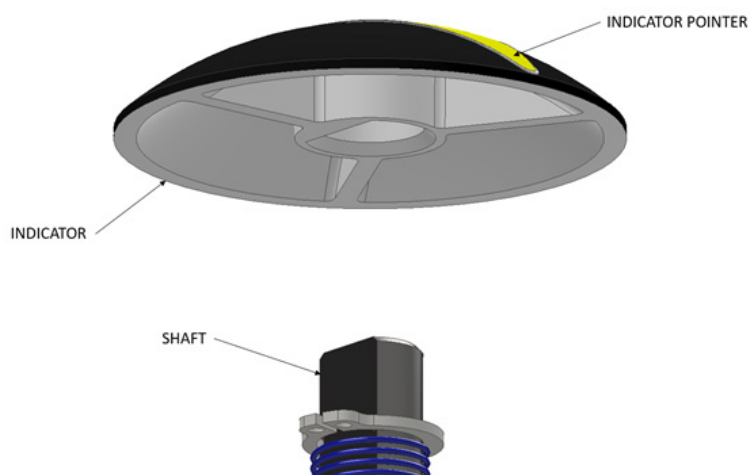
## 2.2 Shaft Details

Figure 2-2 Dimension and Materials: Shaft Details



# Indicator Assembly

Figure 3-1 Indicator Assembly





# Basic Functions

## Basic Function: Sensor

Each unit is equipped with 2 adjustable cam assemblies with a usable range between 0° and 90°. The cam must be set after the unit is installed on the actuator in normal or reverse acting applications.

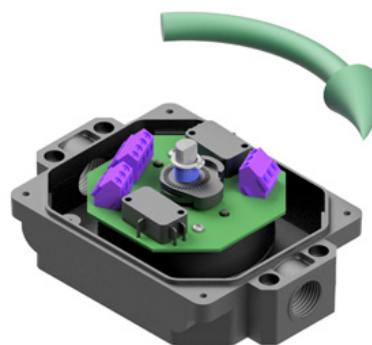
### *Normal acting*

1. Rotate the valve full CW to the close position.
2. Pull the bottom cam towards spring side and rotate the cam CW or CCW until SW1 activates. Release cam to re-engage with shaft hub.
3. Rotate the valve full CCW to the open position.
4. Pull the top cam towards spring side and rotate the cam CW or CCW until SW2 activates. Release cam to re-engage with bottom cam.
5. Ensure bottom cam is engaged with shaft hub with spring tension.

### *Reverse acting*

1. Rotate the valve full CW to the open position.
2. Pull the bottom cam towards spring side and rotate the cam CW or CCW until SW1 activates. Release cam to re-engage with shaft hub.
3. Rotate the valve full CCW to the closed position.
4. Pull the top cam towards spring side and rotate the cam CW or CCW until SW2 activates. Release cam to re-engage with bottom cam.
5. Ensure bottom cam is engaged with shaft hub with spring tension.

Figure 4-1 Sensor



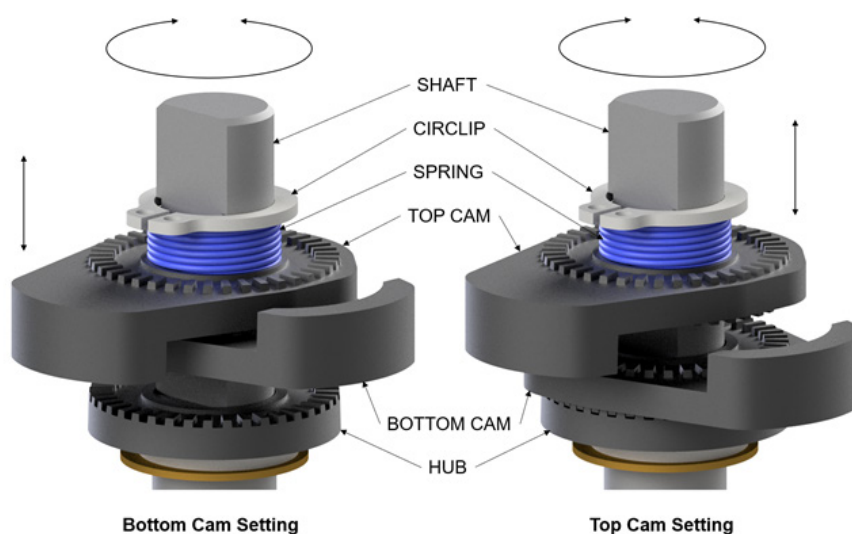
**⚠ WARNING**

Cam assemblies are spring-loaded and may eject forcefully upon disassembly. They are not required to be disassembled during normal operation or calibration. Use caution when disassembling.

**Switch Cam Setting**

The switch actuation cams are driven via splines located on cam face which engage with the drive hub. To adjust the position of the bottom cam, pull the cam off the hub, compressing the location spring. Rotate to the desired position and release. Check that the bottom cam has correctly re-engaged with the hub. The top and bottom cam are engaged with each other, to adjust the top cam repeat the same procedure as mentioned above. Check that the top cam has correctly re-engaged with bottom cam.

**Figure 4-2 Switch Cam Setting**

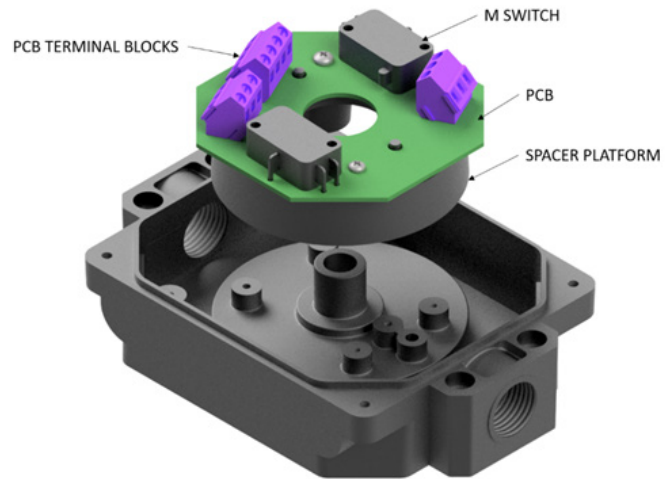
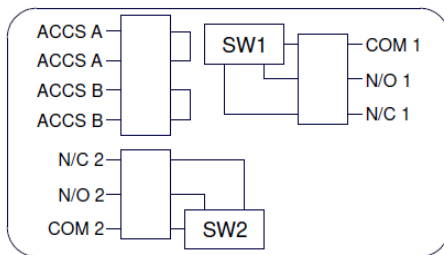


# Switch Option M2

## Switch Option M2: SPDT Mechanical Switches

When installing unit with M switches, a standard voltage/ohm meter may be used to set the cams by looking for continuity between the N/O and COMMON wires.

Figure 5-1 Wiring Diagram



Product Specifications Option M	
Switch Type	Mechanical
Sealed	No
Form	SPDT
Electrical Rating	10A@125VAC or 250VAC
Conforming to Standards	UL 1054
Terminal Maximum wire size	2.5 mm <sup>2</sup> / 10 AWG
Insulation Resistance	≥500MΩ (at 500V DC)

# Maintenance

## Assembly and Dismantling

Other than removing and replacing of the cover for the purpose of installation and calibration this unit should not be dismantled and reassembled. Torque the cover fasteners to 1.41 N-m (200 in-oz) after installation and calibration is completed.

If there is a need to repair the product, it should be returned to TopWorx™. Repair work carried out by unauthorized personnel may invalidate the approval of the product and render it unsafe to use.

## Area Classification

No Approvals: These units are designed to be operated in areas free from flammable gas, vapor, or dust-air mixtures.

© 2013-2022 TopWorx, All rights reserved. TopWorx™, and GO™ Switch are all trademarks of TopWorx™. The Emerson logo is a trademark and a service mark of Emerson Electric. Co. © 2013-2022 Emerson Electric Company. All other marks are the property of their respective owners. Information herein – including product specifications – is subject to change without notice.

Global Support Offices

**North America**

3300 Fern Valley Road  
Louisville, Kentucky 40213 USA  
1 502 969 8000  
info.topworx@emerson.com

**Asia-Pacific**

1 Pandan Crescent  
Singapore 128461  
65 6777 8211  
info.topworx@emerson.com

**Europe, Middle East, Africa**

2 Pit Hey Place, West Pimbo  
Skelmersdale, WN8 9PG  
United Kingdom  
+44 01695 713614  
info.topworx@emerson.com

**TOPWORX™**

