# valvetop

# DISCRETE VALVE CONTROLLERS
## POSITION MONITORING AND CONTROL OF AUTOMATED ON/OFF VALVES

- Suitable for use on rotary and linear applications

- Certified for use in all hazardous areas

- Integrated solutions (bus + sensors + pilot)

- Technology leadership in fieldbus networks

TOPWORX

EMERSON™
Process Management

# TOPWORX

## GLOBAL LEADER IN VALVE CONTROL AND POSITION SENSING



TopWorx™, a division of Emerson™ Process Management, is a 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.

### GLOBAL TECHNOLOGY LEADERSHIP

TopWorx technology advancements are at the forefront of innovation in the process automation industry. TopWorx uses wireless technologies and fieldbus protocols such as FOUNDATION Fieldbus, DeviceNet, AS-Interface, Profibus, and HART to reduce installation costs and enable predictive maintenance.

### GLOBAL HAZARDOUS AREA CERTIFICATIONS

In addition to high temperature (204°C), cold temperature (-50°C), and sub-sea (6,800 meters) applications, TopWorx products are suitable for use in Flame-proof/Explosion Proof, Non-Incendive, Intrinsically Safe hazardous areas with IECEx, ATEX, GOST, InMetro, UL, CSA, KOSHA, and NEPSI certifications.

### GLOBAL SERVICE & SUPPORT

With company locations in the United States, United Kingdom, South Africa, Bahrain, and Singapore, TopWorx is strategically positioned to provide out-standing support. In addition, over 200 Certified Product Partners throughout the world are available to provide competent local support when needed.

### WWW.TOPWORX.COM

Visit **www.topworx.com** for comprehensive information on our company, capabilities, and products – including model numbers, data sheets, specifications, dimensions, and certifications.

Valvetop™ discrete valve controllers enable automated on/off valves to communicate via FOUNDATION Fieldbus, DeviceNet, AS-Interface, Profibus, and HART protocols. They attach to all rotary and linear valves and actuators, operate in the most demanding environmental conditions, and carry a variety of hazardous area certifications.

Discrete Valve Controllers for:
• Any bus network
• Any hazardous area
• Any valve or actuator
• Anywhere in the world

TopWorx Valvetop valve control solutions deliver on today's new customer requirements. With the Valvetop program, customers enjoy:

• A complete line of valve controllers and monitors for every protocol, application, environment, and hazardous area.

• The world's leading selection of valve networking products, including FOUNDATION Fieldbus, DeviceNet, AS-Interface, Profibus, and HART.

• 'GO Switch Inside™', the most reliable and durable valve position sensor on the planet.

• Quality products with global agency approvals including IECEX, ATEX, CE, UL, CSA, FM as well as NEPSI, KOSHA, InMetro, and GOST.

• The unmatched process experience and bus networking expertise of TopWorx, the leading provider of valve control and position sensing solutions for the process industries.

# VALVETOP™ D-SERIES
## World-Class Discrete Valve Controllers with the Highest Technology Available

Valvetop D-Series discrete valve controllers are certified for use in every world area. They carry IECEx, ATEX, UL, and CSA certifications in a single model, making it easier for global customers to standardize across plants in multiple world areas. Other certifications available include NEPSI, KOSHA, InMetro, and GOST.

Valvetop D-Series discrete valve controllers can survive in virtually any plant condition. Their heavy-duty construction and corrosion resistance enable superior performance in the most demanding applications.

## The Valvetop D-Series is Built Tough!

Designed to provide reliable service for a lifetime, the Valvetop D-Series has been built to last in the most demanding applications, and endurance tested for over 3.5 million cycles to prove it.

**Wet**
Tested against intense water pressure blasts and complete submersion underwater for ½ hour

**Hot**
Tested for endurance in temperatures up to 176ºF/80ºC

**Cold**
Tested for endurance in temperatures down to -58ºF/-50ºC

**Dirty**
Tested in dust chamber and proven dust tight

**Abusive**
Tested against the "300 pound man step test" and proven impact and step resistant

**Corrosive**
Tested against hundreds of corrosive and caustic elements and proven to resist deterioration or chipping

**Explosive**
Tested by UL for use in explosive environments with no seal-off fittings required (DXP, DXS)

**Chemical Compatibility**
Tested against hundreds of chemicals with varying exposure times, temperatures, and concentrations. Please visit www.topworx.com for specific chemical compatibility information.

" I like the fact that the D-Series has world wide approvals since we have projects throughout the world. "
**- Project Engineer,** Global Engineering Firm

**Visual Display**
- Impact resistant polycarbonate
- Intuitive colors (Green/Red)
- Adjustable/customizable
- Pre-adjusted to 90° for easy installation
- Less than 1 3/4" tall

**Rugged Enclosures for every environment**
- Aluminum, Composite, Stainless
- Up to four conduit entries (English or Metric)
- O-ring seals everywhere
- Buna, Viton, EPDM, Silicone o-ring options

**Pilot Valves**
- Aluminum, 304, 316 Stainless Steel available
- Low Power Solenoid or Ultra-Low Power Piezo
- Single or Dual Coil
- 1.2 Cv or 3.0 Cv
- Integrally mounted for extra protection
- Built-in, 5-micron filter protects the pilots against debris
- Fast, easy troubleshooting:
  - Pneumatic tubing is color-coded for trouble shooting while system is pressurized
  - Troubleshoot valve without removing the cover

**Bus Networking / Sensor options**
- FOUNDATION, DeviceNet, AS-Interface, HART
- GO™ Switch, Proximity, P+F™, Mechanical, 4-20mA Transmitter

**Stainless Steel Shaft & Fasteners**
- ¼" DD or NAMUR Shaft
- Captive cover bolts
- Captive dome screws

**Environmental extremes**
- Operating temperatures from −58°F/−50°C to 176°F/80°C
- NEMA Type 4, 4X, 7 plus IP67

## MULTIPLE D-SERIES PLATFORMS FOR EVERY ENVIRONMENT

**DXP** | Tropicalized Aluminum
Flameproof/Explosion Proof/Intrinsically Safe
Class I Division 1 Groups A-D
Class I Division 2 Groups A-D
Ex ia IIC T4 Tamb
  -40°C to 55°C II2GD
Ex d IIB+H2 T6 Tamb
  -50°C to +60°C II2GD
Ex d IIC T6 Tamb
  -50°C to +60°C II2GD

**DXS** | 316L Stainless Steel
Flameproof/Explosion Proof
  /Intrinsically Safe
Class I Division 1 Groups A-D
Class I Division 2 Groups A-D
Ex ia IIC T4 Tamb
  -40°C to 55°C II2GD
Ex d IIC T6 Tamb
  -50°C to +60°C II2GD
Ex d IIB+H2 T6 Tamb
  -50°C to +60°C II2GD

**SIL-3**
**IEC 61508**

**D-ESD** | Partial Stroke Testing for
  Emergency Shutdown Valves
Suitable for use in SIL-3 applications
Stainless, Aluminum, or Resin
Flameproof/Explosion Proof
  /Non-Incendive
Class I Division 1 Groups C & D
Class I Division 2 Groups A-D
Ex d IIB+H2 T6 Tamb -50°C
  to +60°C II2GD

**DXR** | Composite Resin
Non-Incendive/Intrinsically Safe
Class I Division 2 Groups A-D
Class II Division 2 Groups F & G
Ex ia IIC T4 Tamb
  -20°C to 53°C II2GD
Ex me [ia]IIC Tamb
  -20°C to 44°C T4 II2G

# VALVETOP™ T-SERIES
## High-Value Switchboxes with a Variety of Options

Valvetop T-Series switchboxes deliver outstanding value by providing full functionality in compact, direct-mount enclosures.

Available with a variety of position sensors, integral solenoid valves, and bus networks, the T-Series is suitable for use in all hazardous areas and carry IECEx, ATEX, and CSA certifications.

## The Valvetop T-Series Delivers Outstanding Value!

Designed to provide maximum functionality in a compact form factor, the Valvetop T-Series has a number of unique features that save space, time, and money.
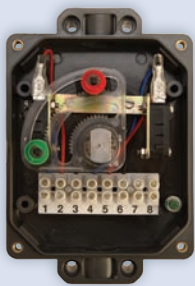
**Optimum Use of Space**
The unique layout supplies ample working space inside the enclosure for wiring and setting of the switches while taking up very little space above the actuator.

**TwistSet™ Cams**
Unique TwistSet cam design allows easy access and accurate stepless setting of sensor position with minimum hysteresis.

Color-coded strikers enable quick identification of open/closed switches.
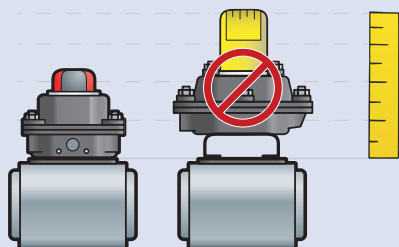
**Low Profile Design**
The unique direct-mounting feature eliminates expensive mounting brackets while reducing the height of the switch-box and the overall footprint above the actuator.
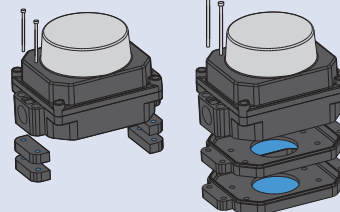
**Direct Mounting**
Unique mounting design enables simple attachment to any ISO/NAMUR actuator without the need for expensive mounting brackets

" I like the features of the T-Series products. The direct mount feature saves money on the cost of brackets. "
**- President,** Valve Distributor

## Solid Enclosures for Every Environment
- Aluminum, Composite, Stainless
- Up to four conduit entries (English or Metric)
- O-ring seals everywhere
- Buna, EPDM, O-ring options

## Environmental Extremes
- Operating temperatures from -40°F/-40°C to 176°F/80°C
- NEMA 4, 4X

## Pilot Valves
- Low Power Solenoid
- Single Coil
- 1.0 Cv
- Integrally mounted for extra protection

## Visual Display
- Impact resistant polycarbonate
- Intuitive colors (Green/Red)
- Pre-adjusted to 90° for easy installation
- Low profile/High visibility
- Customizable

## Bus Networking / Sensor Options
- AS-Interface, Profibus, DeviceNet
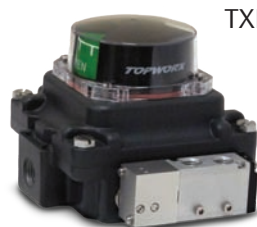- GO Switch, Proximity, P+F, Mechanical

## Stainless Steel Shaft and Fasteners
- NAMUR Shaft
- Captive cover bolts and indicator screws

## MULTIPLE T-SERIES PLATFORMS FOR EVERY ENVIRONMENT



**TVA** Direct-Mount Composite Resin
Intrinsically Safe
General Purpose
Ex ia IIC T4 II2G
  Tamb -40° to 60°C



**TXP** Direct-Mount Aluminum
Flameproof/Intrinsically Safe/
Explosion Proof /Non-Incendive
Class I Division 2 Groups A-D
Class I Division 1 Groups C & D
Class II Division 1 Groups E-G
Ex ia IIC T4 Tamb -50° to 85°C II2GD
Ex d IIB T4 Tamb -50° to 80°C II2GD
Ex d IIC T4 Tamb -50°C to 80°C II2GD



**TXS** Direct-Mount Stainless Steel
Flameproof/Intrinsically Safe/
Explosion Proof /Non-Incendive
Class I Division 2 Groups A-D
Class I Division 1 Groups C & D
Class II Division 1 Groups E-G
Ex ia IIC T4 Tamb -50° to 85°C II2GD
Ex d IIB T4 Tamb -50° to 80°C II2GD
Ex d IIC T4 Tamb -50°C to 80°C II2GD

# VALVETOP™ BUS NETWORKS
## Connectivity to Every Fieldbus Network

## SENSOR-COMMUNICATION MODULES

TopWorx Sensor-Communication Modules are microprocessor based 'brains' that mount inside Valvetop enclosures to deliver position sensing and bus networking functionality to on/off valves. They combine position sensors, bus communications, solenoid outputs, and wiring terminals into a compact, sealed module that drops into various Valvetop enclosures.

**SCM Features:**

• Short-circuit protection

• Resistant to impact, moisture, shock, vibration, contamination

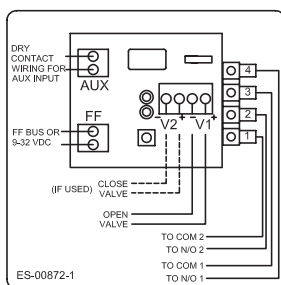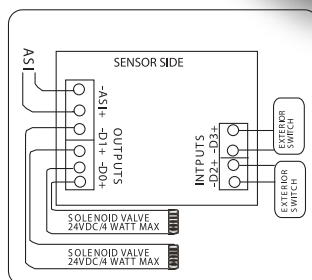• LEDs indicate valve position and facilitate sensor set-up

## BUS NETWORKS

TopWorx Sensor-Communication Modules make it easy to connect automated on/off valves to modern bus networking protocols such as FOUNDATION Fieldbus, DeviceNet, AS-interface, Profibus, and HART.
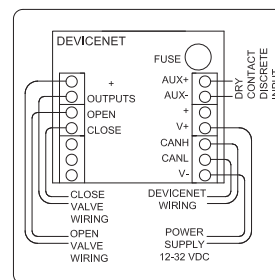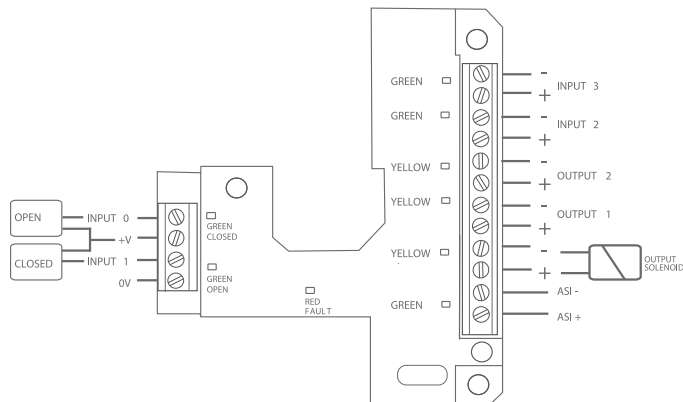



FOUNDATION Fieldbus


ASi


DeviceNet


T-Block

## FOUNDATION FIELDBUS

- 5 Discrete Inputs, 3 Discrete Outputs
- Emerson DeltaV, Honeywell, Yokogawa, Rockwell, Invensys approved

- Pre-defined templates, on-board diagnostics, and early warning LEDs
- Consumes only 17mA to operate, reduces VCRs and DSTs required

- Local calibration button for factory setting of end of stroke switches
- Position feedback via DO read back reduces number of function blocks.

## BEST-IN-CLASS CAPABILITIES

- Reduced number of blocks scheduled on the segment
- Reduced macrocycle times
- Reduced VCR Links (Publisher/Subscriber)

- Reduced DST count
- Higher density of valves per segment
- Less segments required per project (less hardware)

- Pre-Built and Industry Tested Library Modules (reduced engineering)
- Lower Total Cost of Ownership for Intrinsically Safe Applications

**SINGLE DO BLOCK**
Using the Readback function in the DO block for position feedback reduces the number of DSTs required and allows the user to switch the solenoid and get position feedback via this single DO block.

**CALIBRATION SWITCH**
The SCM-FF is equipped with a local calibration button for pre-installation function testing of the valve actuator package. This ensures that all valve automators can function test packages before installation without having to purchase expensive test equipment. LEDs indicate correct position setting of the switches.

**PIEZO TECHNOLOGY**
TopWorx discrete valve controllers incorporate the best piezo technology available on the market today. With a response time of under 50mS and a high flow rate, we ensure the spool valve reacts immediately to a change in signal.



- 3 Discrete Inputs, 2 Discrete Outputs, 1 Analog Input
- Rockwell, Emerson DeltaV approved
- On-board diagnostics and early warning LEDs



- ASi 2.1 with up to 4 Discrete Inputs and 3 Discrete Outputs
- Early warning LEDs



- Profibus DP V0
- 4 Discrete Inputs 2 Discrete Outputs
- Early warning LEDs



- Digital confirmation of analog signal
- Auto-calibration via handheld

# VALVETOP™ POSITION SENSORS
## The Industry's Leading Selection of Position Sensors

Valvetop™ provides the industry's leading selection of valve position sensors, including GO™ Switch leverless limit switches, proximity sensors, mechanical limit switches, potentiometers, and 4-20mA position transmitters.

**SENSORS & SWITCHES**
- GO™ Switch leverless limit switches
- 4-20mA position transmitters with HART protocol
- Proximity
- Reed
- Mechanical

## GO™ SWITCH INSIDE

GO™ Switch leverless limit switches are hermetically sealed and outperform all other position sensors in hot, cold, wet, dirty, abusive, corrosive, and explosive conditions. GO Switches deliver best-in-class capabilities:

- Highest amp rating (4amp/120vac, 3amp/24vdc)
- Highest temperature rating - 80°C
- Up to four GO Switches inside
- Hermetically Sealed contacts
- SPDT, DPDT, and Stainless Steel options
- Proximity operation – nothing to jam, bend, break, or wear out
- Resistant to electrical noise, radio frequency interference, dust, dirt, and most chemicals
- No leakage current, not voltage or polarity sensitive
- Simple device – inherently intrinsically safe with barrier
- Unlike Reed Switches, Gold flashed contacts allow for use in both low and high current applications within a single switch

## PUSHSET CAM

Unique pushset cam design allows quick and accurate setting of the GO Switch positions reducing deadband and hysteresis to a minimum. Switches can easily be set in the mid-position for control applications such as 3-way ball valves or diverter valves.

## 4-20mA POSITION TRANSMITTER

- Fully potted electronic module with LEDs and Auto Calibration feature
- Precise setting of the zero and span can be done in seconds for both CW and CCW rotation with a simple push button
- Position feedback sensor is mounted directly to the switchbox shaft eliminating backlash caused by traditional gear train
- Up to 300° rotation for choke valve applications
- The need for re-calibration is eliminated
- Available with GO Switches and HART Protocol
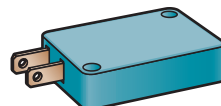
## PROXIMITY SENSORS

Choose from a variety of proximity sensors including reed switches and inductive proximity sensors such as Pepperl+Fuchs™ and others.
- Up to 6 proximity sensors
- AC, DC, Namur versions available
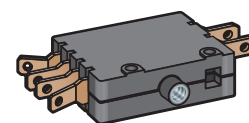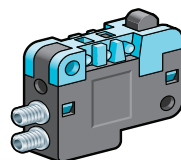
## MECHANICAL LIMIT SWITCHES

- Up to 6 mechanical switches
- 15A/120vac
- SPDT and DPDT contacts available
- Up to 6 mechanical switches

## PNEUMATIC SWITCHES

- Common in marine/shipbuilding industry
- Ideal for explosive or intrinsically safe environments

# VALVETOP™ PILOT VALVES
## Solenoid Valves to Pilot Any Actuator

**valvetop**

Valvetop provides a portfolio of self-contained pilot valves to control pneumatic actuators. These compact, high flow spool valves are all low power and can deliver significant operating cost savings. Integral pilot valve options include solenoid and piezo pilots, aluminum and 316 or 304 stainless steel valve bodies, and pushbutton or palm actuated manual overrides.

**SOLENOID VALVES**
- 24Vdc, 120vac, 220vac
- Aluminum, 316 Stainless, 304 Stainless
- Single Coil, Dual Coil, Blocked Center
- High Flow up to 3.0Cv
- Low Power Consumption (solenoid 0.5 watts; piezo 12mw)
- Low temperature rating -50°C (-58°F) (on request)

### PILOTS

- Internally mounted for protection from the environment
- Low Power Solenoid or Ultra-Low Power Piezo pilots
- Single or Dual Pilots
- Fail open, Fail closed, Fail in last position
- 50 million cycle minimum life
- Class F coil insulation (Class H available on request)
- Response time 10mS

### VALVE BODIES

- Anodized Aluminum
- 316 Stainless Steel
- 304 Stainless Steel

**Flow Rates**
- 1.2 Cv
- 3.0 Cv

### MANUAL OVERRIDES

- Momentary
- Latching
- Manual Reset
  ◦ Prevents accidental opening of a tripped ESD valve
  ◦ Local operator intervention is required before valve can be re-opened

### DUAL VALVE

- Two integral solenoid valves configured in series or parallel
- For applications where a redundant solenoid is required
- For ESD valves or control of 3-position actuators

### MANUAL RESET SOLENOID VALVE

- Designed for Critical Service or Emergency Shutdown Valve applications which often require operators to manually verify a system prior to restarting a process
- Features a 1.2 Cv flow rate and rugged 316 stainless steel housing, ideal for offshore applications

**How It Works**
a) The pushbutton on the Manual Reset solenoid valve is manually pushed and latched. The inward movement of the pushbutton causes the valve to shift.

b) The pilot is then energized, which unlatches the manual pushbutton, but does not change the valve state.

c) When the coil is de-energized, the valve is returned to its original fail-safe mode.
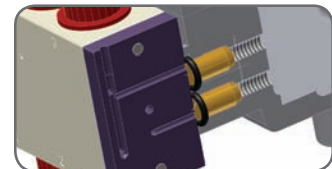
### FLAME ARRESTORS

These double as in line filters, protecting the pilot against damage caused by dirty air. This design also allows the users to replace or work on the external valve in situ without affecting the integrity of the explosion proof enclosure.

TopWorx SIL-3 ESD Valve Controllers provide a complete Partial Stroke Test Solution with unique features and functionality that enable partial stroke testing of emergency shutdown valves without disrupting or shutting down the process.

The **TopWorx Partial Stroke Test Solution** comes complete with:

- Sensor Control Module to partially close the valve without disrupting the process
- Pass/Fail indication via high/low response on the return signal
- Open and Closed position sensors for feedback to the DCS or PLC
- Onboard Diagnostics to enable predictive maintenance and early-warning alerts
- Aluminum, Composite, and 316L Stainless Steel platforms certified for use in Flameproof/ Explosion Proof, or Non-Incendive hazardous areas
- An optional local, lockable partial stroke Test Button integral to the unit

The **TopWorx Partial Stroke Test Solution** provides Onboard Diagnostics to alert the user to the following Dangerous Failures:
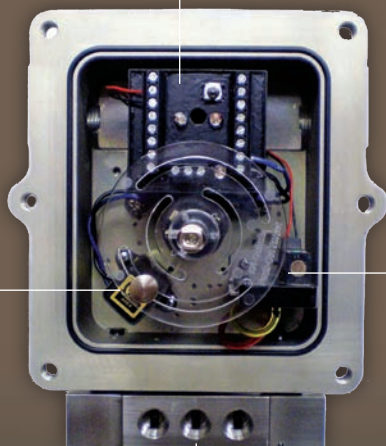- Valve packing/shaft damage
- Actuator spring fatigue/breakage
- Solenoid pilot exhaust blockage
- Solenoid spring failure



Convenient Partial Stroke Testing

Partial Stroke Test Module

GO™ Switch Partial Stroke Confirmation Switch

Integral Solenoid

Spool Valve

valvetop®
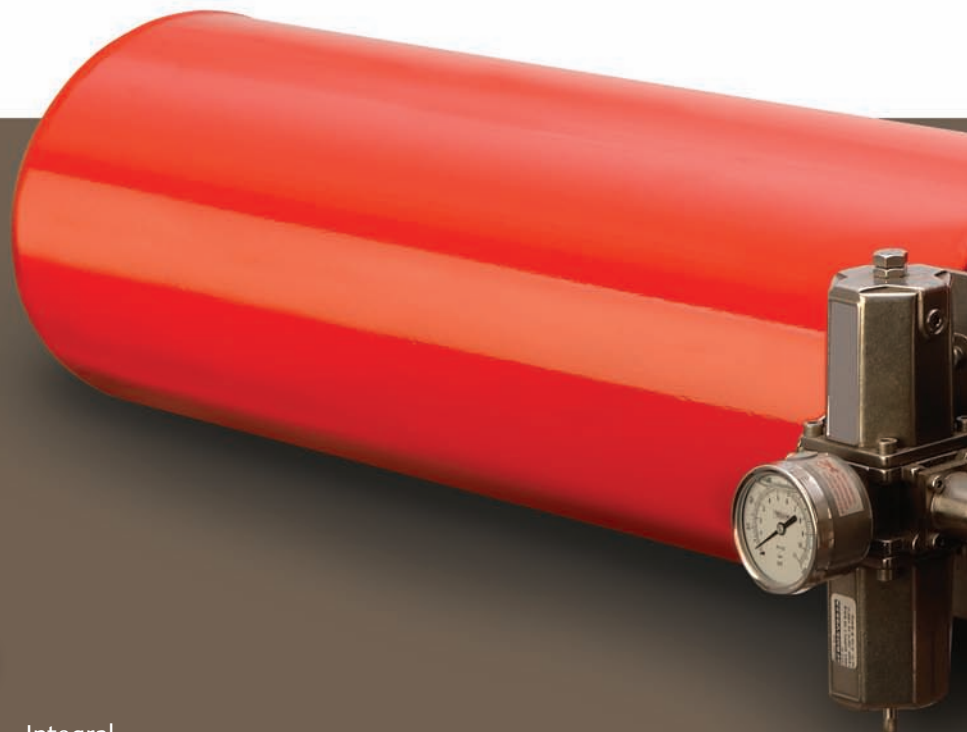
Available in two platforms suitable for your particular application:



**DXP** | Tropicalized Aluminum
Flameproof/Explosion Proof



**DXS** | 316L Stainless Steel
Flameproof/Explosion Proof

**SIL-3**
**IEC 61508**



## Capabilities

• Suitable for use in SIL-3 applications
• Certified for use in all hazardous areas
• Integrated solution with all controls
   in a single housing
• Onboard diagnostics for performance validation

# TOPWORX™ 4310
## Wireless Valve Position Monitor

### More Monitoring Points

The TopWorx™ 4310 Wireless Position Monitor is a component of Emerson's Smart Wireless solutions for field instrumentation. Smart Wireless extends PlantWeb's predictive intelligence into areas that were previously out of physical or economic reach, opening the door for new possibilities in process management. The TopWorx 4310 Wireless Position Monitor sends a wireless feedback signal through the Gateway to indicate valve position, device temperature, and power module status. This non-obtrusive position monitor won't disrupt your existing process and is easy to overlay. The 4310 can be used to monitor equipment such as process valves, regulators, and displacement and float level sensors.

### Ease of Use

Specially designed for the wireless monitoring of open/closed position in linear and rotary valves, no conduit easements or permits are needed for the battery-powered TopWorx 4310 Wireless Position Monitor. This reduces the time needed for installation, setup, and commissioning. The non-contact linkage-less design and multi-language local user interface allows for easy calibration and monitoring. The TopWorx 4310 Wireless Position Monitor is compact, simple to use, and easily mounted on various valves from modulating control to automated quarter-turn or manual. Emerson's Smart Wireless solutions are very scalable. Users can start small and add devices later, improving the network reliability. The more wireless devices on a network, the more reliable the network will become.

### Rugged and Reliable

The TopWorx 4310 Wireless Position Monitor delivers scalable functionality in a small package. Its rugged, engineered resin enclosure and variety of hazardous area certifications make the 4310 a perfect solution for most applications, including those in corrosive or remote environments. The 4310 Wireless Position Monitor is a component of a self-organizing network that is not hindered by obstacles and disruptions. With frequency hopping technologies and redundant paths for information to travel along, the network delivers greater than 99% data reliability. Anti-jamming technology with 128-bit AES encryption, key rotation, authentication, and verification protects the data to give you peace of mind.

### Safe and Cost Effective

The TopWorx 4310 Wireless Position Monitor installs quickly with no wiring or conduit of any kind, reducing not only the cost of installation but safety risks, monitoring time, and labor. Sites that present potential human safety risks may now be monitored easily from a safe location.

AMS® Suite:
Intelligent Device Manager

**Omni-directional antenna**

**Wireless HART Communication Protocol**

**Long life power module**

WirelessHART™ Diagnostics:
- Cycle counter
- Configuration
- Alerts
- Power Status

Modbus or OPC access to device variable information

Control System

Smart Wireless Gateway

**PlantWeb**

**Engineered resin housing**

WirelessHART™ self-organizing network

**4310 Wireless**

**...ALLY OPEN**

**Intrinsically safe design**

**How many devices can be on a single Wireless Gateway?**
Up to 100.

**How many hosts can communicate with a Wireless Gateway?**
Many at the same time. For example: Legacy host systems (PLCs, DCS) and AMS® Device Manager.

**Can you have more than one network?**
Yes, for example when separating areas by function or location.

**What is the maximum spacing between wireless devices?**
75m is typical inside buildings, 200m is typical outside.

## 4-20mA TRANSMITTERS WITH HART PROTOCOL

**HART** COMMUNICATION PROTOCOL

The 2-wire position transmitter with HART will generate a nominal 4-20mA signal proportional to valve position output for full-range actuation of the valve. The transmitter is capable of generating signals below 4mA and above 20mA if the position sensor indicates an out-of-range value. With the added HART digital communication capability, remote calibration and parameter configuration can be performed via a handheld.

Features:
• Remote set point calibration using a handheld device for calibration and monitoring
• Selectable over and under travel settings
• 4 to 20mA variable reading
• Monitoring and setting of alarms with advanced diagnostics. Includes deadband detection, out of range indication and detection of internal memory errors

## THE STAINLESS STEEL, 35-SERIES GO™ SWITCH
**Hermetically-Sealed, Stainless Steel, DPDT Proximity Switch**

For over fifty years, GO™ Switch position sensors have set the standard for reliability and durability in the process industries. Their unique operating principle and best-in-class capabilities have made them the most specified switch in the world for demanding process applications.

**TopWorx™ has once again improved on greatness.**
The 35-Series GO™ Switch is now available in two versions: The original Single Pole Double Throw GO™ Switch or the stainless steel, Double Pole Double Throw, version.

Features:
• One-piece, stainless steel housing
• Hermetically-sealed, Double Pole Double Throw contacts
• Suitable for both Ex d and Intrinsically Safe applications
• Up to four (4) switches in a single enclosure
• Extremely low hysteresis
• PLC and higher current ratings with AC/DC
  - NO/NC wiring flexibility
• 3amp/120vac and 1amp/24vdc
• Available with SOV and HART options
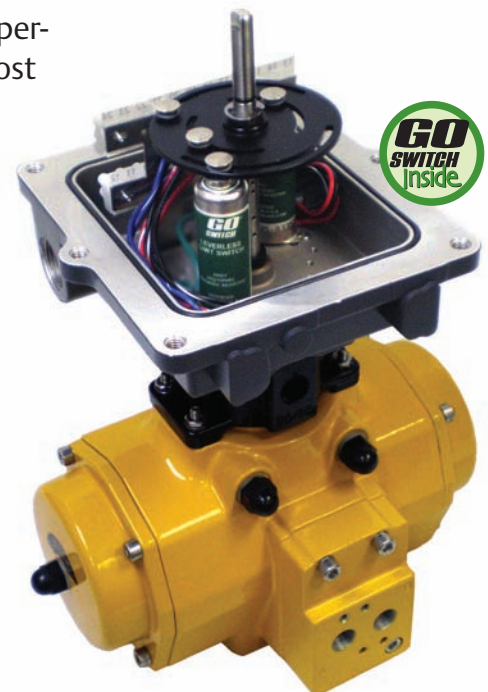
## LINEAR VALVE MONITORS & SENSORS

Valvetop discrete valve controllers are the products of choice for linear valves of all types. Their precision sensing and proven reliability deliver the best position feedback available. Options such as 4-20mA transmitters with end-of-stroke sensors and HART protocol provide continuous monitoring and confirmation of valve position. Custom mounting kits are available to ensure reliable operation for the life of the valve package.

Valvetop D-Series on linear control valves

## DXP WITH IEC/ATEX IIC CERTIFICATION
**The Only IIC Valve Controller with an Integral Solenoid.**

Most ATEX EEx d IIC valve controllers have small containers with screw-top lids and very few options. Often the threads on the screw-top lids bind up, causing safety issues on multiple levels. TopWorx™ is changing all of that with the IIC-certified DXP valve controller.

**There is no competition.**

The unique modular design of the Valvetop™ DXP discrete valve controller combines bus networking, pilot valve and position sensors into a globally certified, explosion proof enclosure that attaches to any automated valve package.

Features:
- Serrated Flange (No binding of threads)
- Improved ingress protection
- IECEX, ATEX, & EEx d Group IIC
- The only IIC Box with integral solenoid
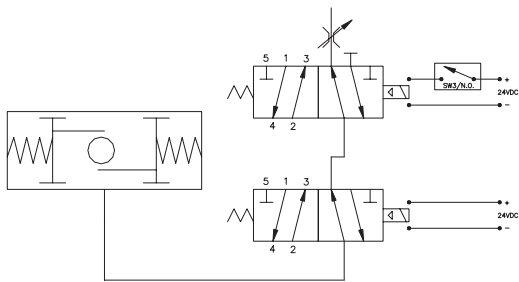- Available with all Bus & Sensor options!

Serrated Flange

Adaptive Conduit Entries
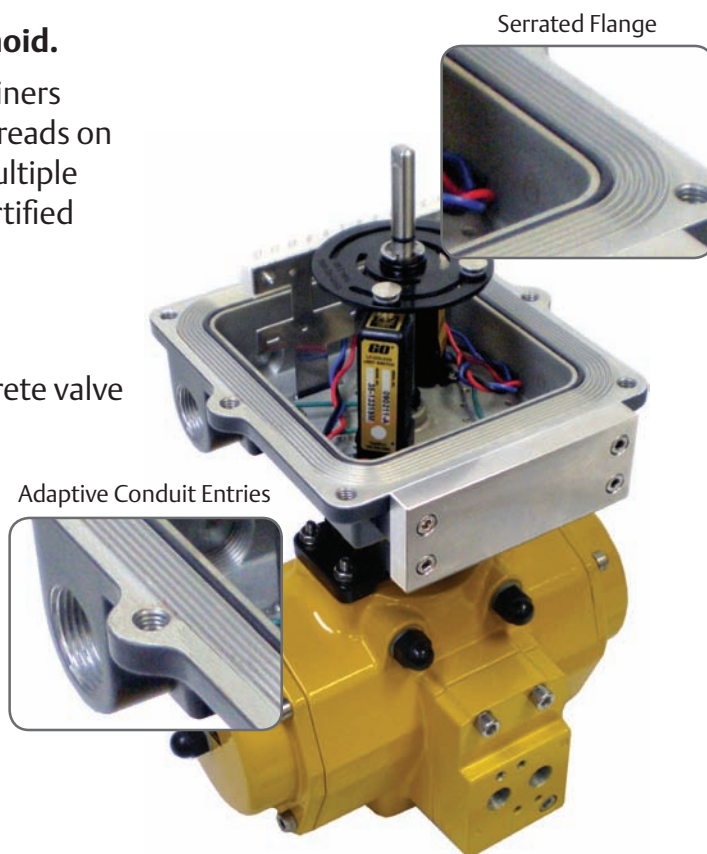
## DUAL PILOT VALVE FOR DRIBBLE FEED CONTROL

By using a unique dual valve option, the solenoids can be configured to allow two stage closing of the valve for applications such as tank filling where the valve needs to be throttled to prevent overflowing.



## MULTI-TURN MANUAL VALVE

Unique adaptor for fitting position monitors to rising stem and non-rising stem gate and globe valves



## VALVETOP VISUAL INDICATORS

A variety of indicators to fit every application, including multiple color combinations such as Green/Red and Yellow/Black, plus three-way, 90° and 180° flow paths. Other languages are also available upon request.



## COLD TEMP TO -50°C/-58°F

The Valvetop D-Series operates at temperatures down to -50°C by using a special cold-temp solenoid configuration



" We replaced all of a competitor's switchbox with the TopWorx Valvetop using GO Switches. We can set the DXPs and walk away from them knowing that they work great. "
**- I&C Leader,** Japanese Chemical Company

" The TopWorx product was attractive to us because the enclosure was resilient and able to survive in a hazardous and corrosive environment. "
**- Process Engineer,** German Chemical Company

# VALVETOP™ MOUNTING KITS
## VIP™ Brackets to Fit Any Rotary Valve or Actuator

## VIP MOUNTING KIT

With over 1,500 mounting kit designs, Valvetop valve controllers can be mounted on any rack-n-pinion, scotch-yoke, or vane actuator, quarter-turn manual valves, linear knifegate and control valves, and positioners. Visit www.topworx.com for a complete list of available kits or to request a custom design.
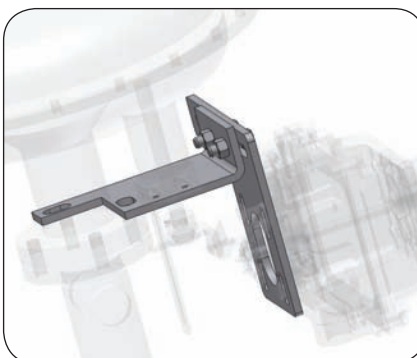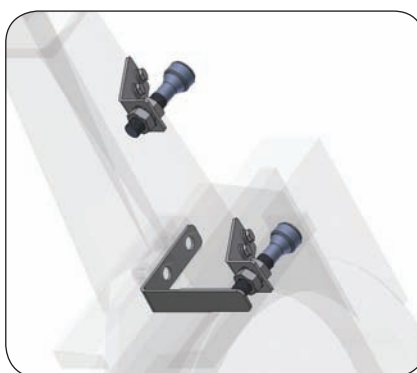
TopWorx has thousands of mounting kits available to fit Valvetop and GO Switch products to a wide variety of valves and actuators. Each kit comes complete with parts list and installation instructions.

| | |
|---|---|
| 3Z Valve | Larox |
| Actreg | Ledeen |
| Airtorque | MAGNETROL |
| ANCHOR DARLING | Marwin |
| Apollo | Masoneilan |
| Automax | Mogas |
| AXELSON | Neles-Jamesbury |
| Baumann | Neway |
| Bettis | Newcon Valve |
| Biffi | Orbinox |
| Bray | Orbit |
| BROOKS BRODIE | PBM |
| Cameron | PBV |
| CCI | Poyam |
| ChemValve | Protech |
| Clarkson | PVC |
| Compaq | QTRCO |
| Conbraco | Radius |
| Contromatics | RCS |
| COPES VULCAN | Remote Control |
| Crane | RF Technologies |
| DeZurik | Rhino |
| Durco | Rotork |
| El-O-Matic | SAMSON |
| Fabri Valve | Severn Glocon |
| Fisher | SPEAKMAN |
| Flowbus | TBV |
| Flowserve | Triac |
| General Valve | Trutorq |
| Grinnell | Unitorq |
| HAWS | Valtek |
| HONEYWELL | Valvtechnologies |
| Hytork | Vanessa |
| ITT | Velan |
| KENNETH ELLIOT | VTI |
| Keystone-Morin | Watts |
| Kinetrol | WKM |
| Kitz | Worcester |
| KTM | Xomox-Matryx |
| KTM | |

## D-SERIES DIAGRAMS

DXP

DXS



MINIMUM 2.5" [63.5] REQUIRED CLEARANCE
IN ORDER TO DISENGAGE THE SHAFT FROM THE ID BUSHING
AND REMOVE LID WHERE OPTIMUM CONDITIONS APPLY

6.21 [157.8]
4.52 [114.7]
.85 [21.6]
2.10 [53.3]

MOUNTING SURFACE

SHAFT TYPE OPTIONAL
SEE SHAFT DETAIL
SECTION

OPTIONAL CONDUIT ENTRIES
USED ONLY WHEN 4 ENTRIES
ARE SPECIFIED

2.13 [54.0]

6.65 [168.9]
3.85 [97.8]
6.76 [171.8]
2.19 [55.5]
2.25 [57.2]

OPTIONAL CONDUIT ENTRIES
BOTH SIDES

5/16-18 UNC - 2B
.44 DEEP
2.25 [57.2]

VALVE TYPE OPTIONAL
SEE INTEGRATED PNEUMATIC
CONTROL VALVES SECTION

DXR



MINIMUM 2.5" [63.5] REQUIRED CLEARANCE
IN ORDER TO DISENGAGE THE SHAFT FROM THE ID BUSHING
AND REMOVE LID WIHERE OPTIMUM CONDITIONS APPLY

6.21 [6.2]
4.51 [4.5]
2.10 [2.1]
1.10 [1.1]

MOUNTING SURFACE

SHAFT TYPE OPTIONAL
SEE SHAFT DETAIL
SECTION

2.00 [2.0]

OPTIONAL CONDUIT ENTRIES
USED ONLY WHEN 4 ENTRIES
ARE SPECIFIED

5.03 [5.0]
3.66 [3.7]
6.10 [6.1]
2.25 [2.3]

OPTIONAL CONDUIT ENTRIES

2.14 [2.1]

5/16-18 UNC - 2B
.44DP
2.25 [2.3]

VALVE TYPE OPTIONAL
SEE INTEGRATED PNEUMATIC
CONTROL VALVES SECTION

## T-SERIES DIAGRAMS

TVA



THE MINIMUM CLEARANCE FOR
ADJUSTMENT AND INSPECTION IS 4.5 IN

2.36 [59.9]
3.78 [96.0]

VALVE TYPE
OPTIONAL SEE
INTEGRATED
PNEUMATIC
CONTROL
VALVES
SECTION

.63 [16.0]
1.18 [30.0]
3.88 [98.4]

STANDARD CONDUIT ENTRY
ON BOTH ENDS

MOUNTING SURFACE

MOUNTING HOLES
FOR M5 SHCS

1.18 [30.0]
.59 [15.0]
2.56 [65.0]
5.75 [146.0]
5.12 [130.0]
Ø2.60 [66.0]
Ø.79 [20.0]

TXP

TXS



MINIMUM 2.5" REQUIRED CLEARANCE
IN ORDER TO DISENGAGE THE SHAFT FROM THE ID BUSHING
AND REMOVE LID WIHERE OPTIMUM CONDITIONS APPLY

VALVE TYPE
OPTIONAL
SEE INTEGRATED
PNEUMATIC
CONTROL VALVES
SECTION

2.95 [74.9]
4.59 [116.7]
1.60 [40.7]
.71 [18.0]
4.92 [125.0]

CONDUIT ENTRIES
ON BOTH ENDS

MOUNTING SURFACE

MOUNTING HOLES
FOR M5 SHCS

1.18 [30.0]
.59 [15.0]
5.12 [130.0]
2.56 [65.0]
5.18 [131.6]
5.73 [145.6]

OPTIONAL CONDUIT ENTRIES
ON BOTH SIDES WITHOUT
VALVE OPTION
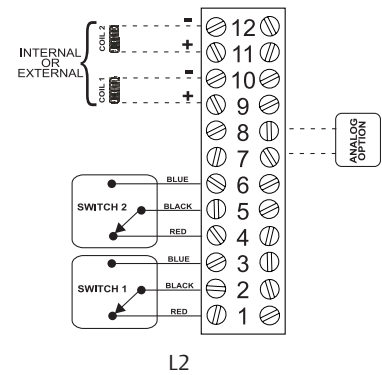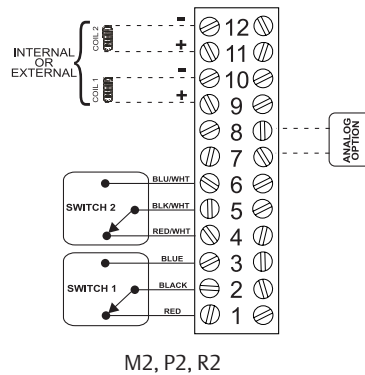
## DRY-CONTACT POSITION SENSORS

Electrical ratings:
- L (GO Switch): 4amp/120vac, 3amp/24vdc
- P (Hi-Amp Prox): 3amp/120vac, 2amp/24vdc
- R (Low-Amp Prox): .2amp/30vdc
- M (Mechanical Switch) 15A/120vac
- _X (4-20mA Transmitter) 8.5-34vdc

M2, P2, R2          L2

## INDUCTIVE PROXIMITY SENSORS

- Available with all types of inductive proximity sensors, including Pepperl & Fuchs™, IFM™, and Turck™
- 3-Wire PNP/NPN:
  : Voltage: 10-30vdc
  : Power Consumption: 15mA
  : Operating Current: 0- 200mA
- 2-Wire N/O & N/C
  : Voltage: 5-250vac/vdc
  : Power Consumption <0.5mA
  : Operating Current: 0- 200mA
- Namur Output:
  : 8vdc
  : Current consumption:
  : Switched: <1mA
  : Unswitched: >3mA

Namur/2-Wire          3-Wire PNP
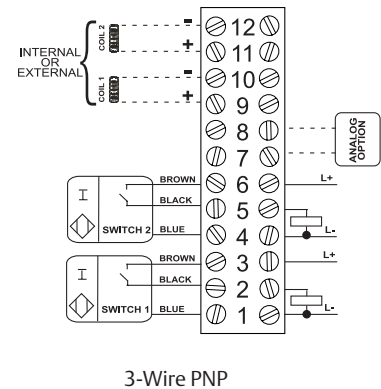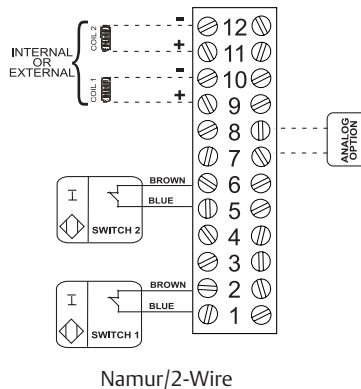
## SOLENOID VALVES

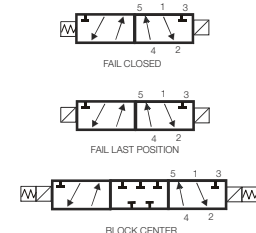Pressure rating: 30-100psi (2 - 8 bar)
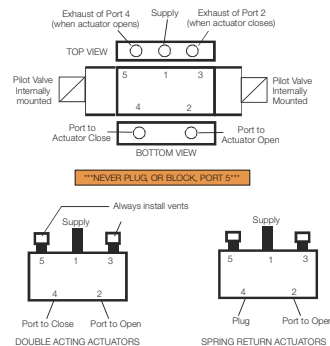Temperature rating:
- Standard -20°C - +60°C
- Low Temp: -50°C to +60°C
- Standard Piezo: -20°C to +60°C
- Cold Temp. Piezo: -30°C to +60°C
Power consumption:
- Standard: 0.5Watts
- Piezo: 12mWatts
Voltages:
- 12/24vdc
- 110vac
- 220vac

# VALVETOP™ ORDERING GUIDE

## Choose one option from each category to build a complete model number.

---

### Enclosure

**D SERIES**

✓ **DXP Tropicalized Aluminum**

✓ **DXR Composite Resin**
("S" Silicone O-Rings only; Stainless steel conduit entries required for North American Approvals)

**DXS 316L** Stainless steel

**T SERIES**

✓ **TXP Aluminum**

**TXS 316 Stainless Steel**

✓ **TVA Engineered Resin**
(Area Class must be W or 0)

**Ordering Guide** Fill in each box to create a complete model number.

---

### Bus/Sensor

**AS  AS-Interface**
(Area class cannot be 0)

✓ **FF  FOUNDATION Fieldbus**
(D-Series only; Pilot P or R)

**DN  DeviceNet**
(Area class cannot be 0)

**PB  Profibus DP** (T-Series only; Area class must be 1, C or W)

**Partial Stroke Test**
**ES**  ESD/PST Module w/GO Switch
(D-Series only; Area class cannot be 0 or 2)

**GO Switches**
✓ **L2**  (2)GO Switches SPDT hermetic seal
**L4**  (4)GO Switches SPDT hermetic seal
(D-Series only)
✓ **Z2**  (2)GO Switches DPDT hermetic seal
(D-Series only)
**Z4**  (4)GO Switches DPDT hermetic seal
(D-Series only)

**Mechanical Switches**
(Area class cannot be 2)
✓ **M2**  (2)Mech SPDT
**M4**  (4)Mech SPDT
**M6**  (6)Mech SPDT (D-Series only)
**T2**  (2)Mech DPDT
**K2**  (2)Mech SPDT gold contacts
**K4**  (4)Mech SPDT gold contacts

**Proximity Switches**
**PN**  (2) SPDT Module w/o LED's, 1A max
(D-Series only)
**PS**  (2) SPDT Module w/LED's, 250mA max
(D-Series only)
✓ **R2**  (2) SPDT 250mA max
(T-Series only)
**R4**  (4) SPDT 250mA max
(T-Series only)
**P2**  (2) SPDT 3A max
(T-Series only)

**Inductive Sensors**
**E2**  (2) p+f NJ2+V3-N inductive NAMUR
**E4**  (4) p+f NJ2+V3-N inductive NAMUR
(D-Series only)
**12**  (2) Ind prox PNP N/O
(T-Series only Area class cannot be 0)

**Analog Output**
(Available with 2-switch options only for L,Z,M,K,E,T)
**_X**  4-20mA transmitter
**_H**  4-20mA transmitter with HART
(Not available with switch option T)

---

### Area Classification

**D SERIES**
✓ **0**  Intrinsically safe
(Bus/sensor cannot be AS, DN, ES, or _X; Requires appropriate I.S. barrier)
- North America
Class I Div 1&2
Grps A, B, C, D
Type 4, 4X
- ATEX/IECEx
Zone 0
II1G, II2D, II2GD
Ex ia IIC
Ex tb IIIC, Db IP6X
(IP67 for DXP/S and IP64 for DXR)

✓ **1**  Explosion proof/Flame proof  (DXP/S only)
- North America
Class I Div 1&2 Grps C, D
Class I Div 2 Grps A, B, C, D
(Groups A & B must be hermetically sealed)
Type 4, 4X, 7
- ATEX/IECEx
Zone 1
II2G, II2GD
Ex d IIB+H2
Ex tb IIIC Db, IP67
(O-Rings must be S or E for DUST certification)

✓ **2**  Non-incendive
(Bus/sensor must be L, Z, P, AS, FF or DN)
- North America
(DXR Only)
Class I Div 2
Grps A, B, C, D;
Class II Div 2 Grps F,G
- ATEX (DXP/S only)
II3G Ex nC tD, IP67
(O-Rings must be S or E for DUST certification)

**G**  General Purpose (DXR only)
Type 4, 4X

**C**  Flameproof (DXP only; Conduit entries must be E or M)
ATEX/IECEx II2G, II2GD
Ex d IIC Ex tb IIIC Db, IP67

**W**  No approvals
IP67 for DXP/S
IP64 for DXR

**T SERIES**
**0**  Intrinsically safe
ATEX Zone 1 II2GD Ex ia IIC
Ex tb A21, IP67 (TXP/S only)
II2G Ex ia IIC, T4 (TVA only)

**C**  Flame Proof (TXP & TXS w/o pilot valve only)
ATEX/IECEx II2GD Ex d IIC
Ex tD A21, IP67

✓ **1**  Flame proof/Explosion Proof
(TXP / TXS only)
- North America
Class I Div 1 Grps C, D
Class I Div 2 Grps A-D
Class II Grps E, F, G
Type 4X, IP 67
- ATEX/IECEx
Zone 1
II2GD Ex d IIB & IIC
Ex tD A21, IP67

✓ **2**  Non-incendive
(TXP/TXS only)
Cl I Div 2 Grps A-D
Cl II Div 2 Grps F&G
ATEX II3GD (Not available with all sensing options)
Ex nA IIC, IP67; Ex tD

**G**  cCSAus General Purpose
(TXP/TXS only)

✓ **W**  No approvals
Nema 4, 4x IP67

---

### Visual Display

✓ **G**  Standard 90° Green OPEN, Red CLOSED

**B**  90° Black OPEN, Yellow CLOSED

**Y**  90° Yellow OPEN Black CLOSED

**J**  3 Way T Port, Green/Red
(T-Series only)

**K**  3 Way L Port, Green/Red
(T-Series only)

**1**  3 way, 90°
(D-Series only)

**3**  3 way, 90°
(D-Series only)

**5**  3 way, 90°
(D-Series only)

**7**  3 way, 180°
(D-Series only)

**9**  3 way, 180°
(D-Series only)

**F**  Flat-top w/ skirt indicator
(TXP/TXS only)

---

| Enclosure | Bus/Sensor | Area Classification | Visual Display |
|---|---|---|---|
| ___ ___ ___ | ___ ___ | ___ | ___ |

## Shaft

✓ **S** 1/4" DD 304 SS (D-Series only)

✓ **N** NAMUR 304 SS

**L** 1" Extended Linear Shaft (TXP/TXS w/ Visual Display F only)

**R** 1/4" DD 316 SS (Shaft & external hardware) (D-Series Only)

**M** NAMUR 316 stainless steel (Shaft & external hardware) (D-Series Only)

## Conduit

**DXP/DXS**
✓ **E** (2) 3/4" NPT

**4** (2) 3/4" NPT (2) 1/2" NPT

**M** (2) M20

**3** (4) M20

**6** (4) 3/4" NPT

**DXR**
(Stainless Conduit Entries)

**P** (2) 1/2" NPT

**E** (2) 3/4" NPT

**M** (2) M20

**DXR**
(Resin Conduit Entries)

**A** (2) 1/2" NPT

**B** (2) 3/4" NPT

**C** (2) M20

**T SERIES**

**TXP/TXS**
**P** (2) 1/2" NPT

**M** (2) M20

**E** (2) 3/4" NPT (N/A with Pilot Valve)

**3** (4) M20 (N/A with Pilot Valve)

**4** (2) 3/4" NPT (2) 1/2" NPT (N/A with Pilot Valve)

**TVA**
**A** (2) 1/2" NPT Resin (TVA only)

**C** (2) M20 Resin (TVA only)

## O-Rings

✓ **D SERIES**
**B** Buna-N

**E** EPDM

**S** Silicone

**V** Viton

**T SERIES**
**M** Buna/EPDM mix (TVA) Silicone (TXP/TXS)

## Pilot

✓ **Blank** No pilot devices

✓ **1** (1) 24Vdc pilot, .5W, fail open/closed

**2** (2) 24Vdc pilot, .5W, fail last position (D Series Only)

**4** (1) 220vac pilot, 1.9W fail open/closed

**5** (1) 220vac pilot, 1.9W fail last position (D Series Only)

**7** (1) 110vac pilot, 1.1W fail open/closed

**8** (2) 110vac pilot, 1.1W fail last position (D Series Only)

**P** (1) piezo pilot, fail open/closed (FF only) (D Series only)

**R** (2) piezo pilots, fail last position (FF only) (D Series only)

## Spool

✓ **Blank** No spool valve

✓ **A** Aluminum hard coat anodized

**S** 304 SS (D Series Only)

✓ **6** 316 SS

## Valve Cv

✓ **Blank** No spool valve

✓ **1** 1.0 Cv (1/4" NPT Ports) (T Series Only)

✓ **2** 1.2 Cv (1/4" NPT ports) (D Series Only)

**3** 3.0 Cv (D Series Only) (1/2" NPT ports)

**C** Cold Temp valve 1.0 Cv (1/4" NPT Ports) (D-Series Only) (Sensors L2 and Z2, Pilot must be 1 or 2; Sensor FF, Pilot must be P or R)(O-Ring E or S only; Spool Valve S or 6 only) Bus/sensor L or Z = -50ºC Bus/sensor FF = -30ºC

**8** 1.0 Cv (1/4" BSP Ports) (T-Series Only)

## Override

(All manual override options EXCEPT Option 1 are for D Series only)

✓ **Blank** No override

**1** Single Pushbutton Momentary/Latching

**2** Dual Pushbutton Momentary/Latching

**3** Single Pushbutton Momentary

**4** Dual Pushbutton Momentary

**5** Manual Reset No voltage release latching with pushbutton (Consult factory if used with ES sensor option) (Spool valve must be 6)

**A** Single palm actuator Momentary/Latching

**B** Dual palm actuator Momentary/Latching

**C** Single palm actuator Momentary

**D** Dual palm actuator Momentary

**E** Manual Reset No voltage release latching with palm actuator (Consult factory if used with ES sensor option) (Spool valve must be 6)

**T** Partial stroke test button with lockable cover (Sensor ES only) (Not avail w/ Area Class C) (DXP/S - Conduit Entries 4 or 3 only. DXR - consult factory)

## Regional Certs

**Blank** No Regional Cert

**B** InMetro (DXP/S only)

**N** NEPSI

**R** GOST (Cannot be DXR or TVA)

**F** FISCO (D-Series Only) (Bus/Sensor must be FF; Area Class must be 0)

**K** KOSHA

| Shaft | Conduit | O-Rings | Pilot | Spool | Valve Cv | Override | Regional Certs |
|---|---|---|---|---|---|---|---|
| ___ | ___ | ___ | ___ | ___ | ___ | ___ | ___ |

GLOBAL SUPPORT OFFICES

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

**Asia-Pacific**
1 Pandan Crescent
Singapore 128461
+65 6891 7550
info.topworx@emerson.com

**Europe**
Horsefield Way
Bredbury Industrial Estate
Stockport SK6 2SU
England
+44(0)161 406 5155
info.topworx@emerson.com

**Middle East**
P.O. Box 17033
Jebel Ali Free Zone
Dubai 17033
United Arab Emirates
+9714 8118283
info.topworx@emerson.com

**Africa**
2 Monteer Rd, Isando
Kempton Park
Gauteng, RSA
(27) 011 445 4475
info.topworx@emerson.com

Visit www.topworx.com for comprehensive information on our company,
capabilities, and products – including model numbers, data sheets,
specifications, dimensions, and certifications.

info.topworx@emerson.com

**www.topworx.com**

**About Emerson Process Management**
Emerson Process Management is a powerful, global, single source of process
improvement technology and expertise. We help major companies in
selected industries optimize their plants and processes to achieve higher
quality, greater reliability and faster time to market, while steadily advancing
productivity and profitability. We can build it - providing experienced project
management, engineering and a single point of accountability for the entire
instrumentation and automation system. We can connect it -- seamlessly
integrating people and technology at every level of the process. We can
improve it -- creating more efficient utilization of energy and raw materials.
And we can sustain it -- producing greater reliability, month after month,
year after year. From the field, to the plant, to the bottom line -- where
performance is the question, Emerson is the answer.

**TOPWORX**

**EMERSON**
Process Management

ES-01257-1 R2