valvetop

Technical Guide

Valvetop DXP

Discrete Valve Controller

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

c UL us LISTED ATEX CE Ex

Designed by Customers…

The **Valvetop DXP** is the result of an extensive 'voice of the customer' research process in which three primary concerns of today's customers were identified. Customers relayed that they want:

Reliability – a product that operates safely and reliably in virtually any plant condition

Flexibility – a product that can provide a variety of options to fit any application

Standardization – a product that is suitable for use in every world area

In short, customers want a valve controller flexible enough to meet all their needs in a single model.

TOPWORX

Delivered by TopWorx…

This customer feedback became the design criteria for the revolutionary **Valvetop DXP**. Here's how it measures up:

Reliability

Rugged Design tackles any plant condition

The DXP is built tough for virtually any extreme environment:

- Explosion proof aluminum enclosure
- Tropicalized inside and out
- Withstands chemicals, corrosives, physical abuse, moisture, dust, and dirt

Flexibility

All-in-One Modularity handles any application

The DXP:

- Attaches to virtually any valve or actuator
- Connects directly to any bus network including FOUNDATION Fieldbus, DeviceNet, and AS-Interface
- Offers all major sensors including GO Switch leverless limit switches

Standardization

Global Agency Certifications in a single model

The DXP is tested and approved for use in any hazardous area:

- Zone 0 / Division 1 – Intrinsically Safe
- Zone 1 / Division 1 – Explosion Proof
- Zone 2 / Division 2 – Non-Incendive

DXP Ordering Guide

Ordering Guide Note:

Not all possible combinations of options can be ordered together – please see **www.topworx.com** for complete DXP Ordering Guide

✓ - FastTrack item

Enclosure	Bus/Sensor	Area Classification	Visual Display	Shaft	Conduit Entries	O-Rings	Pilot	Spool Valve	Valve Cv	Manual Override
✓ **DXP Valvetop DXP** Enclosure: Die-cast aluminum; O-ring sealed Coating: Dichromate conversion coating inside and out; epoxy coating outside Cover Bolts: 6 captive socket head stainless steel screws Terminal Strip: Standard 12 pt. molded nylon Operating Temperature: Determined by internal components - Consult Factory Environment: Designed for NEMA Type 4, 4X, 7, 9 IP67	✓ **Bus Networks** ✓ **AS** AS-Interface (Area Class must be 1) ✓ **FF** FOUNDATION Fieldbus (Pilot must be P, R or U) ✓ **DN** DeviceNet (Area Class must be 1) **GO Switches** (Specify quantity: 2 or 4, i.e. L2 or L4) ✓ **L** GO Switches; hermetically sealed SPDT **Mechanical Switches** (Specify quantity: 2, 4 or 6; i.e. M2, M4 or M6) ✓ **M** Mechanical SPDT **T2** Mechanical DPDT **K** Mechanical SPDT - gold contacts **Inductive Switches** (Specify quantity: 2 or 4, i.e. E2 or E4) **E** p+f NJ2-V3-N inductive NAMUR **Analog Output** (Available with 0 or 2 switches for L, M or K only*) **_X** 4-20mA transmitter (0-30°) **_Y** 4-20mA transmitter (0-90° I.S.) **_U** 4-20mA transmitter (0-60°) (works for 45°) **_A** 0-1K Ohm pot. **_B** 0-10K Ohm pot. * Examples: LX = (2) GO Switches with transmitter MA = (2) mech SPDT w/1k Ohm Pot OX = no switches with transmitter **00** No Switches	✓ **0** Intrinsically Safe* Class I, Div.1 & 2, Groups A,B,C,D Zone 0 EEx ia IIC, IP67 ✓ **1** Explosion Proof Class I, Div.1 & 2, Groups C and D, Zone 1 EEx d IIB, IIC, IP67 Consult factory for device T code and operating temperatures. * With appropriate I.S. barrier	✓ **G** Standard 90° Green OPEN, Red CLOSED **Y** 90° Yellow OPEN, Black CLOSED **4** 45° Green OPEN, Red CLOSED **Z** 45° Yellow OPEN, Black CLOSED	✓ **S** 1/4" DD, 304 stainless steel ✓ **N** NAMUR, 304 stainless steel	✓ **E** (2) 3/4" NPT **4** (2) 3/4" NPT (2) 1/2" NPT **M** (2) M20 **5** (2) M20 (2) M16	✓ **B** Buna-N	**Blank** No pilot device(s) ✓ **1** (1) 24Vdc pilot, 6W, fail open/closed **2** (2) 24Vdc pilots, 6W, fail last position **3** (2) 24Vdc pilots, 6W, block center **7** (1) 110Vac pilot, 1.1W, fail open/closed* **8** (2) 110Vac pilots, 1.1W, fail last position* **9** (2) 110Vac pilots, 1.1W, block center* ✓ **P** (1) piezo pilot, fail open/closed (FF only) **R** (2) piezo pilots, fail last position (FF only) **U** (2) piezo pilots, block center (FF only) * Sensor must be L, M, or T	**Blank** No spool valve ✓ **A** Aluminum - black hard coat anodized **S** 304 Stainless **6** 316 Stainless Don't Forget Filtered air is required for proper valve operation. Reference the TopWorx Catalog for additional Air Filter information.	**Blank** No spool valve ✓ **2** 1.2 Cv	**Blank** No override ✓ **1** Single Pushbutton Momentary/ Latching **2** Dual Pushbutton Momentary/ Latching **3** Single Pushbutton Momentary **4** Dual Pushbutton Momentary **A** Single palm actuator Momentary/ Latching **B** Dual palm actuator Momentary/ Latching **C** Single palm actuator Momentary **D** Dual palm actuator Momentary
Enclosure	**Bus/Sensor**	**Area Class.**	**Visual Display**	**Shaft**	**Conduit Entries**	**O-Rings**	**Pilot**	**Spool Valve**	**Valve Cv**	**Manual Override**

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FOUNDATION DeviceNet AS GO

Our Value Promise

TopWorx is the leader in field networking, valve control, and position sensing solutions for the process industries.

We promise to provide:

- Products with superior **quality and value**
- People with leading **experience and expertise**
- Service with outstanding **speed and excellence**

You can count on TopWorx.

ISO 9001 2000 Certified

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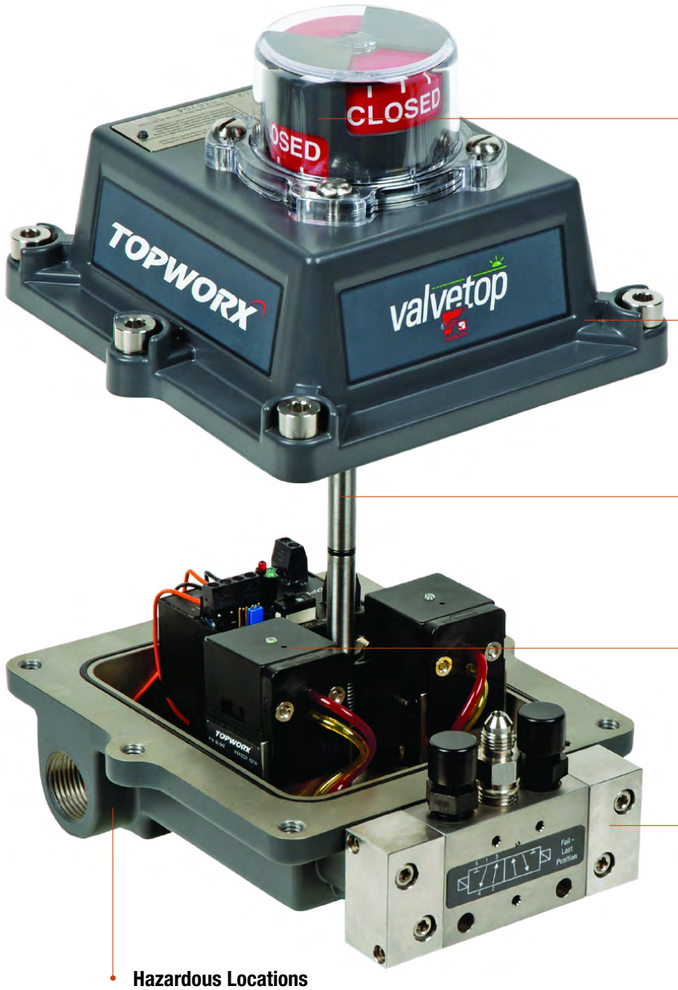
Rugged Design Tackles Any Plant Condition

Today's customers want a product that can survive in virtually any plant condition. With its heavy-duty construction and corrosion resistant coating, the Valvetop DXP is designed to be used in the most demanding applications. Key design features include:



Visual Display
- Impact resistant polycarbonate
- Intuitive colors (Green/Red)
- 360° adjustable/customizable
- Pre-adjusted to 90° for easy installation
- Not too tall

Rugged Aluminum Enclosure
- Up to four conduit entries (English or Metric)
- O-ring sealed everywhere
- Buna, Viton, EPDM, Silicone o-ring options
- Protective coating inside and out

Stainless Steel Shaft and Fasteners
- 1/4" DD or NAMUR Shaft
- Captive cover bolts
- Captive dome screws

Bus / Sensor options
- FOUNDATION Fieldbus, DeviceNet, AS-Interface
- GO Switch, Proximity, Mechanical

Pilot Valves
- Low Power Solenoid or Ultra-Low Power Piezo
- Anodized aluminum, 304 stainless steel, or 316 stainless steel valve bodies
- Single or Dual pilots
- 1.2 Cv or 2.5 Cv flow rates
- Integrally mounted for extra protection
- Built-in 20 micron filter protects pilots against debris
- Fast, easy troubleshooting:
  - Tubing, pilots, and overrides are color-coded
  - Troubleshoot while the system is pressurized
  - Troubleshoot valve and pilot without removing cover

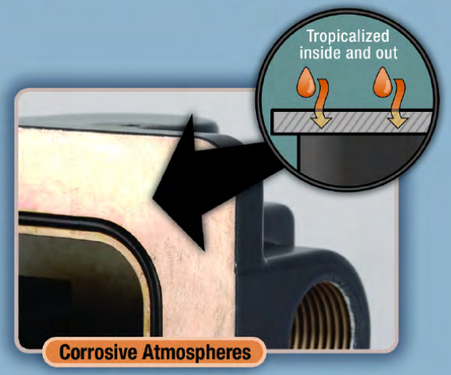
Hazardous Locations
- NEMA Type 4, 4X, 7 plus IP67
- **Intrinsically Safe** Zone 0 EEx ia IIC, II 1 G / Class I Division 1 & 2 Groups ABCD
- **Explosion Proof** Zone 1 EEx d IIB, II 2 G / Class I Division 1 Groups C&D
- **Non-Incendive** Zone 2 / Class I Division 2 Groups ABCD

Key Feature

The Valvetop DXP is Built Tough!

The Valvetop DXP is designed to provide reliable protection for a lifetime. It has been built to last in the most demanding applications, and endurance tested for over 3.5 million cycles to prove it. The DXP is tested tough in the following environments:

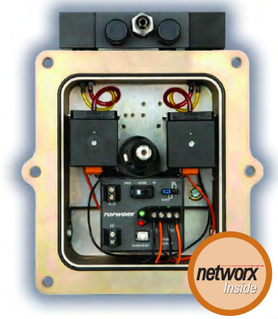
Environment	Tested tough
Hot	Tested for endurance in temperatures up to 176ºF/80ºC
Cold	Tested for endurance in temperatures down to -58ºF/-50ºC
Wet	Tested against intense water pressure blasts and complete submersion 1 meter underwater for 1/2 hour
Dirty	Tested in dust chamber and proven dust tight
Abusive	Tested against the "300 pound man step test" and proven impact and step resistant
Corrosive	Tested against hundreds of corrosive and caustic chemicals with various exposure times, temperatures, and concentrations, and proven to resist deterioration or chipping
Explosive	Tested by UL for use in Class I Division 1 & 2 explosive environments with no seal-off fittings required



All-In-One Modularity Handles Any Application

Today's customers want the flexibility to add the bus networking, sensor, and solenoid options that make the most sense for their unique needs. The Valvetop DXP attaches to virtually any valve or actuator, connects directly to any bus network such as FOUNDATION Fieldbus, DeviceNet, and AS-Interface and offers all major sensors including GO Switch leverless limit switches.

DXP-FF
TopWorx DXP with FOUNDATION Fieldbus
Sensor-Communications Module



Sensors for any application

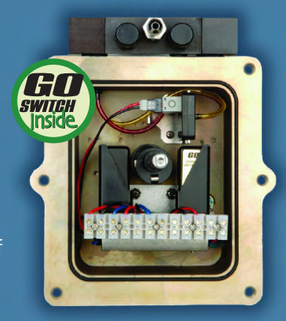
The Valvetop DXP makes it easy to confirm the position of automated on/off valves with a choice of GO Switch leverless limit switches, proximity sensors, or mechanical limit switches.

Connectivity to any bus network

The Valvetop DXP makes it easy to connect automated on/off valves to modern bus networking protocols such as FOUNDATION Fieldbus, DeviceNet, and AS-interface.

Key Feature

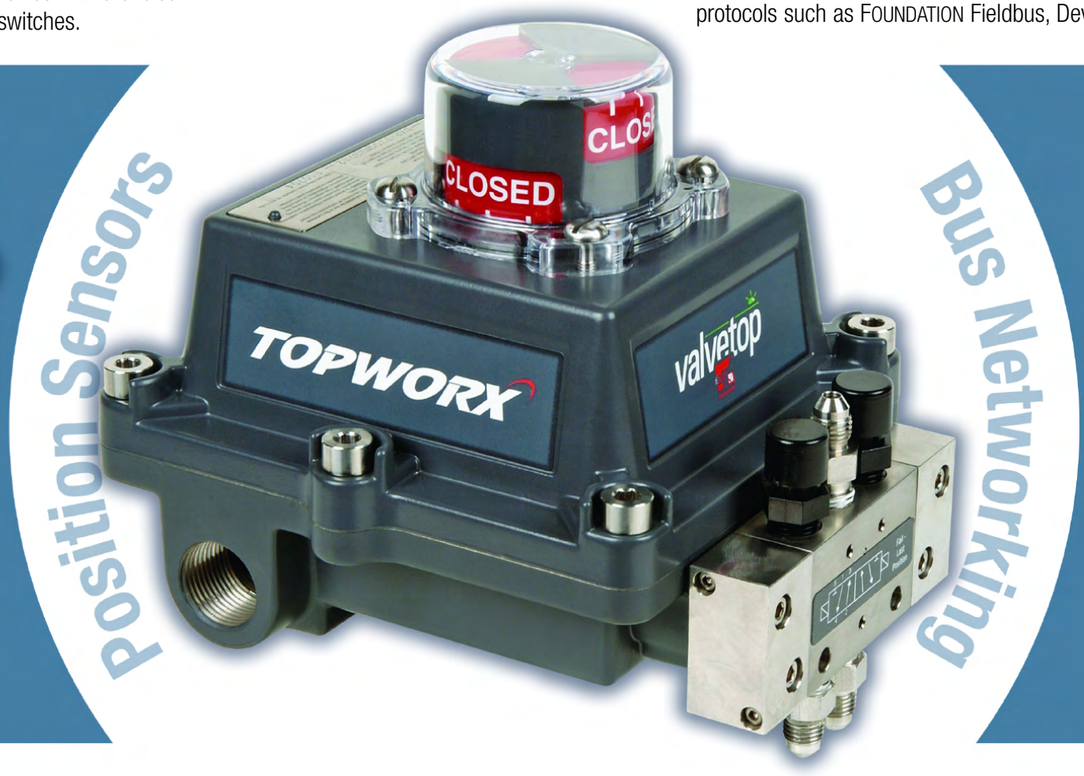
GO Switch Inside!



Most customers prefer the proven quality and performance of GO Switch leverless limit switches. They combine all the advantages of proximity, reed, and mechanical technologies with none of their drawbacks.

GO Switch advantages:

- Hermetically sealed contacts rated 4A/120VAC and 3A/24VDC
- Proximity operation – nothing to jam, bend, break, or wear out
- Immune 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

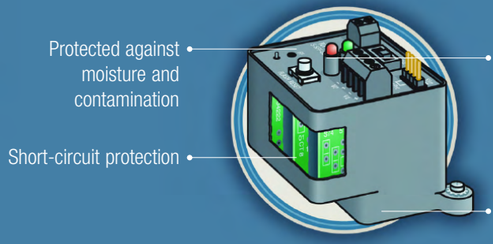


Key Feature

Sensor-Communications Modules

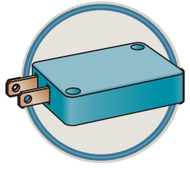
TopWorx Sensor-Communications Modules combine bus networking, position sensors, and terminal points into a compact enclosure that is completely potted and sealed from the environment.

SCM features:



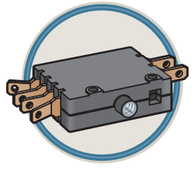
GO Switch Inside
Hermetically sealed GO Switches have set the standard for reliable, durable position sensing in valve monitors.

- Up to 4 GO Switches
- 4A/120VAC, 3A/24VDC
- Hermetically sealed
- Inherently intrinsically safe



Proximity Sensors
Choose from a variety of proximity sensors including reed switches and inductive proximity sensors such as Pepperl+Fuchs.

- Up to 4 proximity sensors
- NAMUR, intrinsically safe options



Mechanical Limit Switches
This option features inexpensive mechanical limit switches with high amp contacts rated to 10 amps.

- Up to 6 mechanical switches
- 10A/120VAC, .5A/125VDC

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
- TopWorx is an Emerson 'Alliance' partner

DeviceNet

- 3 Discrete Inputs, 2 Discrete Outputs
- Rockwell, Emerson DeltaV approved
- On-board diagnostics and early warning LEDs
- TopWorx is a Rockwell Automation 'Encompass' partner

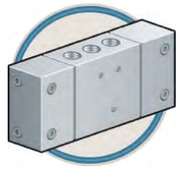
AS-Interface

- ASi 2.1 specification
- Up to 4 Discrete Inputs and 2 Discrete Outputs
- BriteLite LEDs to indicate Open/Closed and facilitate initial setup

All-In-One Modularity Handles Any Application (continued)

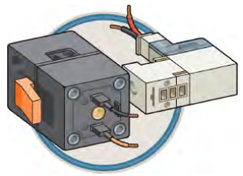
Pilot Valves to control any actuator

The Valvetop DXP includes a portfolio of self-contained pneumatic pilot valves to control pneumatic actuators. These compact, high flow spool valves are all low power or ultra low power and can deliver significant operating cost savings.

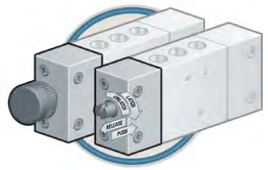


Valve Bodies
- Anodized Aluminum
- 316 Stainless Steel
- 304 Stainless Steel

Valve Configuration
- 5 port / 4 way



Pilots
- Internally mounted for protection from the environment
- Low Power Solenoid
  - 24Vdc / 0.55W
  - 110Vac / 1.1W
- Ultra-Low Power Piezo
  - 24Vdc / 5-15mW
- Single or Dual Pilots in the following configurations:
  - Fail open/closed
  - Fail in last position
  - Blocked center



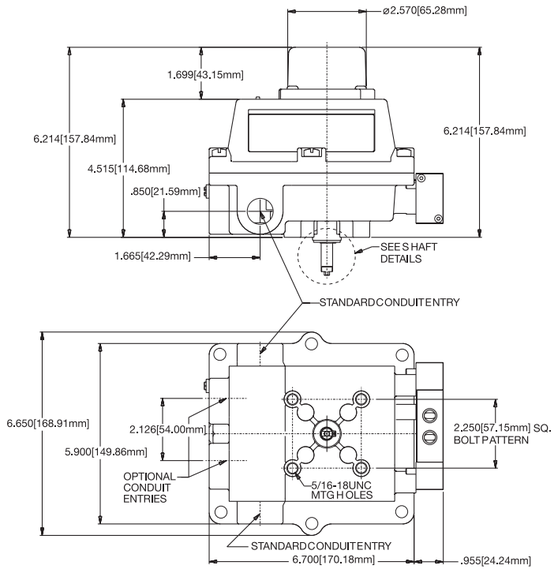
Manual Overrides
- Momentary
- Latching
- Push button
- Palm button

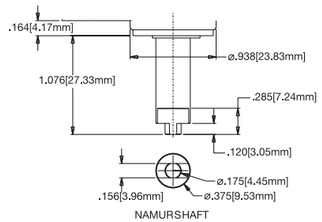
Flow Rates
- 1.2 Cv
- 2.5 Cv

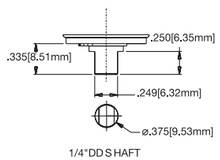
Mounting Kits to fit any automated valve

With over 1,500 mounting kit designs, the Valvetop DXP can be mounted on rack-n-pinion, scotch-yoke, or vane actuators, quarter-turn manual valves, linear control valves, and positioners.

Dimensional Drawings

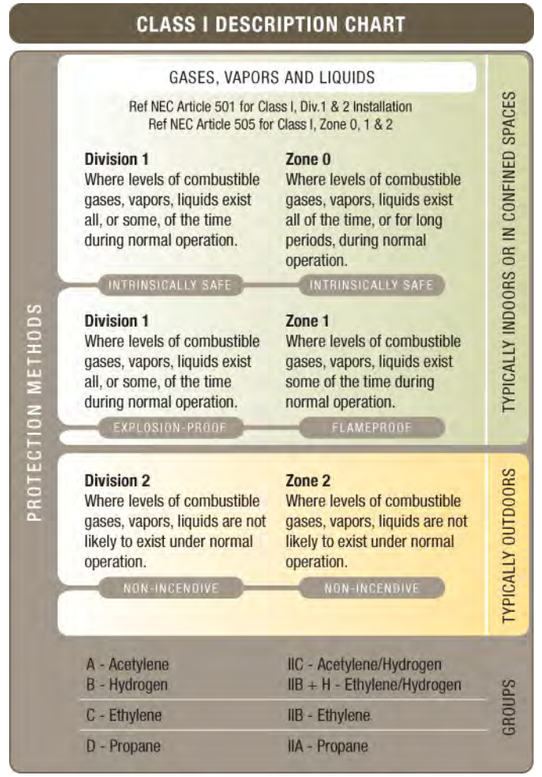






Global Certifications in a Single Model

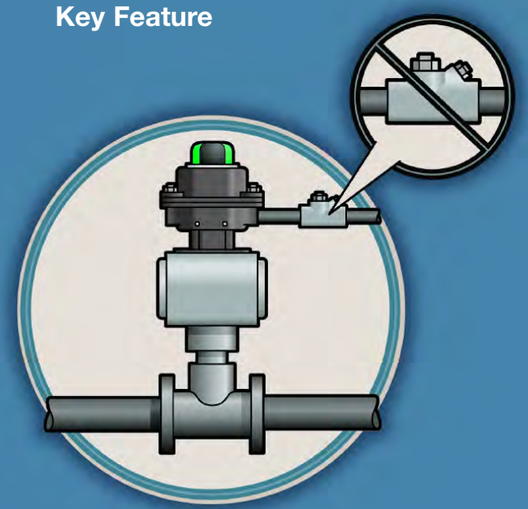
Today's customers want a product that is certified for use in every world area. Worldwide, the Valvetop DXP carries c-UL-us, ATEX, and other certifications in a single model, making it easier for global customers to standardize across plants in multiple world areas.



Valvetop DXP Certifications
- Intrinsically Safe Zone 0 EEx ia IIC, II 1 G / Class I Division 1 & 2 Groups ABCD
- Explosion Proof Zone 1 EEx d IIB, II 2 G / Class I Division 1 Groups C&D
- Non-Incendive Zone 2 / Class I Division 2 Groups ABCD

c UL us LISTED ATEX CE Ex

Key Feature



The Valvetop DXP requires no seal-off fittings in Division 1 or 2 hazardous areas

For explosion proof devices in Division 1 or 2 areas, the National Electric Code typically requires conduit "seal-off fittings" be installed within 18" to prevent the spread of ignited gases through the conduit system. These seal-off fittings usually cost an estimated $75-$100 per device to purchase and install.

In response to customers looking for a simpler, less expensive way to install field devices in hazardous areas, TopWorx designed the Valvetop DXP to operate safely without seal-off fittings in Division 1 or 2 areas. Special "pressure piling" tests have proven the DXP can both withstand and contain explosions. As a result, **the DXP has been c-UL-us certified for use in Division 1 or 2 areas with no seal-off fittings required – delivering installed cost savings of $75-$100 per device!**