



DVC-ASi Discrete Valve Controller

DVM-ASi Discrete Valve Monitor

Version 2.1

TopWorx discrete valve controllers integrate sensors, bus communications, pilot valve, and termination points into a variety of enclosures, delivering the ultimate in modularity.



- Direct Mount with no brackets
- Zone 2 (CI I, Div 2)
- 2 DI and 2 DO
- Seamless integration with Networx products

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Lumitech DVC-ASi & DVM-ASi

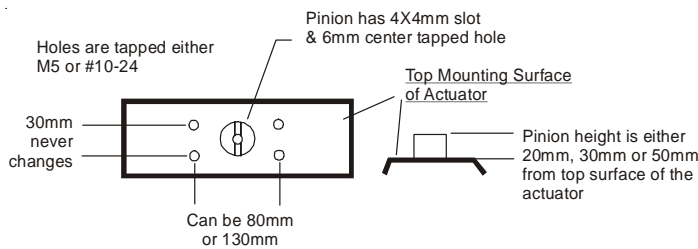
ISO 5211/NAMUR Actuator Accessory Mounting

The TopWorx Lumitech DVC and DVM product line is a AS-Interface compatible direct mount valve control and/or monitoring package for any ISO5211/NAMUR actuator.

Though specifically designed for direct interface with ISO 5211/NAMUR accessory mounting dimensions, the unit can be used on nearly any non-NAMUR actuator utilizing one of TopWorx's VIP Bracket Kits. Our bracket kits are manufactured in-house from stainless steel flat and bar stock, providing superior stability and corrosion resistance for the life of the product. These mounting kits may be found in the VIP Mounting Kits section of the TopWorx Process Automation Solutions Pricing Guide (publication L-L106), attainable through our distribution network, or on-line at www.topworx.com.

See Figure 1 below for the ISO 5211/NAMUR accessory mounting standard.

Figure 1
ISO 5211/NAMUR standard



Since the Lumitech unit is designed for direct mounting to ISO 5211/NAMUR actuators, you will realize a cost and labor savings on projects since there are no mounting brackets to purchase or install.

Table 1 - Enclosure / Target Materials of Construction

Enclosure / Target Materials of Construction	
Enclosure Body and Lid	Polybutylene Teraphthalate (PBT) / Polycarbonate Blend
LED Lens	Polycarbonate
Enclosure O-ring	Silicone
All Enclosure Inserts	Stainless Steel
Spool Valve Manifold Gasket	Silicone
Target Core and Target Rings	Polybutylene Teraphthalate (PBT) / Polycarbonate Blend
Dome	Polycarbonate

Mechanical Installation Procedures

Your Lumitech package comes complete with all necessary fasteners for mounting to any ISO/NAMUR actuator. The holes on the top accessory mounting pad are tapped either M5 or #10-24 (see Figure 1 above), both of which are included in the hardware package.

Reference Figure 2 for all steps below.

Step 1

Thread the M5 or #10 stud into the holes on the top surface of the actuator on the same side as the air ports of the actuator. Tighten the studs using good mechanical practices. The enclosure is designed to be transversely mounted to the length of the actuator.

When mounting the unit using the 80mm spaced holes, the crescent shaped spacer must be used under the enclosure.

Step 2

Slide the enclosure mounting feet over the installed studs and secure with the washers and nuts provided.

Step 3

Attach the Drive Cup to the actuator pinion. Align the tang on the bottom with the slot in the actuator pinion.

Step 4

To install the target assembly, first determine the position of the valve. Typically, a valve is in the CLOSED position when received new. Slide the target assembly (Core Indicator and Target Rings) over the Drive Cup with one of the Red "Closed" quadrants facing the enclosure body. Push the assembly down until it bottoms out.

Step 5

Install the Dome with the captured screws through the enclosure lid.

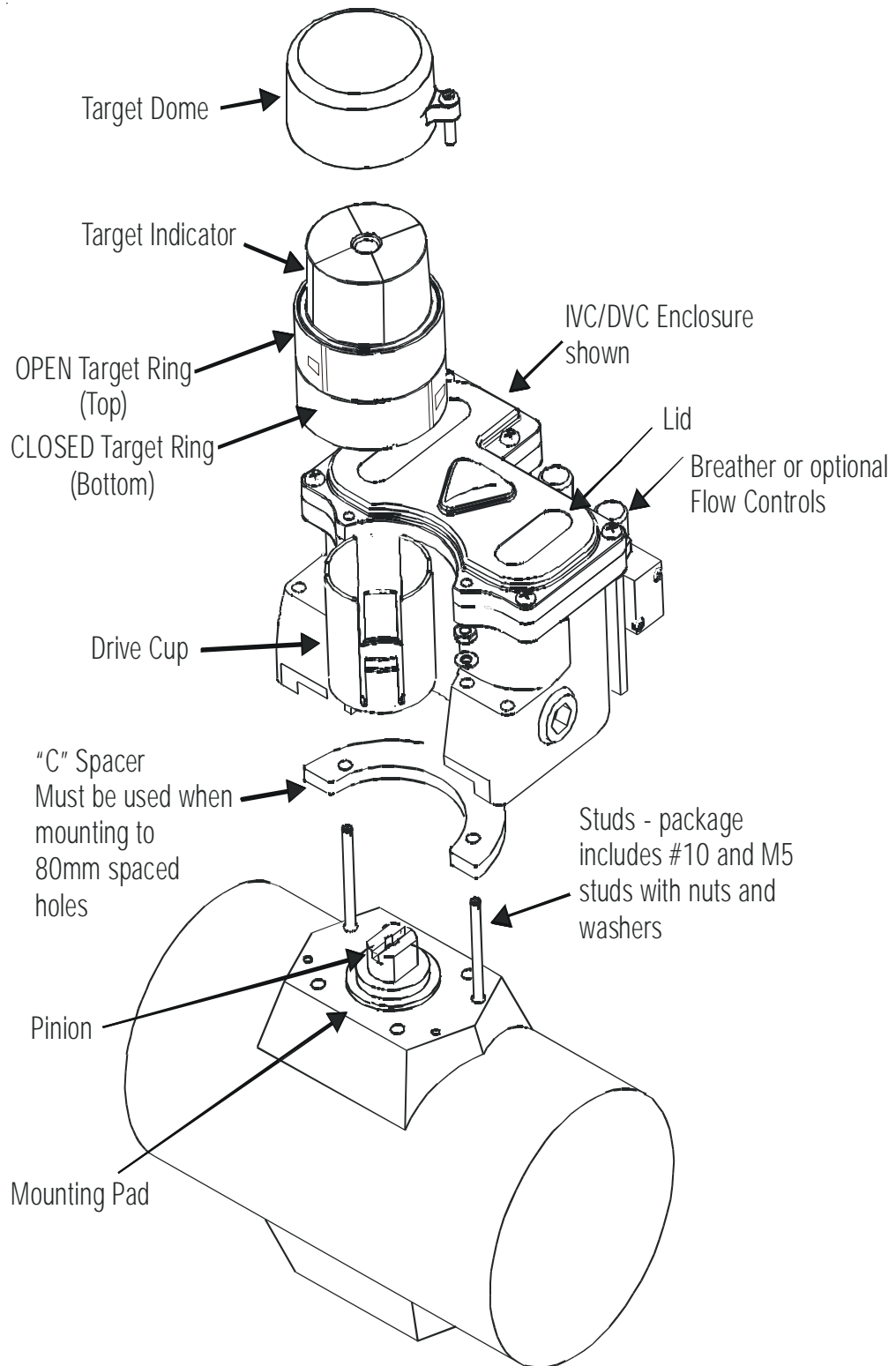


This product comes shipped with plastic plugs in the conduit entries in an effort to protect the internal components from debris during shipment and handling. **It is the responsibility of the receiving and/or installing personnel to provide appropriate permanent sealing devices to prevent the intrusion 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.

Figure 2. Mechanical Installation Exploded View



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.

4-Way Spool Valves

The TopWorx spool valve is a 5 port, 4-way valve driven by an internally mounted pilot valve. The electrical hookup of the pilot is covered in the AS-i Specification section. The spool valve supply port and work ports are 1/4" NPT. The exhaust ports are 1/8" NPT, marked as follows for the DVC:

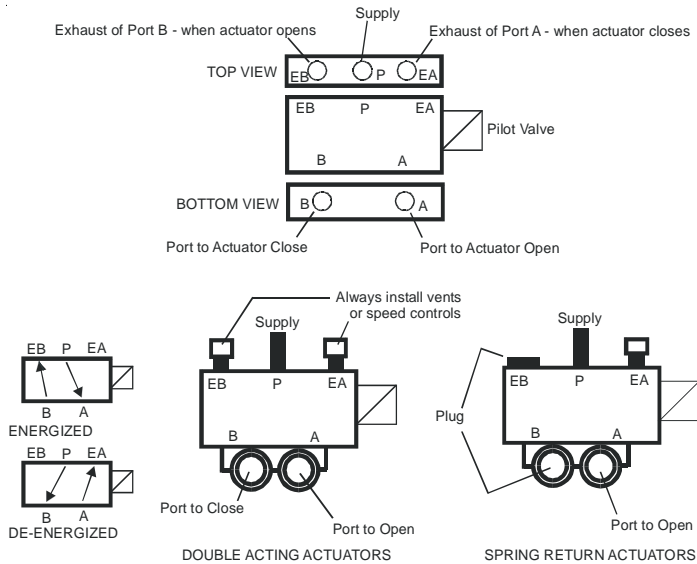


Figure 3

Highly Recommended

TopWorx highly recommends Loctite 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.

Flow controls (AL-M21) or Breathers (AL-M31) should be installed in the exhaust ports to keep debris from falling into the spool valve and damaging the seals. This needs to be addressed prior to installation, or storage.

Don't forget!

TopWorx has a complete line of breathers, flow controls, regulators and filters.

Check out www.topworx.com or call us at 502.969.8000 for more details

Table 2 - Spool Valve Specifications

Spool Valve Specifications	
Medium	Dried/filtered air (5 micron)
Max Operating Pressure	100psi (0.7 MPa)(6.89 Bar)
Min Operating Pressure	30psi (0.21 MPa)(2.07 Bar)
Ambient Temperature Range	22° to 122°F (-5° to 50°C)
Flow Coefficient	1.2 Cv
Environment Rating	Type 4, 4X, IP56
Port Size	1/4" NPT(Supply & Work), 1/8" NPT(Exhaust)
Pilot Operator Manual Override	Non-Locking Push Type
Valve Body	Diecast aluminum, dichromate and / or epoxy coating. Stainless steel option.
Valve Seals	Buna-N

Table 3 - AS-i Specifications

AS-i Specifications	
Device ID	A Free Profile
Device I/O	B 2 Inputs / 2 Outputs
Inputs	
D2 Open Limit Switch	0 Switch Open
D3 Closed Limit Switch	1 Switch Closed
Outputs	
D1 Solenoid #1 (Close)	0 De-energize Solenoid
D0 Solenoid #2 (Open)	1 Energize Solenoid
Current	DVC max current = 65mA DVM (40mA + open solenoid current + closed solenoid current) Max solenoid current = 160mA per output (Max power = 4 watts per output)
Voltage	20 to 30VDC



NOTE: When upgrading a TopWorx AS-i module with a new TopWorx AS-i 2.1 module, make sure the input and output data bit positions are updated as indicated above.

Solenoid Note: Integral mount solenoid in the DVC is 0.67W. For any externally mounted, or customer supplied, solenoid valve 4 watt maximum power consumption is allowed. A 160 mA max surge current limitation is required to prevent activation of the short circuit protection.

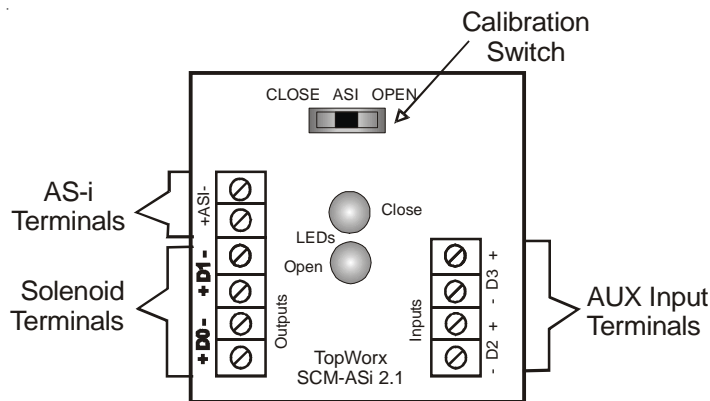


Figure 4. SCM-ASI
Sensor Communication Module

3.0 DVC Wiring

Step 1

Wire to Terminals '+' and '-' for the integrated or external solenoid valve to the terminals marked +D0- and +D1-. The integrated coil has an LED indicator for power verification. **Note: For an externally mounted solenoid valve, 4 watt maximum power consumption is allowed. A 160 mA surge current limit is required to prevent activation of the short circuit protection circuit.**

Step 2

Wire AS-i communication wiring to terminals AS-i '+' and AS-i '-'. (See Figure 4 for wiring diagram) **Note: For calibration of the target, a 24 VDC power supply may be used instead of an ASI Controller. If an ASI Controller is not available, wire +24 VDC to ASI+, and GND to ASI-. The calibration switch will still be able to activate the valve.**

4.0 DVM Wiring

Step 1

For externally mounted limit switches wire in the switches to the terminals marked -D2+ for the open switch and -D3+ for the closed limit switch.

Contact TopWorx to see our selection of diagnostic tools designed to reduce the total cost of ownership of AS-i networks and devices.

Our handheld AS-i addressing unit can reduce startup and commissioning time by allowing the addressing of devices prior to field installation.

5.0 Calibration of Limit Switches

Step 1

Once pneumatic hookup and wiring has been completed close the valve using the SCM-ASI on-board calibration switch, as seen in Figure 4. If no AS-i network connection is available, you may connect a 24VDC power supply to the + ASI - terminals.

Step 2

With a flat blade screwdriver, place blade in slot on lower Target Ring and twist. This disengages the snap lock. Rotate the lower Target Ring clockwise until the Red LED lights. Squeeze the Target Ring until the snap lock is engaged.

Step 3

Open the valve by sliding the calibration switch to the OPEN position.

Step 4

With a flat blade screwdriver, place blade in slot on upper Target Ring and twist. This disengages the snap lock. Rotate the upper Target Ring counter-clockwise until the Green LED lights. Squeeze the Target Ring until the snap lock is engaged.

Step 5

Cycle the valve CLOSED and OPEN a few times using the calibration switch to verify both limit switches are maintaining their set points.

Step 6

Finally, slide the calibration switch to the ASI position. The AS-i network will now have full control of the valve once the SCM-ASI has been addressed.

Zone 2**Telemetry Equipment for use in Hazardous Locations**

AEx/Ex/EEEx nC IIC T4 Tamb = 80°C max

DEMKO 02 ATEX 130957X IP56

Electrical Rating: 30VDC, 160mA

Class I Zone 2, Groups A, B, C, D; Type 4, 4X

Special Conditions of Safe Use (All installations)

Clean only with a damp cloth to prevent possibility of electrostatic discharge.

Warranty

TopWorx warrants that each item of new equipment manufactured by it will be free from defects in material and workmanship under normal use and service; its obligation under this Warranty, being limited to making good, at its factory, and part of parts thereof, which shall be returned to it with transportation charges prepaid, within one year after the date of the purchase of such equipment by the original purchaser, and which its examination shall disclose to its satisfaction to have been thus defective. TopWorx however, assumes no risk or liability for results of the use of the products purchased from it.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER OF MERCHANTABILITY FITNESS, OR OTHERWISE EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES AND TOPWORX NEITHER ASSUMES, NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF THIS EQUIPMENT.

No claims for labor in replacing defective parts and equipment and consequential damages will be allowed by the Company.

This Warranty shall not apply to equipment which has been subjected to misuse, negligence or accident.

This Warranty shall not apply to any equipment which shall have been repaired or altered, outside the Company's factory so as to affect such equipment's stability or reliability in the judgement of the Company.

Customer Feedback Form

For us to better serve you, we need your comments. Please take the time to fill out this questionnaire. We value your feedback!

Contact _____

Company _____

Address _____

City _____ State _____ Zip _____ Country _____

Telephone _____ Fax _____

Email _____

What type of company do you work for? Distributor Valve Automator Systems Integrator End User Other

In what industry are the TopWorx devices being used? Chemical Food & Beverage Pharmaceutical Power

Oil & Gas Pulp & Paper Wastewater Other

Briefly describe the process where the devices are being used? _____

Which TopWorx products are being installed: _____

Date TopWorx products are being installed: _____

Was the product easy to mount? _____

Was the product easy to calibrate and address (if applicable)? _____

Was the product easy to commission (if applicable)? _____

Was the Instruction Manual thorough and easy to read and understand? _____

What improvements, if any, would you make to this product or the Instruction Manual? _____

Please fax your replies to TopWorx at **502.969.5911**. If you prefer, email your comments and suggestions to **info@topworx.com**. For an overview of the additional TopWorx products available, please visit our website at **www.topworx.com**.

We look forward to serving you with Speed & Excellence. Thanks for your feedback!

About Valvetop™

Valvetop valve networking and control devices link on/off valves to process control systems via a variety of fieldbus protocols. Valvetop valve controllers and monitors support multiple bus protocols, operate in the most demanding plant conditions, and carry a variety of global approvals. Whether your application is rotary or linear, fieldbus or conventional, hazardous or general purpose, we have a suitable solution for you.

For inquiries, contact TopWorx at: 502.969.8000
www.topworx.com
info@topworx.com

About TopWorx

TopWorx is the leader in field networking, valve control, and position sensing solutions for the process industries. Our products and services help plants, mills, and pipelines improve their performance by making it easy to implement modern automation technologies.



Field Networking Solutions

Network™ field networking products and services make it easy for plant personnel to understand, implement, and enjoy the benefits of modern bus networking technologies.



Valve Control Solutions

Valvetop™ valve networking and control solutions support multiple bus protocols, operate in the most demanding plant conditions, and carry a variety of global approvals.



Position Sensing Solutions

GO® Switch leverless limit switches provide reliable position sensing in extremely hot, cold, wet, dirty, corrosive, abusive, and explosive plant conditions.

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