ASCO®

Valve Monitoring Systems

Linear & rotary visual indicators

State-of-the-art switch technology

Bus/network compatible

Low power pilot valves

Valve Monitoring Systems

ASCO's Valve Monitoring Systems (VMS) have revolutionized the concept of position indication by combining the technologies of visual indication and network communications.

This catalog contains features, materials of construction, ambient temperatures, electrical information, specifications, ordering information, and dimensional drawings for the VMS line of products. If the information you are looking for is not here please call the contact information provided.

All products are available in corrosion resistant low copper aluminum and resin constructions for hazardous environments. All rotary and linear products provide highly visible 360° indication. Patented Viper™ proximity switch uses internal magnet and switching elements resulting in improved set point accuracy and simplifies maintenance.

INDEX

ASCO®
Valve Monitoring Systems

Direct Mount Position Indicator

for Rotary NAMUR Actuators

SERIES
NR1
NR2

Features

- Set switches on-line without opening the electrical enclosure.
- Eliminates bracketry for all NAMUR type actuators.
- Modular design for ease of field service.
- Enclosures are internally and externally coated for corrosion resistance.
- Realview™ indicator with 100% color change, visible from long distances.
- Environmentally sealed magnets.

Construction

	NR1	NR2
Area Classifications	**Types 4, 4X,7 & 9 Division 1 Class 1, Groups C&D Class II, Groups E,F,& G Groups A & B, Division 2**	**Types 4, 4X,7 & 9 Division 1 Class 1, Groups C&D Class II, Groups E,F,& G Groups A & B, Division 2**
Enclosure of Box	Low Copper Aluminum	
Box Coating	Black Polyester	Lt. Grey Impreglon 309™
Indicator Cover	Polycarbonate	
Screws	Stainless Steel	
Seals	NBR (Buna-N)	
Cam Rings	PBT (Polybutylene)	
Magnet Pack	Ryton™ (Polyphenylene Sulfide)	
Magnets	Nickel Plated Neodymium	

Ambient Temperatures

-20˚F to 150˚F (-30˚C to 66˚C)
-4˚F to 140˚F with bus card (-20˚C to 60˚C)
(Consult factory for -40˚F applications.)

Electrical

Tungsten Switch Pack
Epoxy Filled
Hermetically sealed
Housing: ABS
SPDT Form C
Operating Time: 3.0ms
Initial Contact Resistance: 0.5ohms
Electrical Rating: 3Amps/120VAC
2Amps/24VDC
6 extra terminal points for accessories

Rhodium Switch Pack
Epoxy Filled
Hermetically sealed
Housing: ABS
SPDT Form C
Operating Time: 3.0ms
Initial Contact Resistance: 0.1ohms
Electrical Rating: 1Amp/24VAC

NOTE: ASCO requires 12VDC valves for DeviceNet Bus Cards and 24VDC for AS-interface Bus Cards.

Optional Features

- Low power pilot valve mounted to enclosure
- Attachable Network Junction Box
- AS-interface, Profibus-PA, DeviceNet communication cards
- Up to 3 conduit entries in 3/4" or 20mm
- Alternate indicator color and path options

See list price schedule for available mounting brackets and adapters.

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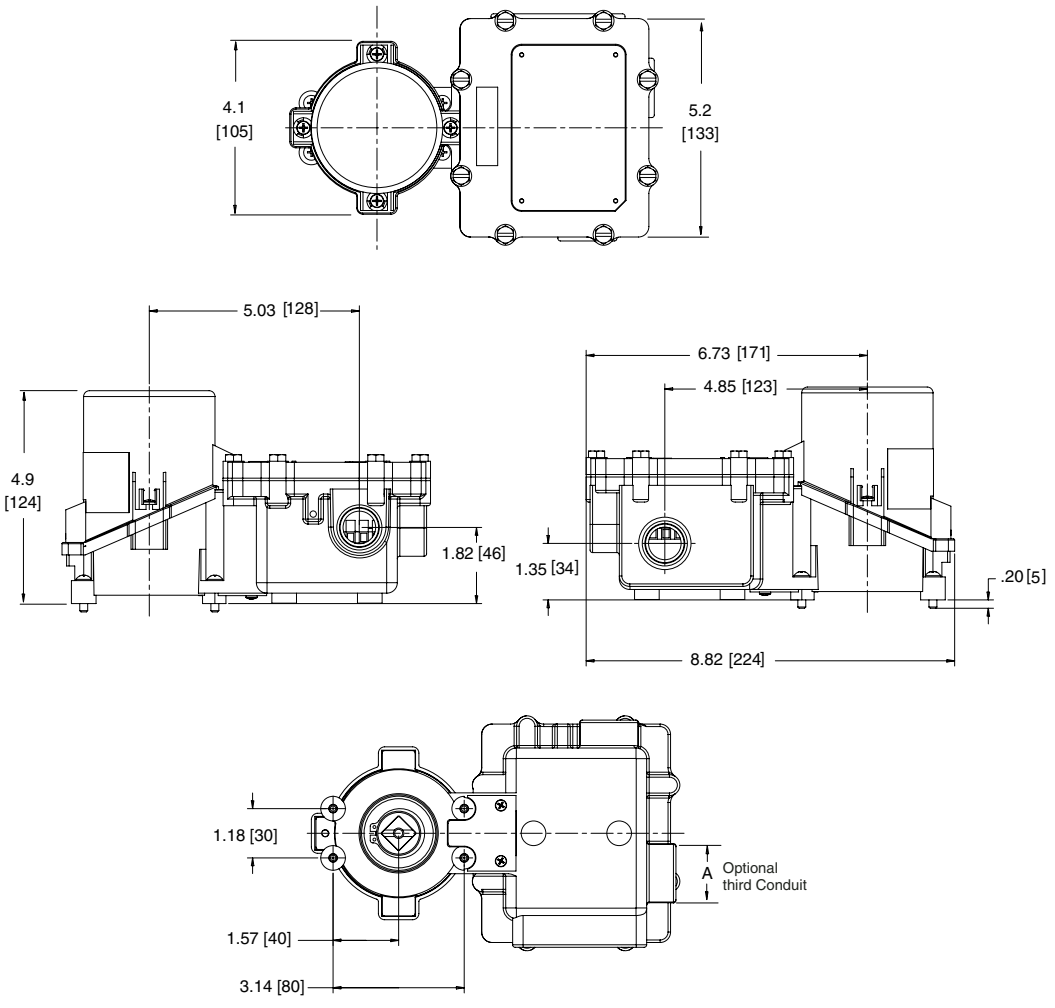
Specifications

Series	Shaft	Conduit ①	Indicator	Change Letter	Switches	# Sw.	Network Communications	Connector
NR1 = Type 7 & 9 Div. 1 NR2 = Div. 2	A = Direct Mount	2 = (2) 3/4" NPT F 4 = (3) 3/4" NPT F 7 = (2) M20x1.5 F 8 = (3) M20x1.5 F	B = Blue/White D = Green/Red G = Green/White R = Red/White T = 3-way U = 3-way Divert W = Red/Green Y = Yellow/Black	A	G = Viper SPDT Rhodium (IS) R = Viper SPDT Rhodium 1A T = Viper SPDT Tungsten 3A W = Network/Bus Comm. Card with internal switches	0 2 4	NG = None AJ = ASI 2x1, v2.1, 31s STD ADDR AL = ASI 2x1, v2.1, 62s EXT ADDR AK = ASI 4x2, v2.1, 31s STD ADDR AM = ASI 4x2, v2.1, 62s EXT ADDR DC = DNET 2x1 DE = DNET 2x1 Diagnostics DD = DNET 6x2 (M1), 2 out, single acting DH = DNET 6x2 (M2), 1 out, double acting DF = DNET 6x2 DIAG (M1), 2 out, single acting DI = DNET 6x2 DIAG (M2), 1 out, double acting PA = Profibus-PA, Non-IS PC = Profibus-PA, IS	A = Threaded Conduit B* = M-12 pin Connector for bus network C* = Mini (7/8") pin connector for bus network * Only available with switch option (W) Network/Bus Card.
NR1	**A**	**2**	**Y**	**A**	**T**	**2**	**NG**	**A**

① Consult ASCO for optional pin connectors.

Ordering Number Example: NR1A2YAT2NGA

Dimensions Inches (mm)



Bracket Mounted Position Indicator

for Rotary Actuators • Aluminum Body

Features

- Reduced enclosure size with lower profile for use in a wide range of applications.
- Division 2 rated with Viper hermetically sealed switches.
- Circular design eliminates pinch points on o-ring seal.
- Internal and external coating for corrosion resistance.
- Realview indicator with 100% change in color visible from long distances.

Construction

	VR3	VR2
Area Classifications	**Type 4, 4x**	**Type 4, 4x Div. 2 - Class I, II Groups A,B,C,D, F & G**
Switch Type	Mechanical Only	Viper / Inductive Proximity Switch Only
Body	Low Copper Aluminum	
Coating	Black Electrolytic Paint	
Indicator Cover	Polycarbonate	
Shaft	316 Stainless Steel	
Bushings	Bronze (oil lite)	
Hardware	Stainless Steel	

Ambient Temperatures

With Mechanical Switches:
-20˚F to 170˚F (T6) (-30˚C to 77˚C)
-20˚F to 180˚F (T5) (-30˚C to 82˚C)
- 4˚F to 140˚F with bus card, potentiometer, or transmitter (-20˚C to 60˚C)

With Viper Switches:
-20˚F to 150˚F (-30˚C to 66˚C)

(Contact ASCO for extended temperature range applications.)

Electrical

VR3 - Mechanical Switches - 15amp silver contacts SPDT, 10A DPDT

VR2 - Viper Switches - Tungsten: 3A/120VAC, 2A/24VDC
Rhodium: 1A/24VDC
Rhodium (IS): 2mA to 1A@24VDC
(suitable for IS applications)
"IS"- Class I,II,III, Div. 1,
Groups A,B,C,D,E,F and G
Class 1, Zone 0, Aex ia IIC T5
Class I, Zone 1, Aex ib IIC T5

Pepperl & Fuchs® "IS" (Intrinsically Safe) Inductive Proximity Switch
Model number NJ2-V3-N
NAMUR (NC) Normally Closed
5-25 VDC <1mA absent target
3-15 mA target present

ATEX category 1G, 2G, 1D
II 1G Eex i a IIC T6
II 1D Ex i a D 20T 108c

12 point terminal strip standard

NOTE: ASCO requires 12VDC valves for DeviceNet Bus Cards and 24VDC for AS-interface Bus Cards.

Optional Features

- Low power pilot valve mounted to enclosure
- AS-interface, Profibus-PA, DeviceNet communication cards
- 2 (standard) or 3 conduit entries in 3/4" or 20mm
- Plug, cable gland, and network connectors
- Potentiometer and transmitter options
- Alternate indicator color and path options

See list price schedule for available mounting brackets and adapters.

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Specifications

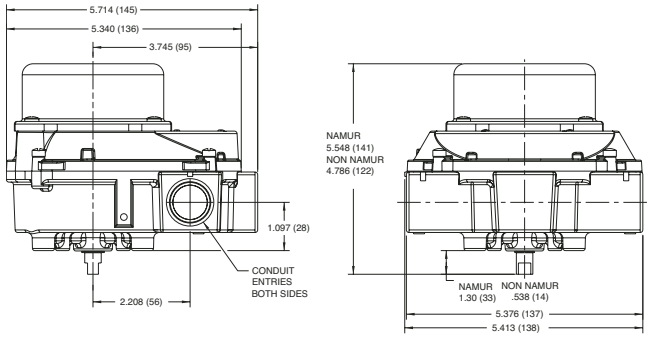
Series	Shaft	Conduit ①	Indicator	Change Letter	Switches	# Sw.	Network Communications	Connector
VR2 = Div. 2 Aluminum VR3 = Type 4,4X Aluminum	B = Non NAMUR 316 S.S. C = NAMUR 316 S.S.	2 = (2) 3/4" NPT F 4 = (3) 3/4" NPT F 7 = (2) M20x1.5 F 8 = (3) M20x1.5 F	B = Blue/White D = Green/Red G = Green/White N = Flat Cover (None) R = Red/White T = 3-Way U = 3-Way Divert W = Red/Green Y = Yellow/Black	A	A = Mech SPDT Silver 15A D = Mech DPDT 10A G = Viper SPDT Rhodium (IS) H = Mech SPDT Gold (IS) N = No Switch P = P&F IS Switch NJ2-V3-NC R = Viper SPDT Rhodium 1A T = Viper SPDT Tungsten 3A	0 1 2 3 4	NG = None RW = RS (0-1000 Ohms) Potentiometer* TY = CS (4-20 MA) Transmitter* * Available with (1) or (2) switches only	A = Threaded Conduit
					W = Network/Bus Comm. Card	0	AJ = ASI 2x1, v2.1, 31s STD ADDR AL = ASI 2x1, v2.1, 62s EXT ADDR AK = ASI 4x2, v2.1, 31s STD ADDR AM = ASI 4x2, v2.1, 62s EXT ADDR DC = DNET 2x1 DE = DNET 2x1 Diagnostics DD = DNET 6x2 (M1), 2 out, single acting DH = DNET 6x2 (M2), 1 out, double acting DF = DNET 6x2 DIAG (M1), 2 out, single acting DI = DNET 6x2 DIAG (M2), 1 out, double acting PA = Profibus-PA, Non-IS PC = Profibus-PA, IS	A = Threaded Conduit B = M-12 pin Connector for bus network C = Mini (7/8") pin connector for bus network
VR2	**B**	**2**	**Y**	**A**	**T**	**2**	**NG**	**A**

① Consult ASCO for optional pin connectors.

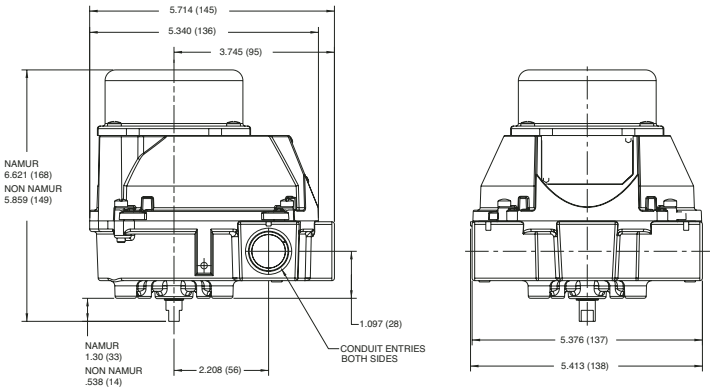
Ordering Number Example: VR2B2YAT2NGA

Dimensions Inches (mm)

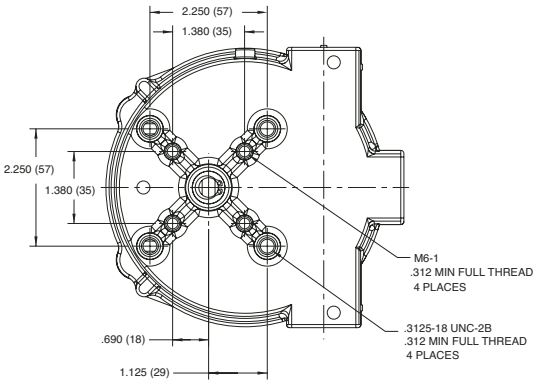
Box with 2 Switches



Box with 3 or 4 Switches, Network Card or Transmitter



Dimensions for Both



Remote Mounted Position Indicator

for Rotary Actuators • Resin Body

Features

- Resin body for corrosion resistance.
- Division 2 rated with Viper hermetically sealed switches.
- Circular design eliminates pinch points on o-ring seal.
- Balanced bolt pattern for uniform sealing.
- Realview indicator with 100% change in color visible from long distances.

Construction

	VR4	VR8
Area Classifications	**Type 4, 4x**	**Type 4, 4x Div. 2 - Class I, II Groups A,B,C,D, F & G**
Switch Type	Mechanical	Viper / Inductive Proximity Switch
Body	Resilient PBT	
Indicator Cover	Polycarbonate	
Shaft	316 Stainless Steel	
Bushings	Nylon	
Hardware	Stainless Steel	

Ambient Temperatures

With Mechanical Switches:
-20˚F to 170˚F (T6) (-30˚C to 77˚C)
-20˚F to 180˚F (T5) (-30˚C to 87˚C)
- 4˚F to 140˚F with bus card, potentiometer or transmitter (-20˚C to 60˚C)

With Viper Switches:
-20˚F to 150˚F (-30˚C to 66˚C)

(Contact ASCO for extended temperature range applications.)

Electrical

Mechanical Switches - 15amp silver contacts SPDT, 10A DPDT

Viper Switches - Tungsten: 3A/120VAC, 2A/24VDC
Rhodium: 1A/24VDC
Rhodium (IS): 2mA to 1A@24VDC
(suitable for IS applications)
"IS"- Class I,II,III, Div. 1,
Groups A,B,C,D,E,F and G

Pepperl & Fuchs "IS" (Intrinsically Safe) Inductive Proximity Switch
Model number NJ2-V3-N
NAMUR (NC) normally closed
5-25 VDC <1mA absent target
3-15 mA target present

ATEX category 1G, 2G, 1D
II 1G Eex i a IIC T6
II 1D Ex i a D 20T 108c

12 point terminal strip standard

NOTE: ASCO requires 12VDC valves for DeviceNet Bus Cards and 24VDC for AS-interface Bus Cards.

Optional Features

- Low power pilot valve mounted to enclosure
- AS-interface, Profibus-PA, DeviceNet communication cards
- 2 (standard) conduit entries in 3/4 or 20mm
- Plug, cable gland, and network connectors
- Potentiometer and transmitter options
- Alternate indicator color and path options

See list price schedule for available mounting brackets and adapters.

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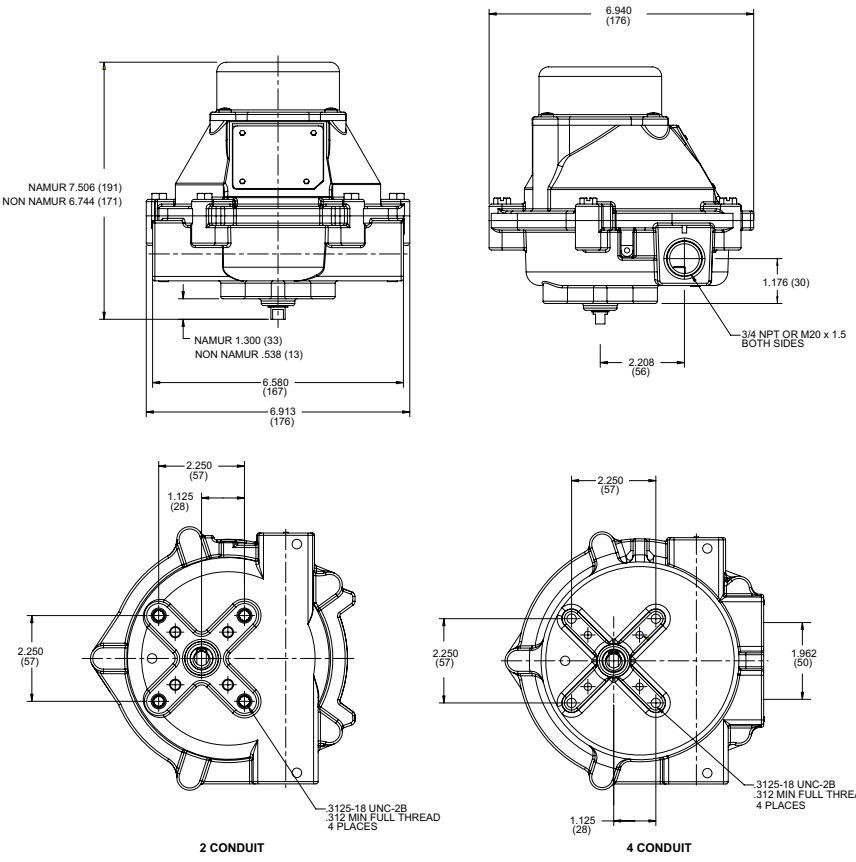
Specifications

Series	Shaft	Conduit ①	Indicator	Change Letter	Switches	# Sw.	Network Communications	Connector
VR4 = Type 4,4X Resin VR8 = Div. 2 Resin	B = Non NAMUR 316 S.S. C = NAMUR 316 S.S.	2 = (2) 3/4" NPT F 7 = (2) M20x1.5 F	B = Blue/White D = Green/Red G = Green/White N = Flat Cover (None) R = Red/White S = 4-Way Path T = 3-Way U = 3-Way Divert W = Red/Green Y = Yellow/Black	A	A = Mech SPDT Silver 15A D = Mech DPDT 10A G = Viper SPDT Rhodium (IS) H = Mech SPDT Gold (IS) N = No Switch P = P&F IS Switch NJ2-V3-NC R = Viper SPDT Rhodium 1A T = Viper SPDT Tungsten 3A	0 1 2 3 4	NG = None RW = RS (0-1000 Ohms) Potentiometer* TY = CS (4-20 MA) Transmitter* * Available with (1) or (2) switches only	A = Threaded Conduit
					W = Network/Bus Comm. Card with Integral Switches	0	AJ = ASI 2x1, v2.1, 31s STD ADDR AL = ASI 2x1, v2.1, 62s EXT ADDR AK = ASI 4x2, v2.1, 31s STD ADDR AM = ASI 4x2, v2.1, 62s EXT ADDR DC = DNET 2x1 DE = DNET 2x1 Diagnostics DD = DNET 6x2 (M1), 2 out, single acting DH = DNET 6x2 (M2), 1 out, double acting DF = DNET 6x2 DIAG (M1), 2 out, single acting DI = DNET 6x2 DIAG (M2), 1 out, double acting PA = Profibus-PA, Non-IS PC = Profibus-PA, IS	A = Threaded Conduit B = M-12 pin Connector for bus network C = Mini (7/8") pin connector for bus network
VR8	**B**	**2**	**Y**	**A**	**T**	**2**	**NG**	**A**

① Consult ASCO for optional pin connectors.

Ordering Number Example: VR8B2YAT2NGA

Dimensions Inches (mm)



Remote Mounted Position Indicator

for Rotary Actuators • Aluminum Body

Features

- Heavy duty industrial design approved for Division 1 Group B areas.
- Circular design eliminates pinch points on o-ring seal.
- Balanced bolt pattern for uniform sealing.
- Realview indicator with 100% change in color visible from long distances.

Construction

VR7	
Area Classifications	**Type 4, 4x, 7 and 9 Div I, Class I,II,III, Groups B,C,D,E, F & G Div. 2, Class I, Groups A,B,C & D Class I, Zone I, AEx d IIB T6**
Body	Low Copper Aluminum
Body Coating	Black Electrolytic Paint
Indicator Cover	Polycarbonate
Shaft	316 Stainless Steel
Bushings	Bronze (oil lite)
Hardware	Stainless Steel

Ambient Temperatures

With Mechanical Switches:
-20˚F to 170˚F (T6) (-30˚C to 77˚C)
-20˚F to 180˚F (T5) (-30˚C to 87˚C)
- 4˚F to 140˚F with bus card, potentiometer, or transmitter (-20˚C to 60˚C)

With Viper Switches:
-20˚F to 150˚F (-30˚C to 66˚C)

(Contact ASCO for extended temperature range applications.)

Electrical

Mechanical Switches - 15amp silver contacts SPDT, 10A DPDT

Viper Switches - Tungsten: 3A/120VAC, 2A/24VDC
Rhodium: 1A/24VDC
Rhodium (IS): 2mA to 1A@24VDC
(suitable for IS applications)
"IS"- Class I,II,III, Div. 1,
Groups A,B,C,D,E,F and G

Pepperl & Fuchs "IS" (Intrinsically Safe) Inductive Proximity Switch
Model number NJ2-V3-N
NAMUR (NC) Normally Closed
5-25 VDC <1mA absent target
3-15 mA target present

ATEX category 1G, 2G, 1D
II 1G Eex i a IIC T6
II 1D Ex i a D 20T 108c

12 point terminal strip standard

NOTE: ASCO requires 12VDC valves for DeviceNet Bus Cards and 24VDC for AS-interface Bus Cards.

Optional Features

- Low power pilot valve mounted to enclosure
- Network Junction Box for hazardous areas
- AS-interface, Profibus-PA, DeviceNet communication cards
- 2 (standard), 3, or 4 conduit entries in 3/4" or 20mm
- Plug, cable gland, and network connectors
- Potentiometer and transmitter options
- Alternate indicator color and path options

See list price schedule for available mounting brackets and adapters.

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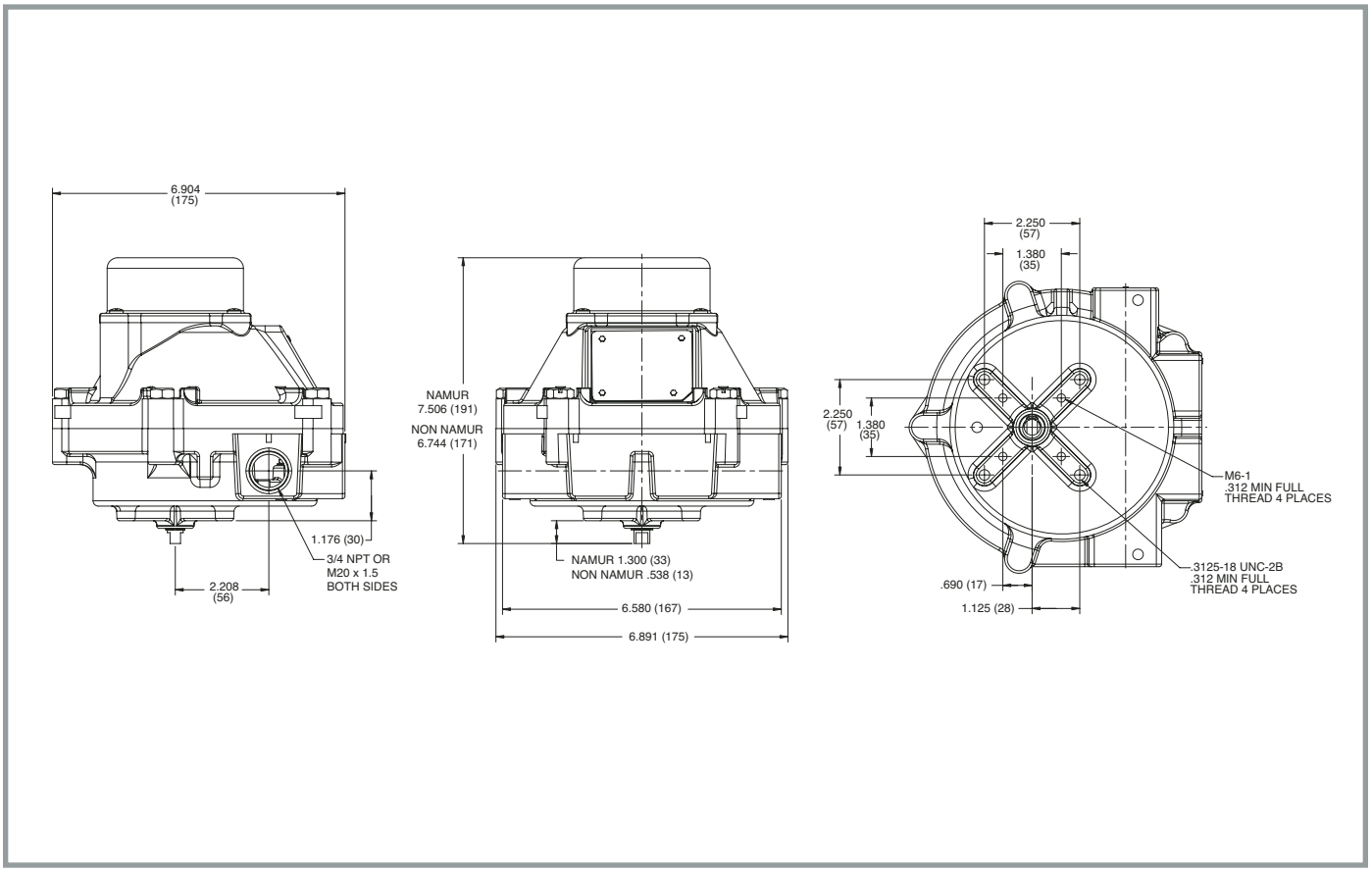
Specifications

Series	Shaft	Conduit ①	Indicator	Change Letter	Switches	# Sw.	Network Communications	Connector
VR7 = Type 7 & 9 Aluminum	B = Non NAMUR 316 S.S. C = NAMUR 316 S.S.	2 = (2) 3/4" NPT F 4 = (3) 3/4" NPT F 6 = (4) 3/4" NPT F 7 = (2) M20x1.5 F 8 = (3) M20x1.5 F 9 = (4) M20x1.5 F	B = Blue/White D = Green/Red G = Green/White N = Flat Cover (None) R = Red/White S = 4-way Path T = 3-way U = 3-way Divert W = Red/Green Y = Yellow/Black	A	A = Mech SPDT Silver 15A D = Mech DPDT 10A G = Viper SPDT Rhodium (IS) H = Mech SPDT Gold (IS) N = No Switch P = P&F IS Switch NJ2-V3-NC R = Viper SPDT Rhodium 1A T = Viper SPDT Tungsten 3A	0 1 2 3 4	NG = None RW = RS (0-1000 Ohms) Potentiometer TY = CS (4-20 MA) Transmitter * Available with (1) or (2) switches only	A = Threaded Conduit
					W = Network/Bus Comm. Card	0	AJ = ASI 2x1, v2.1, 31s STD ADDR AL = ASI 2x1, v2.1, 62s EXT ADDR AK = ASI 4x2, v2.1, 31s STD ADDR AM = ASI 4x2, v2.1, 62s EXT ADDR DC = DNET 2x1 DE = DNET 2x1 Diagnostics DD = DNET 6x2 (M1), 2 out, single acting DH = DNET 6x2 (M2), 1 out, double acting DF = DNET 6x2 DIAG (M1), 2 out, single acting DI = DNET 6x2 DIAG (M2), 1 out, double acting PA = Profibus-PA, Non-IS PC = Profibus-PA, IS	A = Threaded Conduit B = M-12 pin Connector for bus network C = Mini (7/8") pin connector for bus network
VR7	**B**	**2**	**Y**	**A**	**A**	**2**	**NG**	**A**

① Consult ASCO for optional pin connectors.

Ordering Number Example: VR7B2YAA2NGA

Dimensions Inches (mm)



Features

- Explosion proof, Div. 1 rated aluminum housing for hazardous locations.
- Simple to install and adjust.
- Understroke compensating switch triggers.
- 12 mounting positions (in 30˚ increments).
- No seal fittings required with Viper switches in Class I, Div. 1, Group A,B,C,D areas.
- One construction accommodates strokes up to 2 inches.

Construction

Area	Type 4, 4X
Body	Low Copper Aluminum
Coating	Black Hard Anodized
Switch Triggers	ABS
Inner Frame	Zytel™ Nylon

Ambient Temperatures

With Mechanical Switches:
-20˚F to 170˚F (T6) (-30˚C to 77˚C)
- 4˚F to 140˚F with bus card (-20˚C to 60˚C)

With Viper Switches:
-20˚F to 150˚F (-30˚C to 66˚C)

Electrical

Mechanical Switches - 15amp silver contacts SPDT
- 100mA @ 30VDC gold plated contacts SPDT (IS)

Viper Switches - Tungsten: 3A/120VAC, 2A/24VDC
Rhodium: 1A/24VDC
Rhodium (IS): 2mA to 1A@24VDC

NOTE: ASCO requires 12VDC valves for DeviceNet Bus Cards and 24VDC for AS-interface Bus Cards.

Approvals

FM approved for “Hazardous (Classified) locations”; Class 3600, 3610, 3611, & 3615.

CSA Certified to Standard C22.2 No. 142-M “Process Control Equipment”; Hazardous Locations, Class 2258-02, 04, 82 & 84.

Zytel is a registered trademark of DuPont Co.

Optional Features

- Low power pilot valve mounted to enclosure
- Network Junction Box for hazardous locations
- AS-interface, Profibus-PA, DeviceNet communication cards with 2 sensors to indicate stem position
- 2 or 3 conduit entries in 3/4”FNPT

See list price schedule for available mounting brackets and adapters.

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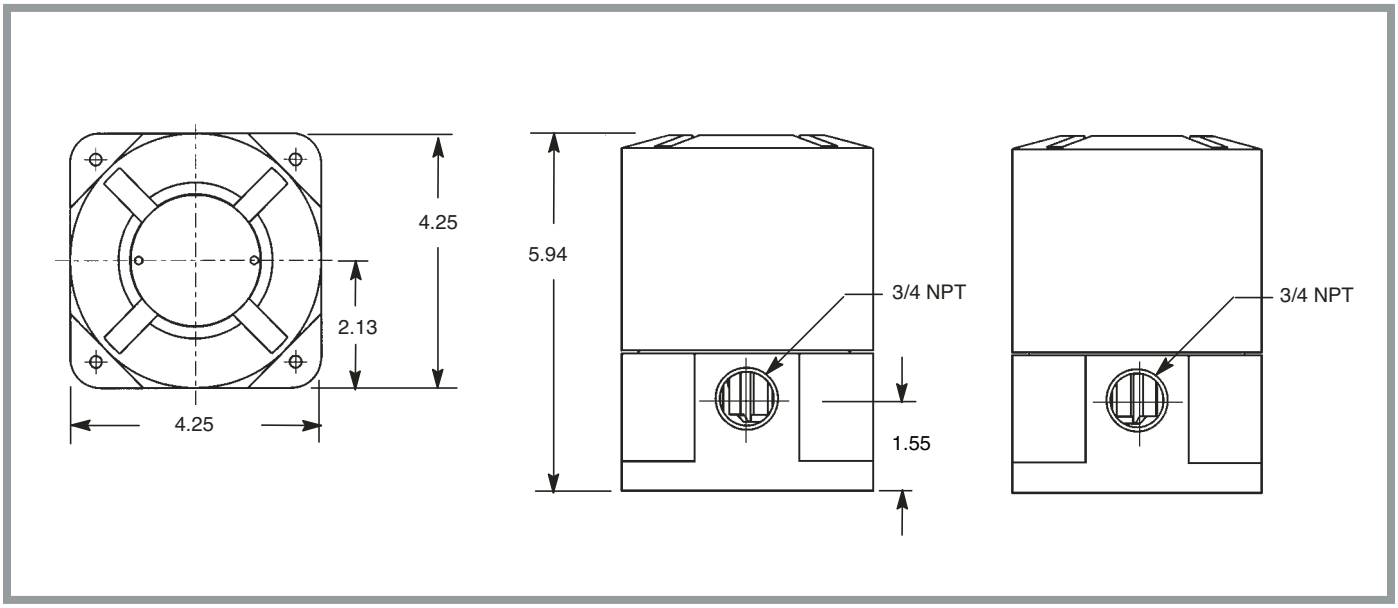
Specifications

Series	Hazardous Classified Location	Shaft	Conduit	Indicator	Change Letter	Switches	# Sw.	Network/Bus	Rev.
HS1 Series Type 4,4X Indoor/Outdoor	Explosionproof: **with Switches** Class1/Div.1/A,B,C,D/T6 Dust Ignition Proof: Class2,3/Div.1/E,F,G/T6 Ambient Temp. = 77˚C/170˚F	F = ITT(<1") G = Saunders(<1") H = ITT(1-1/4" to 2") K = ITT Series 47 (3" & 4") L = Gemu D6 (1/2" to 1") M = Gemu D6 (1-1/4" to 1-1/2") Q = ITT Series 33 (3" & 4")	2 = (2) 3/4 FNPT 4 = (3) 3/4 FNPT	N = None	A	A = Mech SPDT Silver 15A H = Mech SPDT Gold (IS) N = No Switch	0 = None U = One Upper L = One Lower 2 = Two	NG = None	A
	Explosionproof: **with Switches** Class1/Div.1/A,B,C,D/T6 Dust Ignition Proof: Class2,3/Div.1/E,F,G/T6 Ambient Temp. = 60˚C/140˚F					G = Viper SPDT Rhodium (IS) R = Viper SPDT Rhodium 1A T = Viper SPDT Tungsten 3A			
	Explosionproof: **with Bus Card** Class1/Div.1/A,B,C,D/T6 Dust Ignition Proof: Class2,3/Div.1/E,F,G/T6 Ambient Temp. = 60˚C/140˚F					W = Network/Bus Card	0 = None	AJ = ASI 2x1, v2.1, Std. Address AL = ASI 2x1, v2.1, Ext. Address DC = DNET2x1 DE = DNET 2x1 Diagnostics PA = Profibus-PA, Non IS	
HS1		**F**	**2**	**N**	**A**	**A**	**2**	**NG**	**A**

Dimensions Inches



Features

- Process valve body is serviceable without removing indicator box.
- Built-in understroke compensation.
- Simple to install and adjust.
- Designed for caustic washdown.
- One construction accommodates valve strokes up to 2 inches.
- 12 mounting positions (in 30˚ increments).
- Indicator visible from 360˚.

Construction

	HS 2	HS 3	HS 4
Area Classifications	**Type 4, 4X Indoor Hazardous Location***	**IP66 Indoor/Outdoor Hazardous Location***	**Type 4, 4X IP66 Indoor/Outdoor Non-Hazardous Location**
Switch Type	Viper ① or Mechanical		
Body	Valox 364 (Resilient PBT)		
Indicator Cover	Polycarbonate (Makrolon Grade 2607™) UV Stabilized		
Switch Trigger	ABS		
Inner Frame	Zytel Nylon		

① Mechanical SPDT gold plated switch is also available for intrinsically safe (IS) applications. * *See Specifications Chart.*

Ambient Temperatures:

With Mechanical Switches:
-20˚F to 170˚F (T6) (-30˚C to 77˚C)
-20˚F to 180˚F (T5) (-30˚C to 82˚C)
- 4˚F to 140˚F with bus card (-20˚C to 60˚C)

With Viper Switches:
-20˚F to 150˚F (-30˚C to 66˚C)

Electrical

Mechanical Switches - 15A/125,250VAC silver contacts SPDT (HS4)
- 100mA @ 30VDC gold plated contacts SPDT (IS) (HS2 & 3)

Viper Switches (HS2 & 3) - Tungsten: 3A/120VAC, 2A/24VDC
- Rhodium: 1A/24VDC
- Rhodium (IS): 2mA to 1A@24VDC

NOTE: ASCO requires 12VDC valves for DeviceNet Bus Cards and 24VDC for AS-interface Bus Cards.

Makarolon 2607 is a registered trademark of Bayer Inc.

Optional Features

- Attached low power pilot valve or with integrated valve.
- AS-interface, Profibus-PA, DeviceNet communication cards with 2 switches to indicate stem position.
- Up to 3 conduit entries 1/2", 3/4", or 20mm.
- Plug, cable gland, and network connectors.

See list price schedule for available mounting brackets and adapters.

Approvals

FM approved for:
"Hazardous (Classified) locations"; Class 3600, 3610 & 3611(HS 2 & 3). Unclassified Locations (HS 4).

CSA Certified to Standard C22.2 No. 142-M "Process Control Equipment"; Hazardous Locations, Class 2258-02, 04, 82 & 84 (HS 2 & 3), and General Requirements, Class 2252-01(HS 4), File 013976-0-000.

CE Certified.

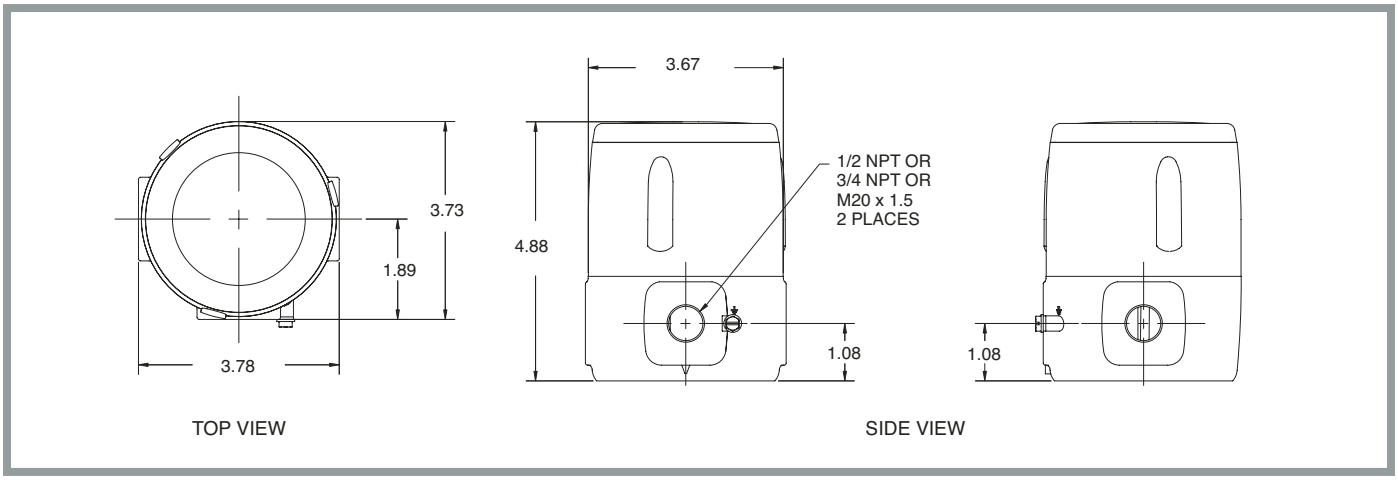
Specifications

Series	Hazardous Classified Location	Shaft	Conduit / Connector ①	Indicator	Change Letter	Switches	# Sw.	Network/Bus	Rev.
HS2 Series Type 4,4X Indoor	Intrinsically Safe: Class1,2,3/Div.1/A,B,C,D/T6 Class1/Zone 0/AEx ia IIC/T6 Class1/Zone 1/AEx ib IIC/T6 Ambient Temp. = 77˚C/170˚F Class2/Div.1/A,B,C,D,E,F,G	D=ITT/GEMU E=Saunders N=8290	A=(1) 1/2 FNPT B=(1) 3/4 FNPT C=(1) M20 x 1.5 M=M12, 4 pin N=M12, 5 pin R=7/8", 4 pin S=7/8", 5 pin 1=(2) 1/2 FNPT 2=(2) 3/4 FNPT 3=(3) 1/2 FNPT 4=(3) 3/4 FNPT 7=(2) M20 x 1.5 8=(3) M20 x 1.5	Y=Yel/Black	A	H=Mech SPDT Gold (IS) G=Viper SPDT Rhodium (IS)	0=None U=One Open Upper L=One Closed Lower 2=Two	NG=None	A
	Non-Incendive: with Viper™ Switches Class1/Div.2/A,B,C,D/T6 Class2/Div.2/F,G/T6 Except Dust Ambient Temp. = 77˚C/170˚F Special Protection: Indoor Only					T=Viper SPDT Tungsten 3A R=Viper SPDT Rhodium 1A			
	Non-Incendive: with Bus Card Class1/Div.2/A,B,C,D/T6 Class2/Div.2/F,G/T6 Ambient Temp. = 60˚C/140˚F Special Protection: Indoor Only					W=Network/Bus Card	0=None	AJ=ASI 2x1, v2.1, Std Address AL=ASI 2x1, v2.1, Ext Address DC=DNET2x1 DE=DNET 2x1 Diagnostics PA = Profibus-PA, Non IS	
HS3 Series IP-66 Indoor/Outdoor	Intrinsically Safe: Class1,2,3/Div.1/A,B,C,D,E,F,G/T6 Class1/Zone 0/AEx ia IIC/T6 Class1/Zone 1/AEx ib IIC/T6 Ambient Temp. = 77˚C/170˚F Class2/Div.1/A,B,C,D,E,F,G					H=Mech SPDT Gold (IS) G=Viper SPDT Rhodium (IS)	U=One Open Upper L=One Closed Lower 2=Two	NG=None	
						T=Viper SPDT Tungsten 3A R=Viper SPDT Rhodium 1A			
						W=Network/ Bus Card (Hall effect switches included)	0=None	AJ=ASI 2x1, v2.1, Std Address AL=ASI 2x1, v2.1, Ext Address DC=DNET2x1 DE=DNET 2x1 Diagnostics PA = Profibus-PA, Non IS	
HS4 Series Type 4,4X Indoor IP-66 Indoor/Outdoor	Non-hazardous					N=None A=Mech SPDT Silver 15A H=Mech SPDT Gold (IS)	U=One Upper (open) L=One Lower (closed) 2=Two	NG=None	
HS4		**D**	**1**	**Y**	**A**	**A**	**2**	**NG**	**A**

① Consult ASCO for optional connectors.

Ordering Example without valve: HS4D1YAA2NGA

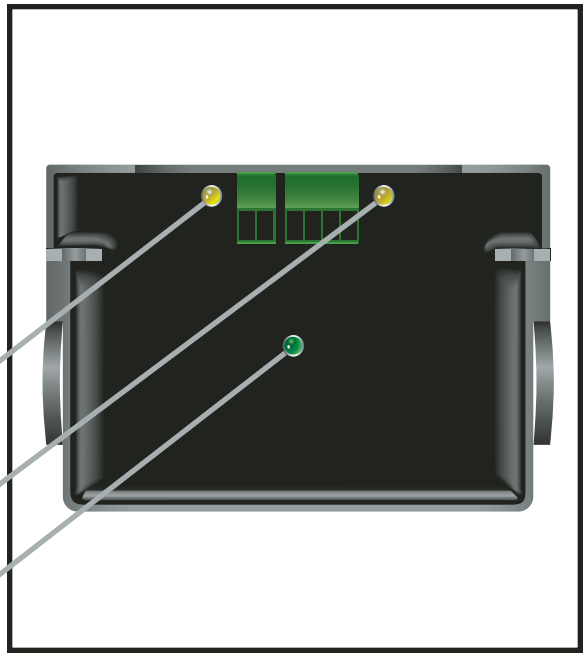
Dimensions: Inches



DeviceNet™ Network Card

Features

- Advance technology allows solenoid output to operate throughout DeviceNet voltage.
- Onboard diagnostics provides easy calibration.
- ODVA conformance tested to Composite 15
- Fully encapsulated electronics module
- Bus powered inputs and outputs
- Two built-in sensors for OPEN/CLOSE detection
- Short/Open Circuit protection



Visual Diagnostics

OPEN POSITION

CLOSED POSITION

LED FOR BUS LINE STATUS

- No LED lit: No power
- Flashing Green: Online but no established DeviceNet connections.
- Solid Green: Online with established DeviceNet connections.
- Flashing Red: Timed out DeviceNet I/O connection(s)
- Solid Red: Communication fault: Duplicate address or incorrect baud rate

ASCO Valve Monitoring System is an integrated network module and limit switch package that connects automated valves and external devices directly to the control system reducing the I/O interfaces and wiring associated with a typical hardwired solution. The DeviceNet Network Card is fully encapsulated for superior environmental protection, and LEDs provide visual status of network connection and valve position. Optional diagnostics provide built-in maintenance tools such as cycle count, travel times, self-calibration, and valve information. Our network cards operate with our NR and VR series rotary or HS series linear indicators. Enclosures types range from Nema 4, 4X to Class 1, Division 1, Groups B, C & D. Accessories such as a Network Junction Box are available.

Note: ASCO recommends using12 VDC pilot valves with DeviceNet cards.

DeviceNet™ Technical Specifications

Maximum Distance	500 Meters/1640 Feet
Physical Media	Four wire system (two for communication and two for power)
Available I/O	2 inputs, 1 output
	6 inputs, 2 output (includes 4 general purpose input)
Network Topology	Trunk line/dropline with branching
Supported Baud Rate	125 Kbps, 250 Kbps, 500 Kbps
Diagnostics	Yes
Bus Voltage	11-25 VDC

Ordering Number Example: VR7C2YAW0__A

DC = DNet 2x1
DE = DNet 2x1 with diagnostics
DD = DNet 6x2 (m1), 2 outputs, single acting
DH = DNet 6x2 (m2), 1 output, double acting
DF = DNet 6x2 with diagnostics (m1), 2 outputs, single acting
DI = DNet 6x2 with diagnostics (m2), 1 output, double acting

Diagnostics

Valve Monitoring Systems

Standard Diagnostics

Input Status – state of input whether valve is CLOSED or OPEN

Solenoid Voltage – indicates the voltage applied to solenoid

Output Status – indicates whether the solenoid output is in open or short circuit condition

Bus Voltage – indicates the DeviceNet voltage at that node

Valve Tag # - 16 character text for user input of node id

Valve Manufacturer – 16 character text for user input of valve manufacturer of particular node

Actuator Manufacturer – 16 character text for user input of actuator manufacturer of particular node

Valve Serial # – 16 character text for user input of valve serial # of particular node

Actuator Serial # – 16 character text for user input of actuator serial # of particular node

Valve ID # – 16 character text for user input of valve ID (part number or type) of particular node

Actuator ID# – 16 character text for user input of actuator ID (part number or type) of particular node

Extended Diagnostics

Cycle Count Pilot Valve – actual number of cycle, OPEN-to-CLOSE and CLOSE-to-OPEN for the pilot valve

Cycle Count Limit Pilot Valve – operational cycle limit of the pilot valve. Once limit is exceeded a fault will be sent to PLC/DCS indicating limit exceeded

Cycle Count Actuator – actual number of cycle, OPEN-to-CLOSE and CLOSE-to-OPEN for the actuator

Cycle Count Limit Actuator - operational cycle limit of the actuator. Once limit is exceeded a fault will be sent to PLC/DCS indicating limit exceeded

Cycle Count Main Valve (Process Valve) – actual number of cycle, OPEN-to-CLOSE and CLOSE-to-OPEN for the pilot valve

Cycle Count Limit Main Valve (Process Valve) – operational cycle limit of the main valve. Once limit is exceeded a fault will be sent to PLC/DCS indicating limit exceeded

Note: the Travel & Break Time below are accurate to 10mS

Travel Time OPEN-to-CLOSE – the last time between the change-in-state command-CLOSE and the indication the valve is in the CLOSE position. This is the recorded value of the last time the valve was used.

Setpoint Travel Time OPEN-to-CLOSE – calibration value of the time between the change-in-state command-CLOSE and the indication the valve is in the CLOSE position. This value is automatically recorded & saved during Calibration command.

Tolerance Travel Time OPEN-to-CLOSE – maximum allowable difference between Travel Time OPEN-to-CLOSE & Setpoint Travel Time OPEN-to-CLOSE. If Travel Time exceeds Setpoint + Tolerance, then a fault will be sent to PLC/DCS indicating limit exceeded.

Travel Time CLOSE-to-OPEN – the last time between the change-in-state command-OPEN and the indication the valve is in the OPEN position. This is the recorded value of the last time the valve was used.

Setpoint Travel Time CLOSE-to-OPEN – calibration value of the time between the change-in-state command-OPEN and the indication the valve is in the OPEN position. This value is automatically recorded & saved during Calibration command.

Tolerance Travel Time CLOSE-to-OPEN – maximum allowable difference between Travel Time CLOSE-to-OPEN & Setpoint Travel Time CLOSE-to-OPEN. If Travel Time exceeds Setpoint + Tolerance, then a fault will be sent to PLC/DCS indicating limit exceeded.

Break Time OPEN-to-CLOSE – the last time between the change-in-state command-CLOSE and the indication the valve leaves the OPEN state. This is the recorded value of the last time the valve was used.

Setpoint Break Time OPEN-to-CLOSE – calibration value of the time between the change-in-state command-CLOSE and the indication the valve leaves the OPEN state. This value is automatically recorded & saved during Calibration command.

Tolerance Break Time OPEN-to-CLOSE – maximum allowable difference between Break Time OPEN-to-CLOSE & Setpoint Break Time OPEN-to-CLOSE. If the Break Time exceeds Setpoint + Tolerance, then a fault will be sent to PLC/DCS indicating limit exceeded.

Break Time CLOSE-to-OPEN – the last time between the change-in-state command-OPEN and the indication the valve leaves the CLOSE state. This is the recorded value of the last time the valve was used.

Setpoint Break Time CLOSE-to-OPEN – calibration value of the time between the change-in-state command-OPEN and the indication the valve leaves the CLOSE state. This value is automatically recorded & saved during Calibration command.

Tolerance Break Time CLOSE-to-OPEN – maximum allowable difference between Break Time CLOSE-to-OPEN & Setpoint Break Time CLOSE-to-OPEN. If the Break Time exceeds Setpoint + Tolerance, then a fault will be sent to PLC/DCS indicating limit exceeded.

Configurable Behavior – in the event that the PLC/DCS stops communicating the device as the ability to automatically switch to a “Fail Safe” position.

Input Identifier – for versions with 4 extra inputs the device has 4 general purpose identifiers (16 characters max for each) for user input of devices connected to those inputs.

Profibus-PA Network Card

ASCO®
Valve Monitoring Systems

Features

- Low current consumption for Intrinsically Safe bus applications.
- 2 wire bus system with maintenance and diagnostics.
- Fully encapsulated electronics module with 2 built-in Hall Effect sensors for OPEN/CLOSED detection.
- Can be used with single or double acting actuators.
- Galvanic isolation of outputs.
- Addressable by DIP switches or bus line.
- Self-calibration feature.

Technical Specifications

Maximum Distance	1900 Meters (6200 ft) 9500 meters (31,100 ft.) with repeaters
Physical Media	1 twisted pair #18 AWG (0.8 mm^2)
Available I/O	2x2 (2 inputs, 2 outputs)
Network Topology	Bus, line, star, and combinations
Supported Baud Rate	31.25 Kbps
Number of addressable devices	up to 126

Ambient Temperatures

32˚F to +140˚F (0˚C to +60˚C)

Electrical

Connection is made using shielded two-wire Profibus PA cable

Outputs - discrete output - 6.6VDC@1.6mA each
(One output used at a time)

Power consumption of 11.0mA

Approvals

Profibus-PA conformance (V3.0 Discrete Output)

CE marked

ATEX (II 1 G EEx ia IIC T4)

Optional Features

- ASCO Piezo valves
- SHORT CIRCUIT detection to determine condition of Piezo operator

How to Specify

Description	Code
2X2 NON "IS"	PA
2X2 "IS"	PC

Ordering Example: VR7B2YAW0**PA**A

Valve Information

Valve Man – 16 character text for user input of pilot valve manufacturer

Actuator Man – 16 character text for user input of actuator manufacturer

Valve Ser Num – 16 character text for user input of pilot valve serial #

Actuator Ser Num – 16 character text for user input of actuator serial #

Valve ID – 16 character text for user input of pilot valve ID (part number or type)

Actuator ID – 16 character text for user input of actuator ID (part number or type)

Configuration

Device can be configured by user for actuation of the following type:

Single Output – For Single Acting Actuator (Spring return) where only one 3-way pilot valve is needed. Pilot valve is energized to OPEN and de-energized to CLOSE the actuator.

Two Outputs – For Double Acting Actuator where two 3-way pilot valves are needed. One valve to OPEN and another valve to CLOSE the actuator. If a 4-way pilot valve is used then only 1 is required and configuration should be for single output.

Discrete Output Diagnostics

TRAVEL COUNT – actual number of cycle, OPEN-to-CLOSE or CLOSE-to-OPEN for the actuator. Two travel count equals 1 cycle.

TRAVEL COUNT LIMIT – operational cycle limit of the actuator. Once limit is exceeded a fault will be sent to PLC/DCS indicating limit exceeded.

Note: The Travel & Break Time below are accurate to 10mS

TRAVEL TIME OPEN-CLOSE ACT – the last time between the change-in-state command-CLOSE and the indication the valve is in the CLOSE position. This is the recorded value of the last time the valve was used.

TRAVEL TIME OPEN-CLOSE – calibration (setpoint) value of the time between the change-in-state command-CLOSE and the indication the valve is in the CLOSE position. This value is automatically recorded & saved during Calibration command.

TRAVEL TIME OPEN-CLOSE TOL – maximum allowable difference between Travel Time OPEN-to-CLOSE & Setpoint Travel Time OPEN-to-CLOSE.

TRAVEL TIME CLOSE-OPEN ACT – the last time between the change-in-state command-OPEN and the indication the valve is in the OPEN position. This is the recorded value of the last time the valve was used.

TRAVEL TIME CLOSE-OPEN – calibration (setpoint) value of the time between the change-in-state command-OPEN and the indication the valve is in the OPEN position. This value is automatically recorded & saved during Calibration command.

TRAVEL TIME CLOSE-OPEN TOL – maximum allowable difference between Travel Time CLOSE-to-OPEN & Setpoint Travel Time CLOSE-to-OPEN.

BREAK TIME OPEN-CLOSE ACT – the last recorded time between the change-in-state command-CLOSE and the indication the valve leaves the OPEN state.

BREAK TIME OPEN-CLOSE – calibration (setpoint) value of the time between the change-in-state command-CLOSE and the indication the valve leaves the OPEN state. This value is automatically recorded & saved during Calibration command.

BREAK TIME OPEN-CLOSE TOL – maximum allowable difference between Break Time OPEN-to-CLOSE & Setpoint Break Time OPEN-to-CLOSE.

BREAK TIME CLOSE-OPEN ACT – the last recorded time between the change-in-state command-OPEN and the indication the valve leaves the CLOSE state.

BREAK TIME CLOSE-OPEN – calibration (setpoint) value of the time between the change-in-state command-OPEN and the indication the valve leaves the CLOSE state. This value is automatically recorded & saved during Calibration command.

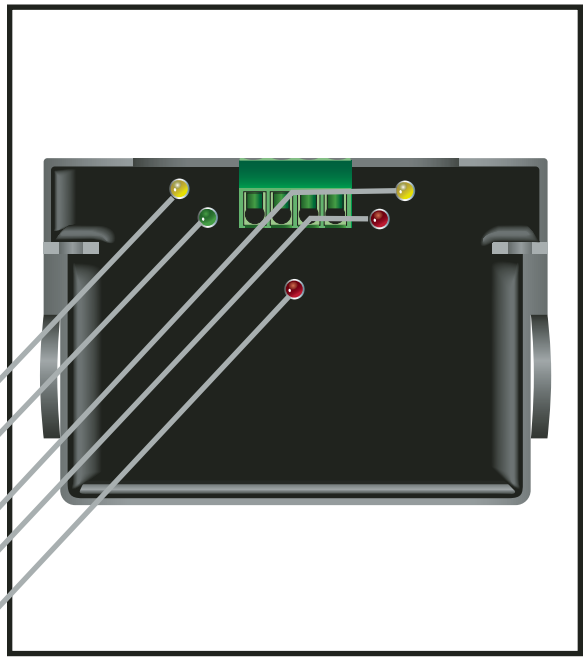
BREAK TIME CLOSE-OPEN TOL – maximum allowable difference between Break Time CLOSE-to-OPEN & Setpoint Break Time CLOSE-to-OPEN.

FAIL SAFE MODE – in the event that the PLC/DCS stops communicating, the device has the ability to automatically switch to a Fail Safe Mode. Fail Safe Mode is selectable to “Hold last good value” or go to “Fail Safe Position”. Fail Safe position is user defined to be either OPEN or CLOSE. In addition, a delay time can be set to allow the device to wait until switching to Fail Safe Mode.

AS-Interface Network Card

Features

- AS-interface certified
- Fully encapsulated electronic module
- Bus powered inputs & outputs
- Two built-in sensors for OPEN/CLOSE detection
- Short circuit protection for inputs and outputs
- LEDs for visual indication:
  - OPEN/CLOSE
  - Solenoid output
  - Bus communication
  - Faults



Visual Diagnostics

OPEN POSITION: Yellow LED

BUS STATUS: Green LED

CLOSED POSITION: Yellow LED

SOLENOID: Red LED

BUS FAULT: Red LED

ASCO Valve Monitoring System is designed for monitoring and controlling the position of valve actuators via AS-interface V2.1. The AS-interface Network Card is fully encapsulated for superior environmental protection and features plug-in terminal blocks for easy maintenance, built-in sensors for OPEN/CLOSE detection, and LEDs to provide visual status of network connection and actuator position. Our network cards operate with our NR and VR series rotary or HS series linear indicators. Enclosure types range from NEMA 4, 4X to Class 1, Division 1, Groups B, C & D. Accessories such as a Network Junction Box are available.

Note: ASCO recommends using 24 VDC pilot valves with AS-interface cards.

AS-Interface Technical Specifications

Maximum Distance	100m (330 ft)
Physical Media	Two-wire cable
Maximum Nodes	62
Available I/O	2 inputs, 1 output
	4 inputs, 2 output (includes 2 general purpose input)
Network Topology	Bus, Tree, Star
Baud Rate	167 Kbps

Ordering Number Example: VR7C2YAW0__A

AJ = ASI 2x1, Version 2.1, standard addressing, 31 slaves
AL = ASI 2x1, Version 2.1, extended addressing, 62 slaves
AK = ASI 4x2, Version 2.1, standard addressing, 31 slaves
AM = ASI 4x2, Version 2.1, extended addressing, 62 slaves

Network Junction Box

for AS-interface and DeviceNet Networks

ASCO®
Valve Monitoring Systems

Features

- For Division 1 bus applications using AS-interface or DeviceNet protocols.
- Switchable to allow for servicing of the node without interruption to the bus communications.
- In the off position it can be "locked out" or "tagged out".
- Explosion proof conduit union for ease of installation and service of system.
- No adapters needed to mount to ASCO VMS products.
- Three 3/4" NPT conduit entries. (One to the indicator box and two for bus connections.)
- Seal fittings only needed in Div 1, Group B atmospheres.

Construction

Part	Material
Body	Copper free Aluminum
Coating	Black Epoxy Powder Coated

Ambient Temperatures

-40˚F to 140˚F (-40˚C to 60˚C)

Ratings and Approvals

FM and CSA approved
Type 4X
Class I, Division 1, Groups B, C, & D
Class II, III, Division 1 Groups E, F, & G
Class I, Division 2, Groups A, B, C & D
Class II, Division 2, Groups F & G
T6 temperature code at -40˚F to 140˚F ambients

Note: See list price schedule for available Junction Box kits.

Potentiometer or Transmitter

VR Series Option

Features

Potentiometer

- 0 to 1000 ohm resistive outputs to control system, proportional to the process valve position.

Transmitter

- 4-20mA signal outputs to control system, proportional to the process valve position.
- Easy calibration of transmitter with on-board LED and calibration button.
- Calibration settings stored in non-volatile memory.
- Gear drive mechanism located above switches for easy access and adjustments (for 0-10Kohms potentiometer).
- All transmitters are rated for use in intrinsically safe or non-incendive areas.
- Fully encapsulated transmitter circuit board for environmental protection.
- Clockwise or counter-clockwise operation with reversible signal outputs.

Electrical

Potentiometer Specifications	
Shaft Rotation Range	0-95˚
Resistance	0-1000 ohms
Full Scale Tolerance	± 100 ohms
Linearity	± 2.0%
Rotation	300˚
Terminals	12 pts for pot/switches/accessories

Transmitter Specifications	
Shaft Rotation Range	0-95˚ (45˚ minimum)
Input Voltage Range	8-38 VDC
Potentiometer Resistance	0-10,000 ohms
Output Signal Range	4-20mA DC
Load Impedance Range	0-800 ohms at 24 VDC
Output Impedance	25 M ohms (typical)
Offset Error at 4mA	± 20 µA (max)
Offset Drift	± 500 µA /˚C (max)
Span Error at 20mA	± 40 µA (max)
Span Drift	± 1000 µA /˚C (max)
Linearity	± 2.0%
Hysteresis	1.0% of full scale
Repeatability	± 0.3% of full scale
Input Voltage Effects	2 µA/V (typical)
Calibration	Auto-setting via pushbutton
Indication	Red LED (variable brightness with position)
Terminals	2pts for 4-20mA + 8pts for switches/accessories

How to Specify

Potentiometer option - RW
(0-1000ohms resistive output)

Transmitter option - TY
(4-20mA signal output)

Ordering Example
VR8B2YAT2RWA
VR8B2YAG2TYA
VR8B2YANOTYA (without switches)

Mechanical Switch and Netwark Card available together.

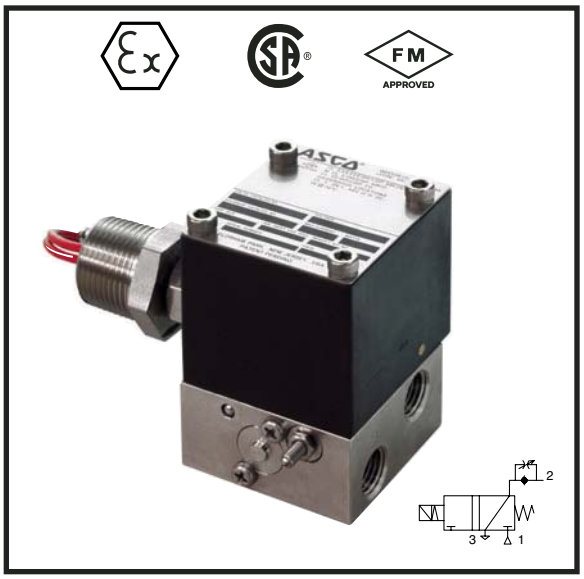
3-Way Normally Closed Pilot Valves

for assembly to VMS boxes

ASCO®
Valve Monitoring Systems

Features

- Explosion proof, Type 4 & 4X and Intrinsically Safe solenoids.
- Poppet design provides durability and reliability in a wide range of ambient temperatures.
- Nickel plated brass, 303 or 316 stainless steel bodies designed for harsh process conditions.
- Built-in speed controls and rebreather connection.
- High efficiency, low wattage coils (2 watt AC and .5 watt DC).
- 1/4" NPT inline connection.
- Cv factors of 0.3 or 0.7.
- Easy positioning with adjustable stainless steel conduit coupler.



Construction

Part	Material
Body	Nickel Plated Brass, 303 or 316 Stainless Steel
Solenoid Enclosure	Ryton™ (Polyphenylene Sulfide)
Seals and Disc	Buna "N"

Electrical

		DC		
	120/60 AC	**12V ①**	**24V ①**	**IS 24VDC**
Nominal Watt Rating	2.0w	.5w	.5w	.5w
Operating Current	25.3mA	30mA	15mA	29mA

See next page for IS Entity Parameters.

① 12V compatible with DeviceNet, 24V compatible with AS-i

Ambient Temperatures

-20˚C to 70˚C (-4˚F to 158˚F)

Solenoid Enclosures

Enclosure Option Code

EE Div. 1 with 3/4" MNPT connector
B0 Type 4 & 4x with 20mm x 1.5 connector
AS Intrinsically Safe with 3/4" MNPT connector
BS Intrinsically Safe with 20mm x 1.5 connector

Voltage Codes

AG - 120/60 AJ - 230/60
D2 - 24/DC D1 - 12/DC

Ratings and Approvals

B0 - Type 4 & 4X - (Indoor and outdoor locations)
EE - Class I, Div. 1, Groups A,B,C, & D
Class II, Div. 1, Groups E,F & G
Non-incendive Class I, Div. 2, Groups A,B,C, & D
Class II, Div. 2, Groups F & G
Hazardous locations Class I, Zone I
AEx d m IIC T6 @ 70˚C
AS, BS - Intrinsically Safe Class I, II, III, Div. 1, Groups A-G, Class I, Zone 0, AEx ia IIC T6 @ 70˚C
ATEX EEx i a IIC

Optional Features

Specify suffix codes for manual operators

MI - Momentary (push in & hold)
MS - Sustained (push in & turn)

Entity Parameters for Intrinsically Safe options AS & BS

Groups A-G	V max	I max	P max	Capacitance	Inductance
Parameters	30 VDC	100 mA	0.75 w	0 nf	2.2 mH

Specifications

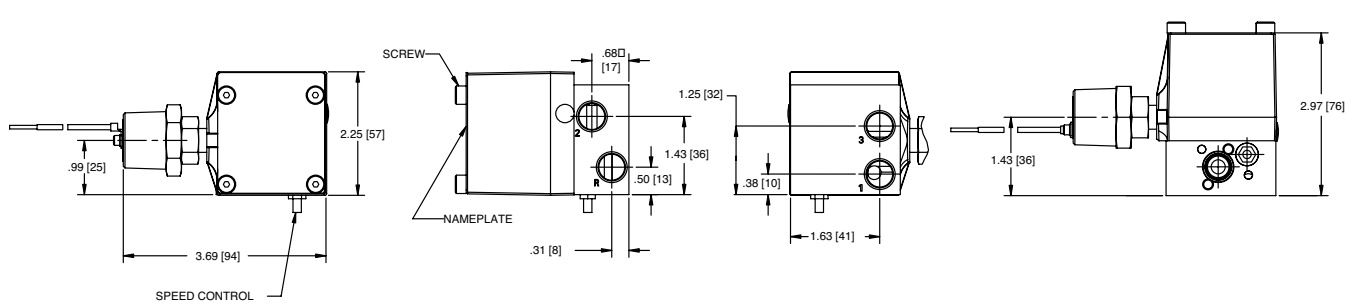
Pipe size (ins.)	Orifice Dia. (ins.)	Cv Flow	Operating Pressure Differential (psi) Min.	Max. AC/DC Air-Inert Gas	Media	Max. Fluid Temp.˚F	Nickel Plated Brass	303 Stainless Steel	316 Stainless Steel	Const. Ref.
1/4	1/8	0.3	35	125	AIR	180	8355A001	8355A011	8355A081	1
1/4	1/4	0.7	35	125	AIR	180	8355A002	8355A012	8355A082	2

Ordering Example: 8355A081

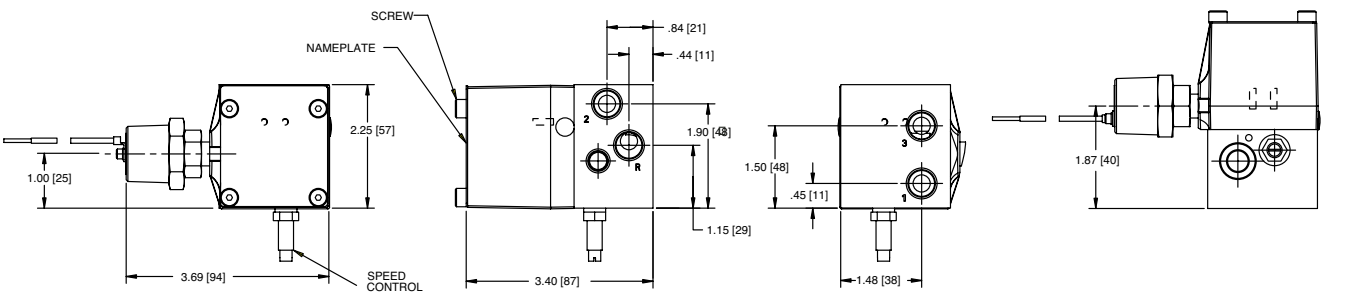
Enclosure	Voltage	Options
EE	AG	MI

Dimensions Inches (mm)

Const. Ref. 1



Const. Ref. 2



3-Way Normally Closed Pilot Valves

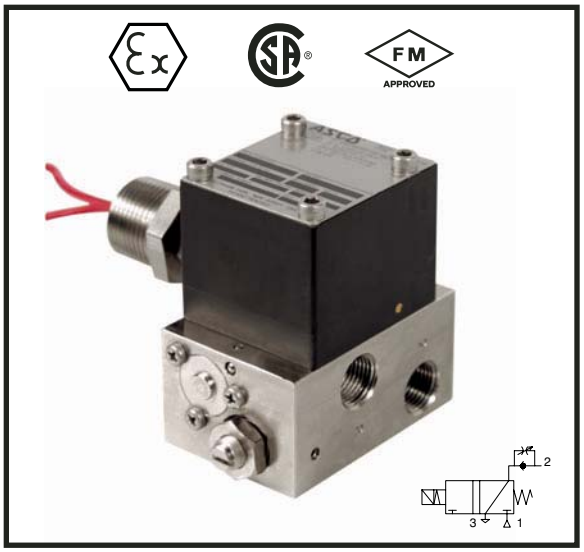
for assembly to VMS boxes

3/8" NPT • High Flow 2.0Cv Versions

ASCO®
Valve Monitoring Systems

Features

- Explosion proof, Type 4 & 4X and Intrinsically Safe solenoids.
- Poppet design provides durability and reliability in a wide range of ambient temperatures.
- Nickel plated brass, 303 or 316 stainless steel bodies designed for harsh process conditions.
- Built-in speed controls and rebreather connection.
- High efficiency, low wattage coils (2 watt AC and .5 watt DC).
- 3/8" NPT inline connection.
- Cv factor of 2.0.
- Easy positioning with adjustable stainless steel conduit coupler.



Construction

Part	Material
Body	Nickel plated brass, 303 or 316 Stainless Steel
Solenoid Enclosure	Ryton (Polyphenylene Sulfide)
Seals and Disc	Buna "N"

Electrical

		DC		
	120/60 AC	12V	24V	IS 24VDC
Nominal Watt Rating	2.0w	.5w	.5w	.5w
Operating Current	25.3mA	30mA	15mA	29mA

See next page for IS Entity Parameters.

Ambient Temperatures

-20˚C to 70˚C (-4˚F to 158˚F)

Solenoid Enclosures

Enclosure Option Code

EE Div. 1 with 3/4" MNPT connector
B0 Type 4 & 4x with 20mm x 1.5 connector
AS Intrinsically Safe with 3/4" MNPT connector
BS Intrinsically Safe with 20mm x 1.5 connector

Voltage Codes

AG - 120/60 AJ - 230/60
D2 - 24/DC D1 - 12/DC

Ratings and Approvals

B0 - Type 4 & 4X - (Indoor and outdoor locations)
EE - Class I, Div. 1, Groups A,B,C, & D
Class II, Div. 1, Groups E,F & G
Non-incendive Class I, Div. 2, Groups A,B,C, & D
Class II, Div. 2, Groups F & G
Hazardous locations Class I, Zone I
AEx d m IIC T6 @ 70˚C
AS, BS - Intrinsically Safe Class I, II, III, Div. 1, Groups A-G, Class I, Zone 0, AEx ia IIC T6 @ 70˚C
ATEX EEx i a IIC

Optional Features

Specify suffix codes for manual operators

MI - Momentary (push in & hold)
MS - Sustained (push in & turn)

Entity Parameters for Intrinsically Safe options AS & BS

Groups A-G	V max	I max	P max	Capacitance	Inductance
Parameters	30 VDC	100 mA	0.75 w	0 nF	2.2 mH

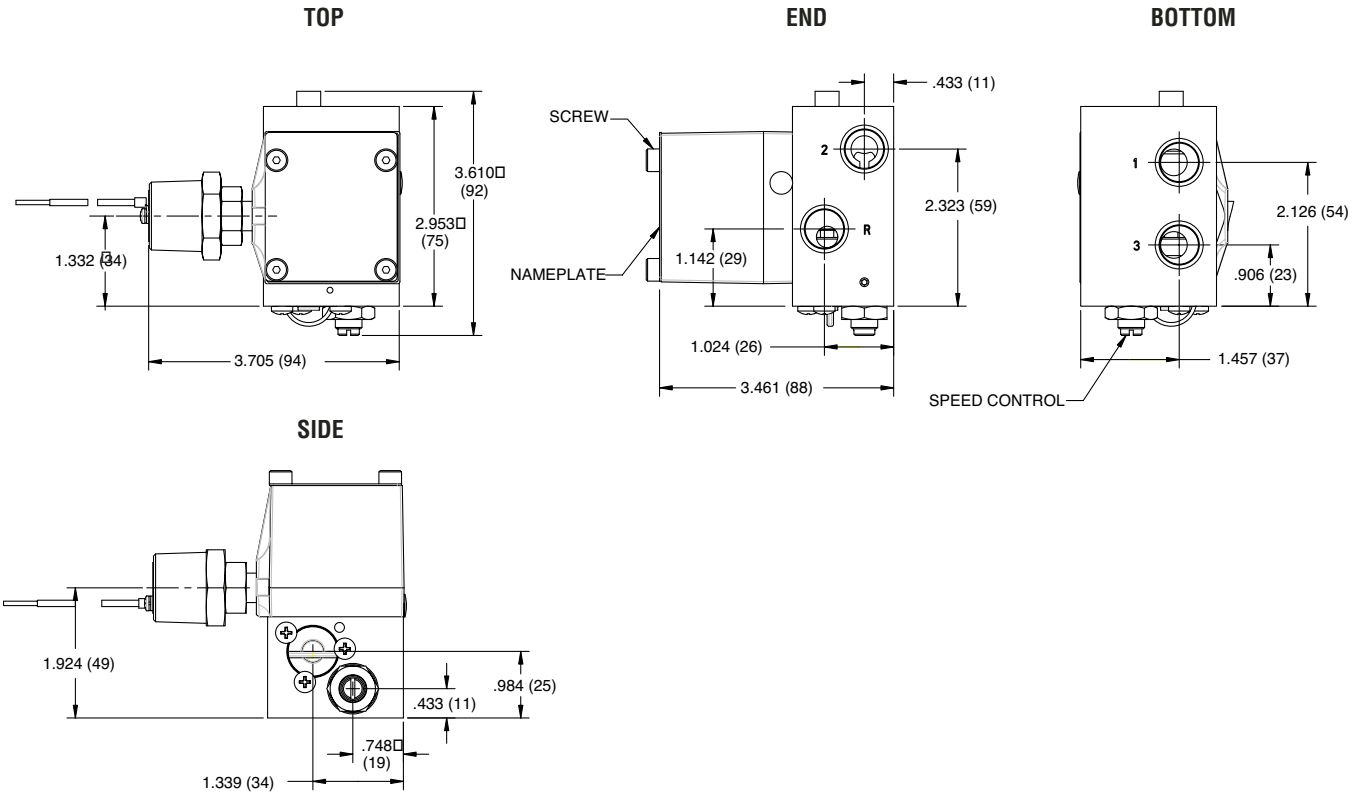
Specifications

Pipe size (ins.)	Orifice Dia. (ins.)	Cv Flow	Operating Pressure Differential (psi) Min.	Operating Pressure Differential (psi) Max. AC/DC Air-Inert Gas	Media	Max. Fluid Temp.˚F	Nickel Plated Brass	303 Stainless Steel	316 Stainless Steel	Const. Ref.
3/8	3/8	2.0	35	125	AIR	180	8355A003	8355A013	8355A083	3

Ordering Example: 8355A083 | Enclosure: EE | Voltage: AG | Options: MI

Dimensions Inches (mm)

Const. Ref. 3



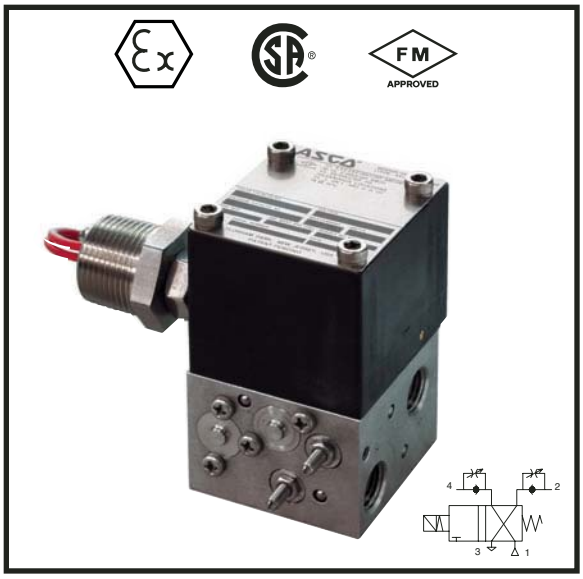
4-Way Pilot Valves

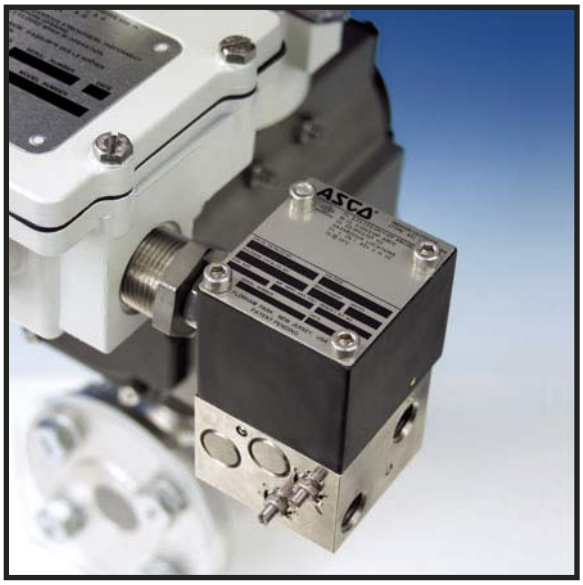
for assembly to VMS boxes

ASCO®
Valve Monitoring Systems

Features

- Explosion proof, Type 4 & 4X and Intrinsically Safe solenoids.
- Poppet design provides durability and reliability in a wide range of ambient temperatures.
- Nickel plated brass, 303 or 316 stainless steel bodies designed for harsh process conditions.
- Built-in speed controls.
- High efficiency, low wattage coils (2 watt AC and .5 watt DC).
- 1/4" NPT inline connection.
- Cv factors of 0.3 or 0.7.
- Easy positioning with adjustable stainless steel conduit coupler.





Construction

Part	Material
Body	Nickel plated brass, 303 or 316 Stainless Steel
Solenoid Enclosure	Ryton (Polyphenylene Sulfide)
Seals and Disc	Buna "N"

Electrical

		DC		
	120/60 AC	**12V ①**	**24V ①**	**IS 24VDC**
Nominal Watt Rating	2.0w	.5w	.5w	.5w
Operating Current	25.3mA	30mA	15mA	29mA

See next page for IS Entity Parameters.

① 12V compatible with DeviceNet, 24V compatible with AS-i

Ambient Temperatures

-20˚C to 70˚C (-4˚F to 158˚F)

Solenoid Enclosures

Enclosure Option Code

EE Div. 1 with 3/4" MNPT connector
B0 Type 4 & 4x with 20mm x 1.5 connector
AS Intrinsically Safe with 3/4" MNPT connector
BS Intrinsically Safe with 20mm x 1.5 connector

Voltage Codes

AG - 120/60 AJ - 230/60
D2 - 24/DC D1 - 12/DC

Ratings and Approvals

B0 - Type 4 & 4X - (Indoor and outdoor locations)
EE - Class I, Div. 1, Groups A,B,C, & D
Class II, Div. 1, Groups E,F & G
Non-incendive Class I, Div. 2, Groups A,B,C, & D
Class II, Div. 2, Groups F & G
Hazardous locations Class I, Zone I
AEx d m IIC T6 @ 70˚C
AS, BS - Intrinsically Safe Class I, II, III, Div. 1, Groups A-G, Class I, Zone 0, AEx ia IIC T6 @ 70˚C
ATEX EEx i a IIC

Optional Features

Specify suffix codes for manual operators

MI - Momentary (push in & hold)
MS - Sustained (push in & turn)

Entity Parameters for Intrinsically Safe options AS & BS

Groups A-G	V max	I max	P max	Capacitance	Inductance
Parameters	30 VDC	100 mA	0.75 w	0 nF	2.2 mH

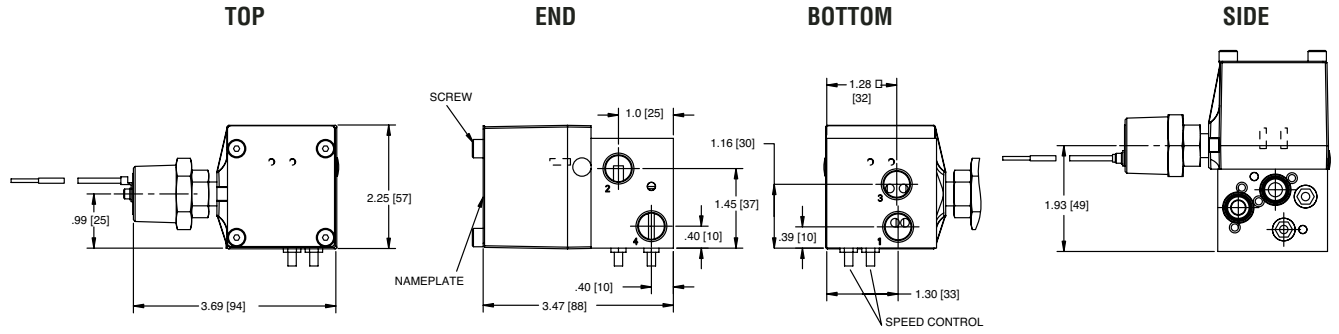
Specifications

Pipe size (ins.)	Orifice Dia. (ins.)	Cv Flow	Operating Pressure Differential (psi) Min.	Operating Pressure Differential (psi) Max. AC/DC Air-Inert Gas	Media	Max. Fluid Temp. ˚F	Nickel Plated Brass	303 Stainless Steel	316 Stainless Steel	Const. Ref.
1/4	1/8	0.3	35	125	AIR	180	8455A001	8455A011	8455A081	1
1/4	1/4	0.7	35	125	AIR	180	8455A002	8455A012	8455A082	2

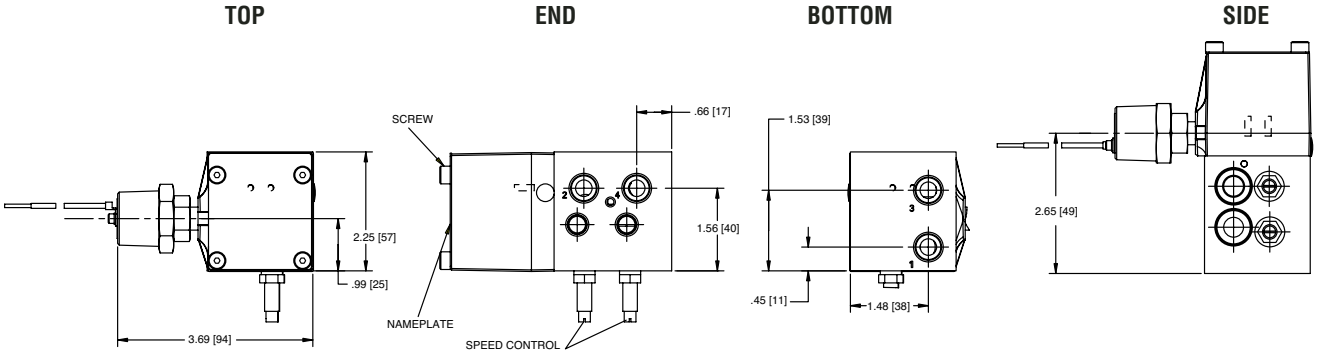
Ordering Example: 8455A082 — Enclosure: EE — Voltage: D2 — Options: MI

Dimensions Inches (mm)

Const. Ref. 1



Const. Ref. 2



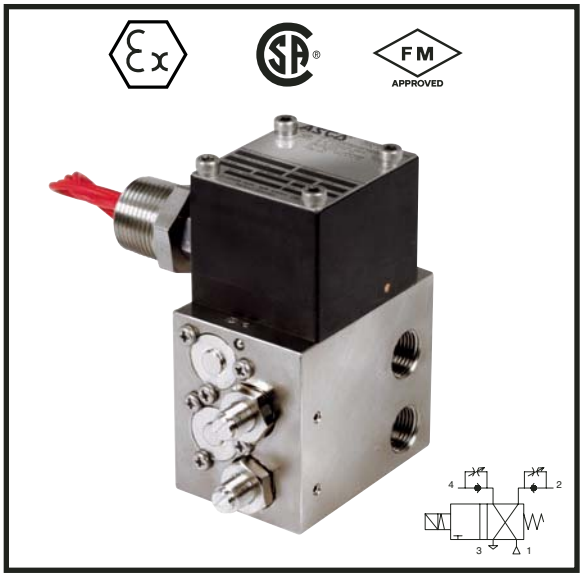
4-Way Pilot Valves

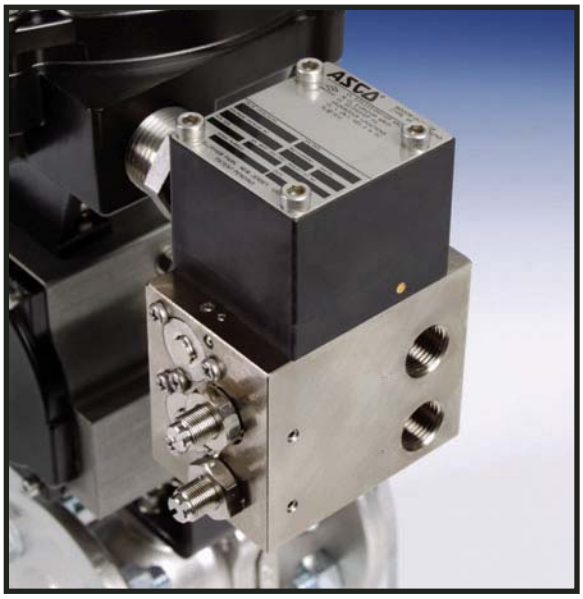
for assembly to VMS boxes
3/8" NPT • High Flow 2.0Cv Versions

ASCO®
Valve Monitoring Systems

Features

- Explosion proof, Type 4 & 4X and Intrinsically Safe solenoids.
- Poppet design provides durability and reliability in a wide range of ambient temperatures.
- Nickel plated Brass, 303 or 316 stainless steel bodies designed for harsh process conditions.
- Built-in speed controls.
- High efficiency, low wattage coils (2 watt AC and .5 watt DC).
- 3/8" NPT inline connection.
- Cv factor of 2.0.
- Easy positioning with adjustable stainless steel conduit coupler.





Construction

Part	Material
Body	Nickel plated brass, 303 or 316 Stainless Steel
Solenoid Enclosure	Ryton™ (Polyphenylene Sulfide)
Seals and Disc	Buna "N"

Electrical

		DC		
	120/60 AC	12V	24V	IS 24VDC
Nominal Watt Rating	2.0w	.5w	.5w	.5w
Operating Current	25.3mA	30mA	15mA	29mA

See next page for IS Entity Parameters.

Ambient Temperatures

-20˚C to 70˚C (-4˚F to 158˚F)

Solenoid Enclosures

Enclosure Option Code

EE Div. 1 with 3/4" MNPT connector
B0 Type 4 & 4x with 20mm x 1.5 connector
AS Intrinsically Safe with 3/4" MNPT connector
BS Intrinsically Safe with 20mm x 1.5 connector

Voltage Codes

AG - 120/60 AJ - 230/60
D2 - 24/DC D1 - 12/DC

Ratings and Approvals

B0 - Type 4 & 4X - (Indoor and outdoor locations)
EE - Class I, Div. 1, Groups A,B,C, & D
Class II, Div. 1, Groups E,F & G
Non-incendive Class I, Div. 2, Groups A,B,C, & D
Class II, Div. 2, Groups F & G
Hazardous locations Class I, Zone I
AEx d m IIC T6 @ 70˚C
AS, BS - Intrinsically Safe Class I, II, III, Div. 1, Groups A-G, Class I, Zone 0, AEx ia IIC T6 @ 70˚C
ATEX EEx i a IIC

Optional Features

Specify suffix codes for manual operators

MI - Momentary (push in & hold)
MS - Sustained (push in & turn)

Entity Parameters for Intrinsically Safe options AS & BS

Groups A-G	V max	I max	P max	Capacitance	Inductance
Parameters	30 VDC	100 mA	0.75 w	0 nF	2.2 mH

Specifications

Pipe size (ins.)	Orifice Dia. (ins.)	Cv Flow	Operating Pressure Differential (psi)		Media	Max. Fluid Temp.˚F	Nickel Plated Brass	303 Stainless Steel	316 Stainless Steel	Const. Ref.
			Min.	Max. AC/DC Air-Inert Gas						
3/8	3/8	2.0	35	125	AIR	180	8455A003	8455A013	8455A083	3

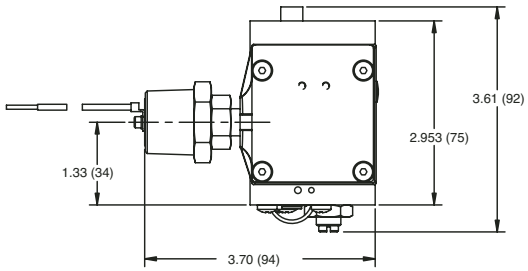
Ordering Example: 8455A083

Enclosure	Voltage	Options
EE	D2	MI

Dimensions Inches (mm)

Const. Ref. 3

TOP



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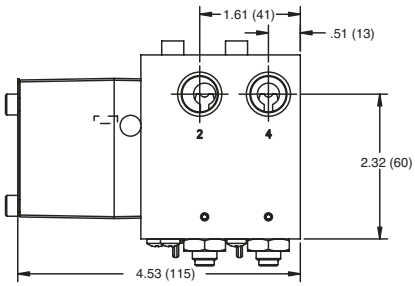

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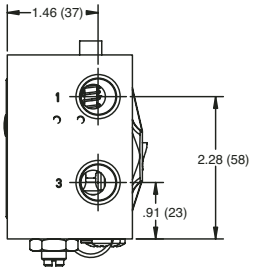
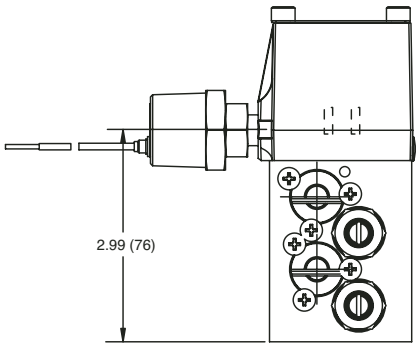


SIDE



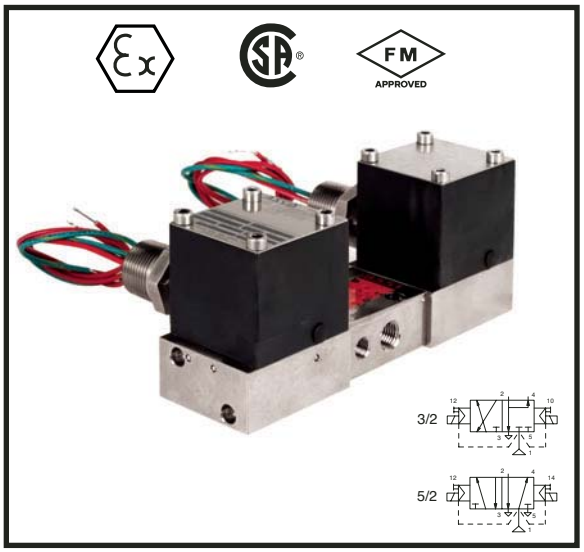
3 or 4-Way Bi-Stable Pilot Valve

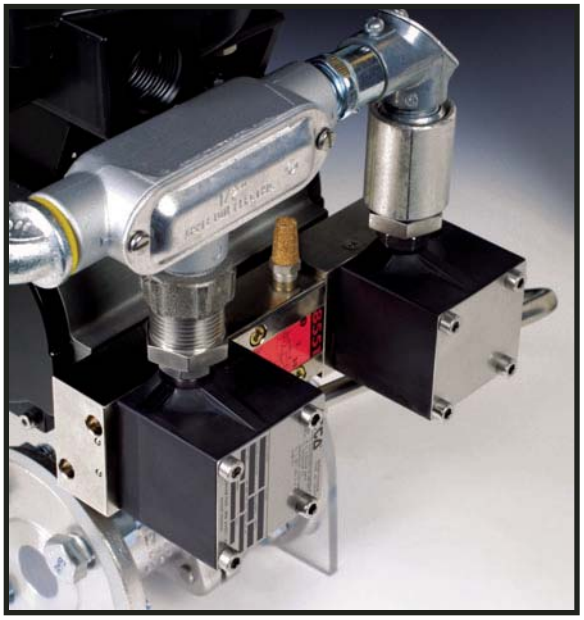
for direct mounting to NAMUR actuator

ASCO®
Valve Monitoring Systems

Features

- Explosion proof, Type 4, & 4X and Intrinsically Safe solenoids.
- 3/2 or 5/2 operation with change of the flow plate.
- Nickel plated brass body designed for harsh process conditions.
- Direct mount to NAMUR actuator.
- For use with VMS boxes having 3 or 4 conduit entries.
- High efficiency, low wattage coils (2 watt AC and .5 watt DC).
- Cv factor of 0.7.
- Easy installation with adjustable stainless steel conduit couplers.





Construction

Part	Material
Body	Nickel Plated Brassel
Solenoid Enclosure	Ryton (Polyphenylene Sulfide)
Seals and Disc	Buna "N"

Electrical

		DC		
	120/60 AC	**12V**	**24V**	**IS 24VDC**
Nominal Watt Rating	2.0w	.5w	.5w	.5w
Operating Current	25.3mA	30mA	15mA	29mA

See next page for IS Entity Parameters.

Ambient Temperatures

-20˚C to 70˚C (40˚F to 158˚F)

Solenoid Enclosures

Enclosure Option Code

EE Div. 1 with 3/4" MNPT connector
B0 Type 4 & 4x with 20mm x 1.5 connector
AS Intrinsically Safe with 3/4" MNPT connector
BS Intrinsically Safe with 20mm x 1.5 connector

Voltage Codes

AG - 120/60 AJ - 230/60
D2 - 24/DC D1 - 12/DC

Ratings and Approvals

B0 - Type 4 & 4X - (Indoor and outdoor locations)
EE - Class I, Div. 1, Groups A,B,C, & D
Class II, Div. 1, Groups E,F & G
Non-incendive Class I, Div. 2, Groups A,B,C, & D
Class II, Div. 2, Groups F & G
Hazardous locations Class I, Zone I
AEx d m IIC T6 @ 70˚C
AS, BS - Intrinsically Safe Class I, II, III, Div. 1, Groups A-G, Class I, Zone 0, AEx ia IIC T6 @ 70˚C, ATEX EEx i a IIC

Optional Features

Specify suffix codes for manual operators

MI - Momentary (push in & hold)
MS - Sustained (push in & turn)

Entity Parameters for Intrinsically Safe options AS & BS

Groups A-G	V max	I max	P max	Capacitance	Inductance
Parameters	30 VDC	100 mA	0.75 w	0 nF	2.2 mH

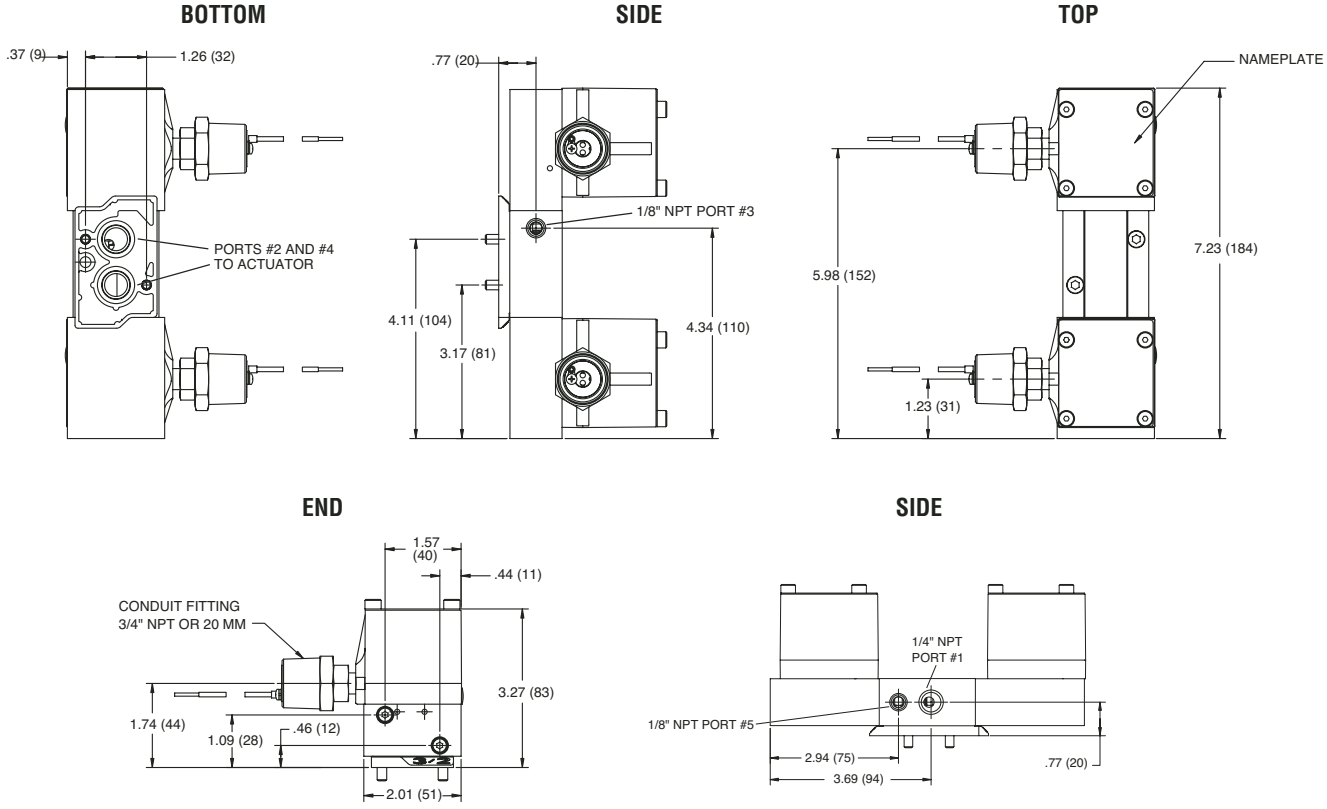
Specifications

Pipe size (ins.)	Orifice Dia. (ins.)	Cv Flow	Operating Pressure Differential (psi)		Media	Max. Fluid Temp.˚F	Nickel Plated Brass
			Min.	Max. AC/DC Air-Inert Gas			
(1) 1/4 (pressure)	(2) 1/8 (pressure)	0.7	35	145	AIR	140	8551A742

	Enclosure	Voltage	Options
Ordering Example: 8551A742	EE	AG	MI

Dimensions Inches (mm)

Const. Ref. 3



Slip-Lok Connector

for attaching conduit and instruments

ASCO®
Valve Monitoring Systems

Features

- Patented two piece design for easy installation of equipment in hazardous locations.
- Allows for optimal positioning of components, and locks them into position.
- Reduces time required for connecting and disconnecting conduit from instruments.
- Male NPT threaded connections - No special adapters needed.
- All 303 stainless steel construction to resist corrosion.

Construction

Part	Material
Body	303 Stainless Steel
O-Ring	Buna "N"

Ambient Temperatures

-20˚F to 180˚F

Ratings and Approvals

UL approved
For use in hazardous areas
Class I, Groups A, B, C & D
Class II, Groups E, F & G
Division 1 and 2

Optional Features

Please consult ASCO for alternative body threading, materials, and/or elastomers.

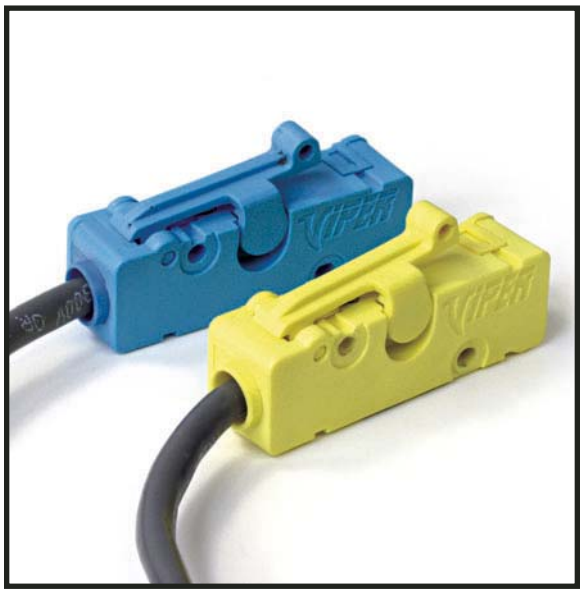
Important: The Slip-Lok is to be used as an electrical conduit connection only. **DO NOT** use as a connection in a pressurized pipe.

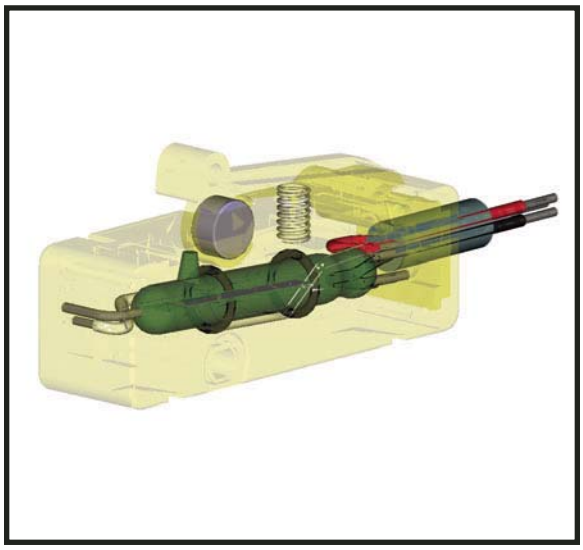
Note:

See list price schedule for available Slip-lok kits.

Features

- Unique patented design with integrated magnet, eliminates the need for cams with magnets.
- Encapsulated design provides long life and low maintenance.
- Hermetically sealed and potted switch elements.
- Utilizes SPDT Form C contacts.
- Small movement for high accuracy and low hysteresis.
- V3 mounting pattern allows for easy replacement of mechanical switches.





Construction

Part	Material
Contacts	Tungsten or Rhodium
Spring	302 Stainless Steel
Housing	PBT
Actuating Lever	PBT
Potting	RTV Silicone

Ambient Temperatures

-20˚F to 150˚F

Electrical

Tungsten: 3A/120VAC, 2A/24VDC
Rhodium: 1A/24VDC
Rhodium(IS): Suitable for IS applications (IS) rated to
Class I,II,III, Div. 1, Groups A,B,C,D,E,F, & G
Operating Time: 3.0 milliseconds
Initial Contact resistance: Tungsten 0.5 ohms
Rhodium 0.1 ohms

Note: Viper Switches have been successfully tested to greater than 1 million cycles.

Approvals

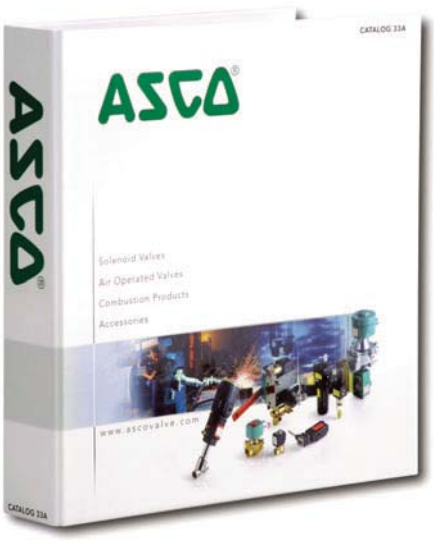
FM & CSA when used in ASCO VMS VR & HS Series indicator boxes.

Switch Codes

	Switch Code
Tungsten	T
Rhodium (Nonincendive)	R
Rhodium (Intrinsically Safe)	G

Note: *See list price schedule for available Viper Switch kits.*

ASCO offers a complete catalog of products and accessories to satisfy any of your application needs. Visit us online at www.ascovalve.com to view our full line of products.



Red-Hat Solenoid Valves

The largest selection of 2, 3, and 4-way solenoid valves, designed to handle the most demanding fluid control applications.

ASCO Scientific

Highest quality micro-miniature solenoid valves for medical and analytical applications.

Pneumatic Controls

Directional control valves, air preparation equipment, actuators, and accessories for fluid power applications.

Next Generation Solenoid Valves

The Next Generation of solenoid valves provides lower operating cost, and represents an advancement in the performance, reliability, and ruggedness that you have come to expect from ASCO.

Process Automation

Pilot valves and control accessories for reliable process solutions.

Pressure and Temperature Sensing

Devices for pressure and temperature monitoring.

ASCO S Series

Compact valve solutions for commercial applications.

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Tel 519-758-2700

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Tel (61) 2-9-451-7077

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Tel (55) 11-4195-5333

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France
Tel (33) 1-47-14-32-00

Germany
Tel (49)-7237-9960

United Kingdom
Tel (44) 1695-724270

China
Tel (852) 2-343-8580

Singapore
Tel (65) 6556-1100

Japan
Tel (81) 798-65-6361