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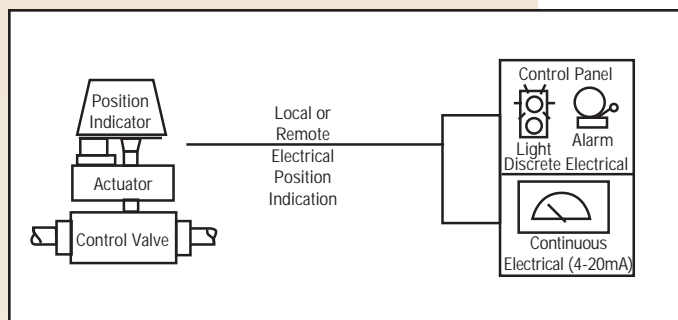
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Hart® is a registered trademark of the HART Communications Foundation.

Severe Environments Demand Reliable Position Indicators

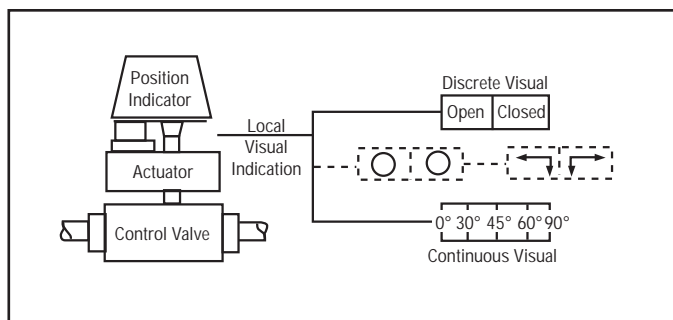
*Magnetic drive units completely
sealed providing maximum
hazard and leak protection.*





Proximity® Mark Series valve position indicator is perfect for valve position indication on offshore oil rigs.

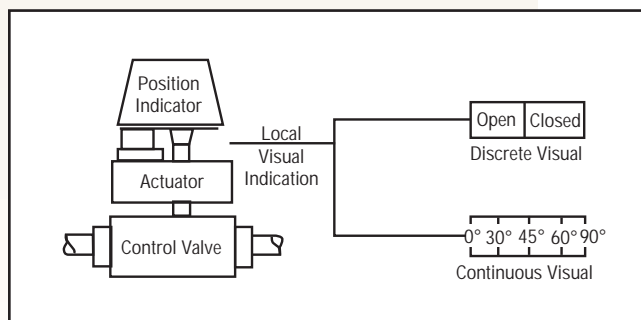
Proximity® Mark Series position indicator is utilized in valve automation packages in harsh environments. The Mark Series mounts onto the top of rotary valve actuators and connects to the actuator shaft or attaches to the shaft of a linear valve for indicating valve position. Standard with the Mark Series is visual position indication with "OPEN", "CLOSED", and degree position status. The Mark Series is available with continuous position retransmission with a 4 to 20 mA output and up to six adjustable position indication switches for remote indication of valve status. Remote status transmitter is used for indication of exact valve position and switches provide discrete indication of valve open and closed status in the control room. The Mark Series is perfect for this application because of the 316 SS enclosure that withstands the sea spray environment, and the patented magnetic drive mechanism that completely seals the switch cavity from the environment.



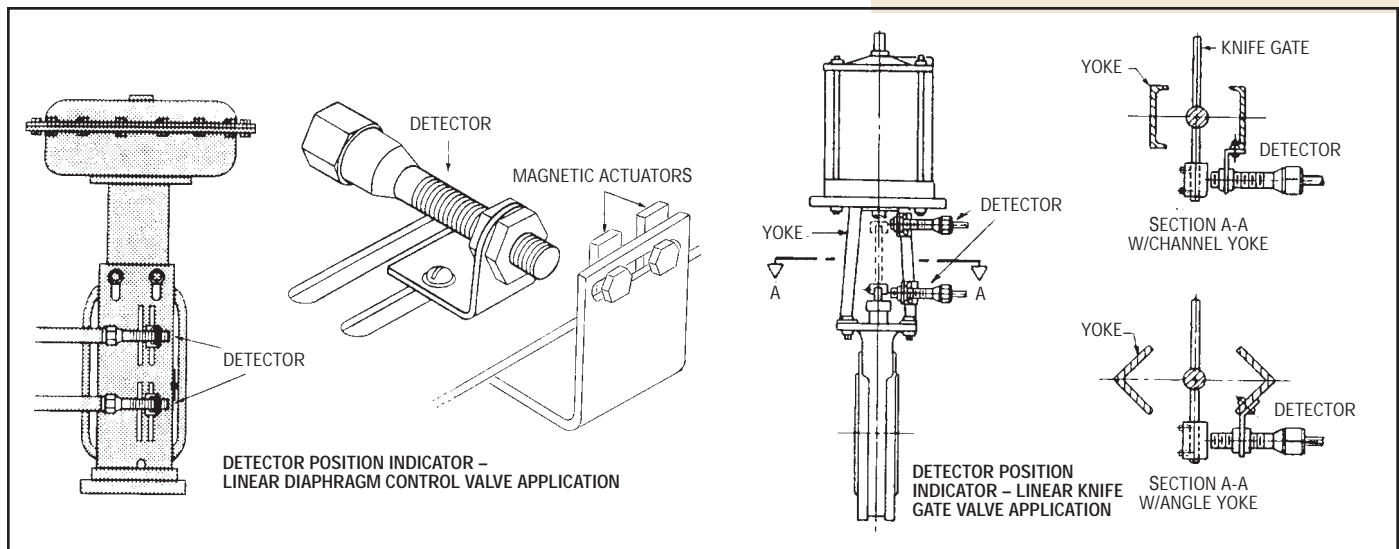
Visual valve position indication with Proximity® explosion-proof position indicators provides convenience and enhanced safety in valve monitoring.

For the convenience of the control valve user, a compact, adjustable stainless steel visual indicator is provided on all direct-drive Proximity® position indicating switches and transmitters. These industrial switches are commonly mounted on quarter-turn pneumatic actuators and valves. A magnetic design provides maximum safety by allowing complete sealing of the switch cavity. Over 2000 specific applications are covered with an extensive line of mounting kits built for individual valve and actuator brands and model numbers. As the valve and actuator is cycled, the input shaft of the position indicator rotates, causing a stainless steel cylinder to rotate inside a second stainless steel cylinder with windows. When the valve is open the word "OPEN" appears in the two windows located 180° apart. The compact and durable visual indicator displays discrete endpoints (OPEN or CLOSED) as well as scaled degrees (0-90). LED and flow path outputs are available options. Up to 3 conduit entrances allow utilization of this flexible indicator as a junction box for additional convenience as well as material and labor cost reduction to the user.

Proximity® Series QV indicates valve position locally and remotely.



Proximity® Series QV position indicator is utilized in valve automation package. Quarter turn valves such as ball and butterfly valves are often automated with pneumatic or electric actuators. The actuator connects to the shaft of the valve and rotates it. Usually the actuator has a shaft of its own that comes out of the top and rotates as the actuator rotates the valve. The QV mounts onto the top of the actuator and connects to this actuator shaft for indicating valve position. When the valve is open or closed, the corresponding word "OPEN" or "CLOSED" appears in four windows 90° apart. The visual indicator also includes degree position indication of 0 to 90°. The QV is compact yet the visual indicator is large and easy to view from a distance. Adjustable position indication switches are available to remotely indicate if the valve is fully opened or closed. The QV assures proper operation of the valve and indicates problems so they can quickly be addressed.



Proximity Detector™ is perfect for position indication of linear valves.

The Detector™ is ideal for positive indication of open or closed status of linear valves. The Detector™ is a position switch that is tripped by an actuator that contains a magnet. The compact Detector™ is easily mounted onto a linear valve body with its standard mounting nuts. The actuator is a bolt that can easily be attached to the valve shaft or valve moving parts. As the actuator bolt comes in proximity to the Detector™ the magnet activates the switch giving an output verifying valve position. The examples above show the Detector™ used with a linear pneumatic actuator that could be connected to a globe or diaphragm valve and used with a linear knife gate valve.

Harsh applications are great uses for the Detector™. The Detector™ is constructed of 316 SS and is hermetically sealed, explosion-proof, and intrinsically safe. The Detector™ can also be mounted in any position.

Mark Series Position Indicators/Switches/Transmitters



Mark 1 –
Polyester Coated
Aluminum

Mark 1 –
Stainless Steel



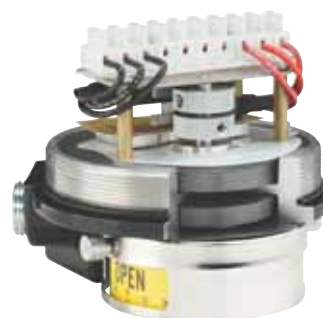
Environmentally sealed for corrosive areas.

The Proximity Mark Series is a line of position indicators with a selection of various output options. Three model styles make up the Mark series to cover almost any application. Standard models in the Mark Series have visual position indicators and are weatherproof, explosion-proof, and submersible. A large variety of outputs are available to fit specific applications. There is a choice of 1 to 6 switch outputs of 16 varieties including inductive sensors, high temperature switches, gold contact switches, hermetically sealed switches, and high current switches. Besides the switch outputs the Series offers potentiometer outputs and 4 to 20 mA transmitters. The units are purchased for either direct drive applications, such as rotary valves, or lever drive applications, such as linear valves. Adjustable visual indicator is standard on direct drive units that displays OPEN / CLOSED status and degrees.

A patented magnetic drive that completely seals the switch compartment from the atmosphere for maximum leak protection is utilized in the Mark 1. The Mark 3 uses the same magnetic drive of the Mark 1, but it can be used for multi-turn applications with 1 to 25 revolutions, such as gate valves. A through shaft drive is incorporated in the Mark 4 making the unit a lower cost alternative to the Mark 1 for applications that are not as demanding.

Mark 1 Magnetic Coupling

- Features a patented magnetic coupling that isolates the switch compartment, completely sealing the unit from the surrounding atmosphere for maximum hazard and leak protection.
- EZset cams on switch models provide simple set point adjustment.
- Flexible design allows multiple switches and transmitter options.
- Ideal for corrosive environments.



Mark 3 Multi-Turn

- Features a patented magnetic coupling that isolates the switch compartment, completely sealing the unit from the surrounding atmosphere for maximum hazard and leak protection.
- Multi-Turn models that can provide switch signals between 1 and 25 revolutions, and transmitter models for up to 10 revolutions without gear reduction.
- Flexible design allows multiple switches and transmitter options.
- Ideal for corrosive environments.

Mark 4 Thru Shaft

- Thru-Shaft design that features a 1" bushing for long life and o-rings to seal the switch compartment for hazard, corrosion, and leak protection.
- EZset cams on switch models provide simple set point adjustment.
- Flexible design allows multiple switches and transmitter options.
- A lower cost alternative to the Mark 1 Series for less demanding applications.





Mark Series Position Indicators/Switches/Transmitters



HART® Communications

- Available on Mark 1, 3, and 4 model indicators
- 4 to 20 mA analog position transmitter with HART® communications
- HART® features include:
 - Digital indication of position
 - 4 digital programmable position switches
 - Calibration of zero and span at the device from pushbuttons or through HART® master
 - Indication of sensor failure, programmable to 3.8 or 21 mA
 - Programmable dampening
 - Self test

Junction Package

Complete factory assembled packages combine visual indication, solenoids, switches and transmitter in a single convenient UL, CSA, ATEX, or SAA certified assembly which saves labor and reduces cost. The simple package is shipped ready for installation, complete with a custom designed mounting kit for your specific application. Many options are available such as painted aluminum, epoxy coated aluminum or stainless steel housings including a standard 3/4" NPT conduit entrance and choice of 1 or 2 additional 1/2" NPT conduit entrances. The optional conduit entrances are drilled and tapped in the base of the position indicator housing and solenoid valves are screwed into the entrances. 22 to 16 AWG wire leads from solenoids, switches and optional transmitter are terminated in prelabeled, easy-access terminal strips protected inside the housing. Note: UL, CSA, ATEX, or SAA approval requires complete package assembly by Proximity. Consult the factory for recommended UL, CSA, ATEX, or SAA approved solenoid valve options.



Factory Sealed Leads

Eliminate the possibility of conduit contamination and the need for seal fittings with Proximity's factory sealed (potted) leads. This seal has been UL tested to 6000 psi (413 bar) and listed for Class I, Groups A, B, C, D; Div. 1 & 2 atmospheres. Groups may vary depending on the switch model. Standard leads are 16 AWG and 36" (91.44 cm) long.

AS-Interface

- AS-Interface allowing networking of up to 31 devices over a 2-wire network
- Option for Mark 1 Magnetic Drive and Mark 4 Thru-Shaft Valve Position Indicators
- Available with 1 or 2 incorporated solenoid valves





Mark Series Model Chart

Construction	1 3 4		Mark 1, Magnetic Coupling Mark 3, Multi-Turn Mark 4, Thru-Shaft	Available Options "A" signifies available with corresponding construction style.		
				Mark		
				1	3	4
Output Type	1		1 Switch	A	--	A
	2		2 Switches	A	A	A
	3		Potentiometer, 1K Ohm. Available with switches, see note below.*	A	A	A
	32		Potentiometer, 2K Ohm. Available with switches, see note below.*	A	A	A
	35		Potentiometer, 5K Ohm. Available with switches, see note below.*	A	A	A
	310		Potentiometer, 10K Ohm. Available with switches, see note below.*	A	A	A
	320		Potentiometer, 20K Ohm. Available with switches, see note below.*	A	A	A
	4		4 Switches	A	A	A
	5		Transmitter, 4 to 20mA. Available with switches, see note below.*	A	A	A
	6		6 Switches. Available with Switch Types B, C, I, R, V, W.	A	A	A
Switch Type & Rating	7		AS-interface and 1 Switch. Available with Switch Types B, I, R, W.	A	--	A
	8		AS-interface and 2 Switches. Available with Switch Types B, I, R, W.	A	--	A
	9		HART® Transmitter. Available with switches, see note below.*	A	A	A
		A	SPDT Snap, Rated: 15A @ 125/250/480 VAC (~); 1/8 hp @ 125 VAC (~), 1/4 hp @ 250 VAC (~), 1/2A @ 125 VDC (=), 1/4A @ 250 VDC (=).	A	A	A
		B	Inductive Sensor. 10 to 30 VDC (=). Load: 0.1A.	A	--	A
		C	SPDT High Temperature Snap, 350°F (176°C) for 600 hours, Rated: 15.1A @ 125/250/277 VAC (~).	A	A	A
		D	DPDT Snap, Rated: 10A @ 125/250 VAC (~), 0.3A @ 125 VDC (=), 0.15A @ 250 VDC (=).	A	A	A
		G	SPDT Gold Contact Snap, Rated: 1A @ 125 VAC (~).	A	A	A
		H	SPDT Hermetically Sealed Snap, Rated: 1A @ 125 VAC (=).	A	--	A
		I	NAMUR Inductive Sensor. 15 mA max @ 5-25 VDC (~).	A	--	A
Driving Method		M	SPDT Magnetic Blow-Out, Rated: 10A @ 125 VAC (~) /VDC (=), 1/4 hp @ 125 VAC (~) /VDC (=).	A	A	A
		O	No Switches	A	A	A
		R	SPDT Hermetically Sealed Reed, Rated: 2A @ 125 VAC (~), 2A @ 24 VDC (=).	A	--	A
		S	SPDT Snap, Rated: 4A @ 125/250 VAC (~).	A	--	A
		T	SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5A @ 125/250/480 VAC (~).	A	A	A
		V	SPDT Snap, Rated: 10A @ 125/250 VAC (~), 1/3 hp @ 125/250 VAC (~), 1/2A @ 125 VDC (=), 1/4A @ 250 VDC (=), 4A @ 125 VAC (~) (tungsten).	A	A	A
		W	SPDT Gold Contact Snap, Rated 0.1A @ 125 VAC (~).	A	A	A
	D		Direct Drive (Yoke) with Stainless Steel Visual Indicator.	A	A	A
	L		Lever Drive (Shaft), No Visual Indicator.	A	A	A
Enclosure	0		Aluminum, Painted Black	A	A	A
	1		Aluminum, Painted White Epoxy with SS trim	A	A	A
	2		Aluminum, Painted Red	A	A	A
	3		Cast Bronze (Optional Wording)	A	A	A
	4		Aluminum, Painted Blue	A	A	A
	6		Cast 316 Stainless Steel	A	A	A
Options		J1	Junction Package with One 1/2" NPT Female Conduit Connection and Terminal Strip.	A	A	A
		J2	Junction Package with Two 1/2" NPT Female Conduit Connection and Terminal Strip.	A	A	A
		S	SAA Listed Flameproof	A	A	A
		SV1	1 Attached Solenoid Valve (Must be ordered with J1 option).	A	--	A
		SV2	2 Attached Solenoid Valves (Must be ordered with J2 option).	A	--	A
		MT	Metric Threaded Conduit Connection, M25 (M20 for optional J1 and J2 connections).	A	A	A
		B	Directive 94/9/EC, KEMA 03 ATEX 2391, II 2 G Ex d IIC T6 (-25/-40/-50°C \uparrow \leq Tamb \leq 70°C) (T5 (-25/-40/-50°C \uparrow \leq Tamb \leq 80°C) optional wording).	A	A	A
		IS	Directive 94/9/EC, KEMA 03 ATEX 1392 x, II 1 G Ex ia IIC T4.	A	A	A

*Note: Mark 1 and 4 potentiometer and transmitter outputs will have no switches when ordered with switch type 0; 2 switches if ordered with switch types B, C, I, R, V, or W; and 4 switches if ordered with switch type S. Mark 3 potentiometer and transmitter outputs will have no switches when ordered with switch type 0, and 2 switches if ordered with switch types A, G, M or T.

††Minimum temperature depends on output and switch type selected.

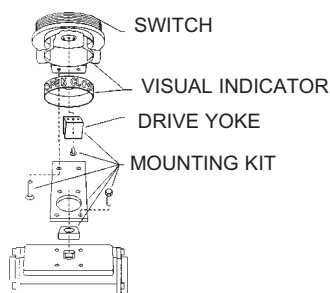
EXAMPLE MODEL NUMBERS

12VD0-J1

Mark 1, 2 Switches both Type V – SPDT, Direct Drive, Painted Aluminum Enclosure with Junction Package.

15VD0

Mark 1, 2 Switches both Type V – SPDT, 4 to 20 mA transmitter, Direct Drive, Painted Aluminum Enclosure.



Mounting kits with drive yoke (see drawing), or slotted lever arm, bracket, fasteners and other zinc plated or stainless steel hardware fit over 2000 popular valves and actuators. A high strength spring tempered stainless steel drive yoke/coupling is tailored to fit securely to a specific valve or actuator stem. There is no slippage or binding. No special alignment fixtures are required due to switch offset design and yoke to stem engagement that makes installation a "snap". Each kit is specially designed for a particular valve or actuator, making field mounting simple with standard tools. Please specify make and model of valve or actuator on order.

Mounting kits can be used interchangeably with all models since external mounting features are identical. Rotary valves utilize direct drive couplings and a slotted lever drive is used with linear valves. Lever drives convert linear motion to rotary. Stainless steel visual indicators are standard for direct drive, automated quarter-turn valve applications.

SPECIFICATIONS

General

Product Ratings:

Weatherproof and flameproof. NEMA 1, 2, 3, 3R, 3S, 4, 4X, 6, 7, 9, 12, 13.

UL rated: Class I, Div. 1 & 2, Groups B, C, D (Some units available for Group A, consult factory); Class II, Div. 1 & 2, Groups E, F, and G.

CSA rated: Class I, Div. 1 & 2, Groups A, B, C, D; Class II, Div. 1 & 2, Groups E, F, and G; Submersible to 50 feet.

SAA rated: -S suffix, Certified Ex d IIC T6 IP68 (15 meters).

ATEX Compliant:

-B suffix, directive 94/9/EC.

KEMA 03 ATEX 2391, **CE** **Ex** II 2 G Ex d IIC T6 for -25°C/-40°F/-50°C ≤ Tamb ≤ 70°C and T5 for (-25°C/-40°F/-50°C ≤ Tamb ≤ 80°C optional wording) depending on output and switch type selected.

-IS suffix directive 94/9/EC.

KEMA 03 ATEX 1392X, **CE** **Ex** II 1 G Ex ia IIC T4.

(Switch type C is not available with ATEX; Switch type B is not available with ATEX intrinsically safe, -IS suffix).

Electrical Connections: Screw terminal. Optional factory sealed leads that are 36" (914.4 mm) of 16 AWG.

Conduit Connection: 3/4" female NPT standard. Optional one or two 1/2" female NPT. M25 and M20 optional (Standard on SAA certified products).

Mounting Orientation: Not position sensitive.

Weight: 4 to 6 lb (1.5 to 3.0 kg).

Operational Life: 10,000,000 cycles.

Maximum Altitude: 2000 meters.

Mark 1, 3 and 4 with Switch Outputs

Temperature Limits: -58 to 176°F (-50 to 80°C). Switch Type C rated to 350°F (176°C) for 600 hours, Switch Type T rated to 250°F (121°C) continuous. (ATEX flameproof, -B suffix, rated -50°C (-58°F) to 80°C (176°F) for switch type A, G, H, T, or M, -40°C (-40°F) to 80°C (176°F) for switch type O, R, S, V, or W, -25°C (-13°F) to 80°C (176°F) for switch type B, D, I, or AS Interface; ATEX intrinsically safe, -IS suffix rated -25°C (-13°F) to 40°C (104°F) for switch type D or I, -40°C (-40°F) to 40°C (104°F) for switch type R, V, or W, or -50°C (-58°F) to 40°C (104°F) for switch type A, G, or H.)

Switch Type: See model chart on page 8.

Electrical Rating: See model chart on page 8.

Set Point Adjustment: Mark 1 and 4: 5 to 360°. Mark 3: 1 to 25 revolutions.

Mark 1, 3, and 4 with Potentiometer

Accuracy: ± 0.5% of full span. Optional ± 0.25% of full span.

Temperature Limits: -40 to 176°F (-40 to 80°C). (ATEX flameproof, -B suffix, rated -40°C (-40°F) to 80°C (176°F) for switch types A, G, M, O, R, S, T, V, or W, -25°C (-13°F) to 80°C (176°F) for switch types B, D, or I.; ATEX intrinsically safe, -IS suffix, rated -25°C (-13°F) to 40°C (104°F) for switch type I, -40°C (-40°F) to 40°C (104°F) for switch types O, R, S, V, or W.)

Power Rating: 1.5 Watt maximum.

Output Signal: 1000 Ohm standard. Optional 2000, 5000, 10000, or 20000 Ohms.

Zero and Span Adjustments: Span trim pot with 2000 Ohm adjustment. No zero adjustment.

Rotational Travel: Mark 1 and 4: Minimum: 0°, Maximum: 340°. Mark 3: 0 to 10 revolutions.

Mark 1, 3, and 4 with Transmitter

Accuracy: ± 0.5% of full span. Optional ± 0.25% of full span.

Temperature Limits: -40 to 176°F (-40 to 80°C). (ATEX flameproof, -B suffix, rated -40°C (-40°F) to 80°C (176°F) for switch types A, G, M, O, R, S, T, V, or W, -25°C (-13°F) to 80°C (176°F) for switch types B, D, or I.; ATEX intrinsically safe, -IS suffix, rated -25°C (-13°F) to 40°C (104°F) for switch type I, -40°C (-40°F) to 40°C (104°F) for switch types O, R, S, V, or W.)

Power Requirements: 5 to 30 VDC.

Current Consumption: 50 mA.

Output Signal: 4 to 20 mA.

Zero and Span Adjustments: Trim pots for adjusting both. Mark 1 and 4: Span is adjustable from 50 to 300°. Mark 3: Span is adjustable from 1.5 to 8.5 revolutions.

Conduit Connection: 3/4" female NPT standard. Optional one or two 1/2" female NPT. M25 and M20 optional (Standard on SAA models).

Rotational Travel: Mark 1 and 4: Minimum: 50°, Maximum: 300°. Mark 3: Minimum: 1.5 revolutions, Maximum: 8.5 revolutions.

Mark 1, 3, and 4 with HART® Transmitter

Accuracy: ± 0.5% of full span. Optional ± 0.25% of full span.

Temperature Limits: -40 to 176°F (-40 to 80°C). (ATEX flameproof, -B suffix, rated -40°C (-40°F) to 80°C (176°F) for switch types A, G, M, O, R, S, V or W, -25°C (-13°F) to 80°C (176°F) for switch types B, D or I.)

Power Requirements: 8 to 30 VDC.

Current Consumption: 21 mA.

Output Signal: 4 to 20 mA.

HART® Receive Impedance: Rx = 500 kΩ; Cx = 2500 pF.

Zero and Span Adjustments: Pushbuttons or HART master for setting both. Mark 1 and 4: Span is adjustable from 0 to 330°. Mark 3: Span is adjustable from 1.5 to 8.5 revolutions.

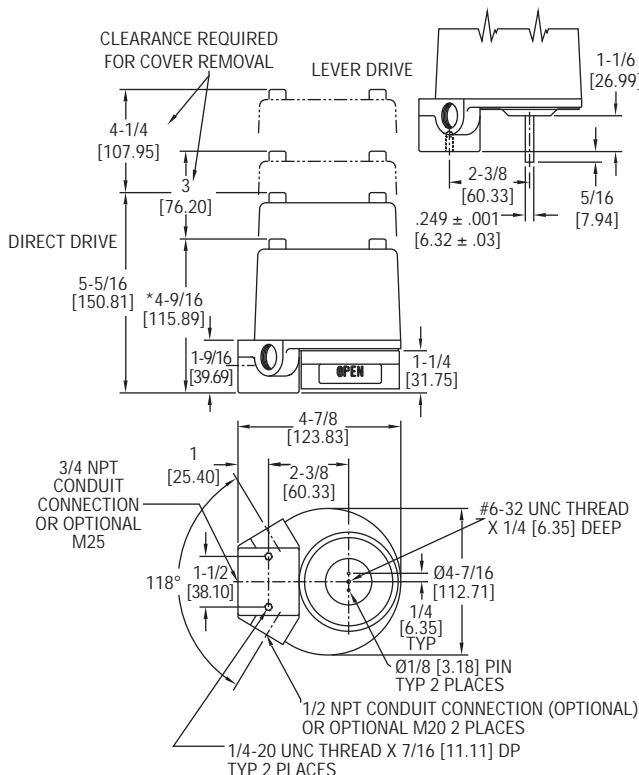
Conduit Connection: 3/4" female NPT standard. Optional one or two 1/2" female NPT. M25 and M20 optional (Standard on SAA models).

Rotational Travel: Mark 1 and 4: Maximum: 330°. Mark 3: Minimum: 1.5 revolutions, Maximum: 8.5 revolutions.

Magnetically Coupled Switches and Transmitters Ideal for Corrosive Environments



Cutaway View Model 12VD0J2 Shown



*FOR MODELS 11, 12, 41, 42, 61 & 62

BENEFITS

- The switch compartment is completely isolated from atmosphere.
- A magnetic coupling completely seals the switch compartment for maximum hazard and leak protection, (IP68 and submersible to 50 feet indefinitely).
- Set screw cams provide infinite adjustment, and user-friendly manual cams provide single-step rotational adjustment and locking set screw.
- Flexible design allows multiple mechanical or proximity switches and transmitter option(s).
- Adjustable stainless steel visual indicator with scale is standard for quarter turn direct drive applications.
- Housing options include 1, 2 or 3 conduit entrances, junction package, terminal strip and solenoid valve option(s).
- Mounting hardware is available in plated or stainless steel material for your specific requirements, including rotary, linear and NAMUR mounting hardware.

APPLICATIONS

- Rotary valve actuators and dampers
- Linear valve actuators and cylinders
- Manual valves
- Gear operators
- Positioners

SPECIFICATIONS

Minimum Rotational Travel: 5°.

Maximum Rotational Travel: 360°.

Operational Life: 10,000,000 cycles.

Weight: 3 lb (1.5 kg) to 6 lb (3.0 kg).

Maximum Altitude: 2000 m (6560 ft).

See page 9 for other specifications.

SUGGESTED SPECIFICATION

Position indicators shall be magnetically coupled Proximity model 1XXXXXX. The (indicator)(transmitter)(potentiometer) shall include 0(1)(2)(4)(6) switch(es). The switch(es) shall be SPDT(DPDT)(NAMUR)(Magnetic Blow-out) mechanical (proximity) rated at _____ amps. The coupling shall be direct (lever) drive. The housing shall be painted aluminum (epoxy coated) (stainless steel) with a screw-on cover. The housing shall include one 3/4" NPT conduit entrance, 0(1)(2) 1/2" NPT conduit entrance(s) and a terminal strip. It shall be NEMA 4, 4X, 7, 9, UL/CSA certified Class I Groups A, B, C, D(B,C,D), Divisions 1 and 2 (ATEX Flameproof) (ATEX Intrinsically Safe-IS) (SAA Flameproof). See reverse side for complete specifications and ordering information. The Proximity indicator part number shall be: 1XXXXXX.

Specifications and Ordering Information

1	Mark 1, Magnetic Coupling			
FUNCTION DATA				
1	1 Switch*			
2	2 Switches*			
3	Potentiometer, 1K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†			
32	Potentiometer, 2K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†			
35	Potentiometer, 5K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†			
310	Potentiometer, 10K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†			
320	Potentiometer, 20K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†			
4	4 Switches*			
5	Transmitter, 4 to 20 mA. Available with Switch Types B, C, I, O, R, S, V, W*†			
6	6 Switches. Available with Switch Types B, C, I, R, V, W			
7	AS-interface and 1 Switch. Available with Switch Types B, I, R, W*			
8	AS-interface and 2 Switches. Available with Switch Types B, I, R, W*			
9	HART® Transmitter. Available with Switch Types B, C, I, O, R, S, V, W*†			
SWITCH DATA				
O	No Switches*.			
A	SPDT Snap, Rated: 15A @ 125/250/480 VAC (-), 1/8 hp @ 125 VAC (-), 1/4 hp @ 250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡).			
B	Inductive sensor. 10 to 30 VDC (≡) Load: 0.1A*.			
C	SPDT High Temperature Snap, 350°F (176°C) for 600 hours. Rated: 15.1A @ 125/250/277 VAC (-)*.			
D	DPDT Snap, Rated: 10A @ 125/250 VAC (-), 0.3A @ 125 VDC (≡), 0.15A @ 250 VDC (≡).			
G	SPDT Gold Contact Snap, Rated: 1A @ 125 VAC (-).			
H	SPDT Hermetically Sealed Snap, Rated: 1A @ 125 VAC (-).			
I	NAMUR Inductive Sensor. 15 mA max @ 5-25 VDC (≡)*.			
M	SPDT Magnetic Blow Out, Rated: 10A @ 125 VAC (-)/VDC (≡), 1/4 hp @ 125 vac (-)/VDC (≡).			
R	SPDT Hermetically Sealed Reed, Rated: 2A @ 125 VAC (-), 2A @ 24 VDC (≡)*.			
S	SPDT Snap, Rated: 4A @ 125/250 VAC (-).			
T	SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5A @ 125/250/480 VAC (-).			
V	SPDT Snap, Rated: 11A @ 125/250 VAC (-), 1/3 hp @ 125/250 VAC (-), 1/2 A @ 125 VDC (≡), 1/4A @ 250 VDC (≡), 4A @ 125 VAC (-) (tungsten)*.			
W	SPDT Gold Contract Snap, Rated: 0.1A @ 125 VAC (-)*.			
DRIVING METHOD				
D	Direct Drive, Stainless Steel Visual Indicator Standard*			
L	Lever Drive, Shaft Output*			
HOUSING MATERIAL AND FINISH				
0	Aluminum, Painted Black.* (Other colors available, consult factory)			
1	Aluminum, Painted White Epoxy with SS trim.*			
6	Cast 316 Stainless Steel*			
SPECIAL ENCLOSURE FEATURES				
J1	Junction Package with One 1/2" NPT Female Conduit Connection and Terminal Strip.*			
J2	Junction Package with Two 1/2" NPT Female Conduit Connection and Terminal Strip.*			
S	SAA Listed Flameproof*			
SV1	1 Attached Solenoid Valve (Must be ordered with J1 option)*			
SV2	2 Attached Solenoid Valve (Must be ordered with J2 option)*			
MT	Metric Threaded Conduit Connection, M25 (M20 for optional J1 and J2 connections).*			
B	Directive 94/9/EC, KEMA 03 ATEX 2391, CE II 2 G Ex d IIC T6 (-25/-40/-50°C†† ≤ Tamb ≤ 70°C) (T5 (-25/-40/-50°C†† ≤ Tamb ≤ 80°C) optional wording).*			
IS	Directive 94/9/EC, KEMA 03 ATEX 1392 X CE II 1 G Ex Ia IIC T4 (-25/-40/-50°C†† ≤ Tamb ≤ 40°C).			
1	2	A	D	0
Example of Popular Model Number				

† Potentiometer and transmitter outputs will have no switches when ordered with switch type 0, 2 switches if ordered with switch types B, C, I, R, V, or W, and 4 switches if ordered with switch type S. No other switch types are available.

††Minimum temperature depends on output and switch type selected.

*Junction Package available.

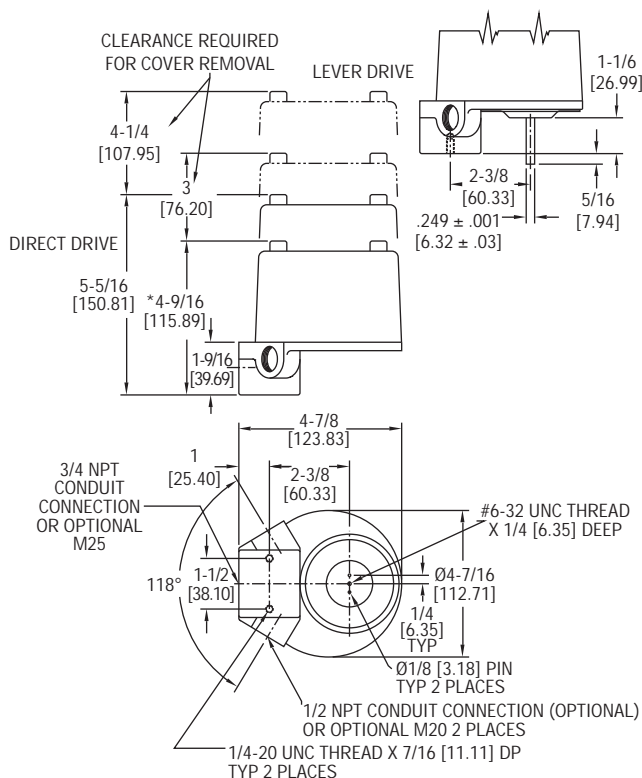
Notes:

- Consult factory for solenoid valve packages.
- SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.
- When ordering mounting kits, please supply make and model number of your actuator or valve.
- See page 9 for product ratings.

Multi-Turn Switches and Transmitters Ideal for Corrosive Environments



Cutaway View
Model 36VD0 Shown



*FOR MODELS 11, 12, 41, 42, 61 & 62

BENEFITS

- The switch compartment is completely isolated from atmosphere.
- A magnetic coupling completely seals the switch compartment for maximum hazard and leak protection, (IP68 and submersible to 50 feet indefinitely).
- Switch signals are provided between 1 and 25 revolutions. Transmitter output is available up to 10 revolutions without gear reduction.
- Flexible design allows multiple mechanical switch and transmitter option(s).
- Housing options include 1, 2 or 3 conduit entrances, for junction package with solenoid valve option(s).
- Mounting hardware available in plated or stainless steel for your specific requirements includes rotary, linear and NAMUR mounting hardware.

APPLICATIONS

- Multi-turn rotary valves and actuators
- Linear valve actuators and cylinders
- Multi-turn manual valves
- Gear operators
- Positioners

SPECIFICATIONS

Minimum Rotational Travel: One revolution.

Maximum Rotational Travel: 25 revolutions.

Operational Life: Over 10,000,000 cycles.

Weight: 4 lb (1.5 kg) to 6 lb (3.0 kg).

Maximum Altitude: 2000 m (6560 ft).

See page 9 for other specifications.

SUGGESTED SPECIFICATION

Position indicators shall be magnetically coupled Proximity Model 3XXXXXX. The indicator (transmitter) (potentiometer) shall include 0(1)(2)(4)(6) switch(es). The switch(es) shall be SPDT (DPDT) (NAMUR) (Magnetic Blow-out) mechanical rated _____ amps. The coupling shall be direct (lever) drive. The housing shall be painted aluminum(epoxy coated)(stainless steel) with screw-on cover. The housing shall include one 3/4" NPT conduit entrance and 0(1)(2) 1/2" NPT conduit entrance(s) and be NEMA 4,4X,7,9, UL/CSA certified Class I Groups A, B, C, D (B, C, D), Divisions 1 and 2 (ATEX Flameproof) (ATEX Intrinsically Safe) (SAA Flameproof). See reverse side for detailed specifications and ordering information. The Proximity part number shall be 3XXXXXX.

Specifications and Ordering Information

3	Mark 3, Multi-Turn (1-10 Revolutions)				
FUNCTION DATA					
1	1 Switch*				
2	2 Switches*				
3	Potentiometer, 1K Ohm Available with Switch Types A, G, M or T†				
32	Potentiometer, 2K Ohm Available with Switch Types A, G, M or T†				
35	Potentiometer, 5K Ohm Available with Switch Types A, G, M or T†				
310	Potentiometer, 10K Ohm Available with Switch Types A, G, M or T†				
320	Potentiometer, 20K Ohm Available with Switch Types A, G, M or T†				
4	4 Switches*				
5	Transmitter, 4 to 20 mA. Available with Switch Types A, G, M or T†				
6	6 Switches, Available with Switch Types C, V, W				
9	HART® Transmitter. Available with Switch Types A, G, M or T†.				
SWITCH DATA					
O	No Switches*.				
A	SPDT Snap, Rated: 15A @ 125/250/480 VAC (-), 1/8 hp @ 125 VAC (-), 1/4 hp @ 250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡).*				
G	SPDT Gold Contact Snap, Rated: 1A @ 125 VAC (-).*				
M	SPDT Magnetic Blow-Out, Rated: 10A @ 125 VAC (-)/VDC (≡), 1/4 hp @ 125 VAC (-)/VDC (≡).*				
T	SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5A @ 125/250/480 VAC (-).				
V	SPDT Snap, Rated: 11A @ 125/250 VAC (-), 1/3 hp @ 125/250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡), 4A @ 125 VAC (-) (tungsten).*				
W	SPDT Gold Contact Snap, Rated 0.1A @ 125 VAC (-).*				
DRIVING METHOD					
D	Direct Drive*				
L	Lever Drive, Shaft Output*				
HOUSING MATERIAL AND FINISH					
0	Aluminum, Painted Black* (Other colors available, consult factory)				
1	Aluminum, Painted White Epoxy with SS trim.*				
6	Cast 316 Stainless Steel*				
SPECIAL ENCLOSURE FEATURES					
J1	Junction Package with One 1/2" Female NPT Conduit Connection (No Terminal Strip).*				
J2	Junction Package with Two 1/2" Female NPT Conduit Connection (No Terminal Strip).*				
S	SAA Listed Flameproof*				
SV1	1 Attached Solenoid Valve (Must be ordered with J1 option)*				
SV2	2 Attached Solenoid Valve (Must be ordered with J2 option)*				
MT	Metric Threaded Conduit Connection, M25 (M20 for optional J1 and J2 connections).*				
B	Directive 94/9/EC, KEMA 03 ATEX 2391,CE II 2 G EEx d IIC T6 (-25/-40/-50°C†† ≤ Tamb ≤ 70°C) (T5 (-25/-40/-50°C†† ≤ Tamb ≤ 80°C) optional wording).*				
IS	Directive 94/9/EC, KEMA 03 ATEX 1392 X CE II 1 G EEx Ia IIC T4 (-25/-40/-50°C†† ≤ Tamb ≤ 40°C)				
3	5	O	D	0	EXAMPLE OF POPULAR MODEL NUMBER

† Potentiometer and transmitter outputs will have no switches when ordered with switch type 0, 2 switches if ordered with switch types A, G, M or T.

†† Minimum temperature depends on output and switch type selected.

* Junction Package available.

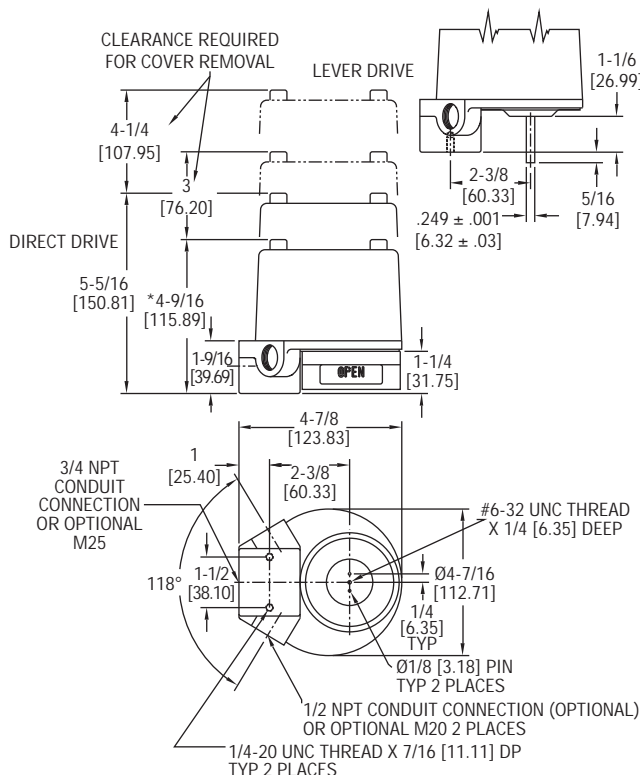
Notes:

- Consult factory for solenoid valve packages.
- SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.
- When ordering mounting kits, please supply make and model number of your actuator or valve.
- See page 9 for product ratings.

Thru-Shaft Switches and Transmitters Explosion Proof and General Purpose



Cutaway View Model 42RD0J2 Shown



*FOR MODELS 11, 12, 41, 42, 61 & 62

BENEFITS

- A shaft through a 1" bushing and O-ring seals the switch compartment for hazard, corrosion and leak protection, (IP 68 submersible).
- Set screw cams provide infinite adjustment, and user-friendly manual cams provide single-step rotational adjustment and locking set screw.
- Flexible design allows multiple mechanical or proximity switch and transmitter option(s).
- Adjustable stainless steel visual indicator with scale is standard for quarter turn direct drive applications.
- Housing options include 1, 2 or 3 conduit entrances, junction package, terminal strip and solenoid valve(s).
- Mounting hardware available in plated or stainless steel for your specific requirements includes rotary, linear and NAMUR mounting hardware.
- High temperature to 600°F (315°C) for limited duration consult factory for available options.

APPLICATIONS

- Rotary valve actuators and dampers
- Linear valve actuators and cylinders
- Manual valves
- Gear operators
- Positioners

SPECIFICATIONS

Minimum Rotational Travel: 5°.

Maximum Rotational Travel: 360°.

Operational Life: 10,000,000 cycles.

Weight: 3 lb (1.5 kg) to 6 lb (3.0 kg).

Maximum Altitude: 2000 m (6560 ft).

(Consult Factory for Pneumatic Indicator Data)

See page 9 for other specifications.

SUGGESTED SPECIFICATIONS

Position indicators shall be Proximity Model 4XXXXXX. The indicator(transmitter)(potentiometer) shall include 0(1)(2) (4)(6) switch(es). The switch(es) shall be SPDT (DPDT) (NAMUR)(Magnetic Blow-out) mechanical (proximity) rated at _____ amps. The coupling shall be direct(lever) drive. The housing shall be painted aluminum (epoxy coated) with a screw-on metal(clear plastic) cover. The housing shall include one 3/4" NPT conduit entrance and 0(1)(2) 1/2" NPT conduit entrance(s) (and terminal strip). It shall be NEMA 4,4X,7,9, UL/CSA certified Class I Groups C, D Divisions 1 and 2 (ATEX Flameproof) (ATEX Intrinsically Safe - IS) (SAA Flameproof). See reverse side for complete specifications and ordering information. The part number is 4XXXXXX.

Specifications and Ordering Information

4	Mark 4, Thru-Shaft				
FUNCTION DATA					
1	1 Switch*				
2	2 Switches*				
3	Potentiometer, 1K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†				
32	Potentiometer, 2K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†				
35	Potentiometer, 5K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†				
310	Potentiometer, 10K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†				
320	Potentiometer, 20K Ohm. Available with Switch Types B, C, I, O, R, S, V, W*†				
4	4 Switches*				
5	Transmitter, 4 to 20 mA. Available with Switch Types B, C, I, O, R, S, V, W*†				
6	6 Switches. Available with Switch Types B, C, I, R, V, W				
7	AS-interface and 1 Switch. Available with Switch Types B, I, R, W*				
8	AS-interface and 2 Switches. Available with Switch Types B, I, R, W*				
9	HART® Transmitter. Available with Switch Types B, C, I, O, R, S, V, W*†				
SWITCH DATA					
O	No Switches*.				
A	SPDT Snap, Rated: 15A @ 125/250/480 VAC (-), 1/8 hp @ 125 VAC (-), 1/4 hp @ 250 VAC (-), 1/2A @ 125 VDC (⇌), 1/4A @ 250 VDC (⇌).				
B	Inductive sensor. 10 to 30 VDC (⇌) Load: 0.1A*.				
C	SPDT High Temperature Snap, 350°F (176°C) for 600 hours. Rated: 15.1A @ 125/250/277 vac (-).*				
D	DPDT Snap, Rated: 10A @ 125/250 VAC (-), 0.3A @ 125 VDC (⇌), 0.15A @ 250 VDC (⇌).				
G	SPDT Gold Contact Snap, Rated: 1A @ 125 VAC (-).				
H	SPDT Hermetically Sealed Snap, Rated: 1A @ 125 VAC (-).				
I	NAMUR Inductive Sensor. 15 mA max @ 5-25 VDC (⇌).*				
M	SPDT Magnetic Blow Out, Rated: 10A @ 125 VAC (-)/VDC (⇌), 1/4 hp @ 125 VAC (-)/VDC (⇌).				
R	SPDT Hermetically Sealed Reed, Rated: 2A @ 125 VAC (-), 2A @ 24 VDC (⇌).*				
S	SPDT Snap, Rated: 4A @ 125/250 VAC (-).				
T	SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5A @ 125/250/480 VAC (-).				
V	SPDT Snap, Rated: 11A @ 125/250 VAC (-), 1/3 hp @ 125/250 VAC (-), 1/2 A @ 125 VDC (⇌), 1/4A @ 250 VDC (⇌), 4A @ 125 VAC (-) (tungsten)*.				
W	SPDT Gold Contract Snap, Rated: 0.1A @ 125 VAC (-)*.				
DRIVING METHOD					
D	Direct Drive, Stainless Steel Visual Indicator Standard*				
L	Lever Drive, Shaft Output*				
HOUSING MATERIAL AND FINISH					
0	Aluminum, Painted Black.* (Other colors available, consult factory)				
1	Aluminum, Painted White Epoxy with SS trim.*				
6	Cast 316 Stainless Steel*				
SPECIAL ENCLOSURE FEATURES					
J1	Junction Package with One 1/2" Female NPT Conduit Connection and Terminal Strip.*				
J2	Junction Package with Two 1/2" Female NPT Conduit Connection and Terminal Strip.*				
S	SAA Listed Flameproof*				
SV1	1 Attached Solenoid Valve (Must be ordered with J1 option)*				
SV2	2 Attached Solenoid Valve (Must be ordered with J2 option)*				
MT	Metric Threaded Conduit Connection, M25 (M20 for optional J1 and J2 connections).*				
B	Directive 94/9/EC, KEMA 03 ATEX 2391, CE II 2 G Ex d IIC T6 (-25/-40/-50°C†† ≤ Tamb ≤ 70°C) (T5 (-25/-40/-50°C†† ≤ Tamb ≤ 80°C) optional wording).*				
IS	Directive 94/9/EC, KEMA 03 ATEX 1392 X CE II 1 G Ex Ia IIC T4 (-25/-40/-50°C†† ≤ Tamb ≤ 40°C)				
4	2	A	D	0	EXAMPLE OF POPULAR MODEL NUMBER

† Potentiometer and transmitter outputs will have no switches when ordered with switch type O, 2 switches if ordered with switch types B, C, I, R, V, or W, and 4 switches if ordered with switch type S. No other switch types are available.

†† Minimum temperature depends on output and switch type selected.

* Junction Package available.

Notes:

- Consult factory for solenoid valve packages.

- SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

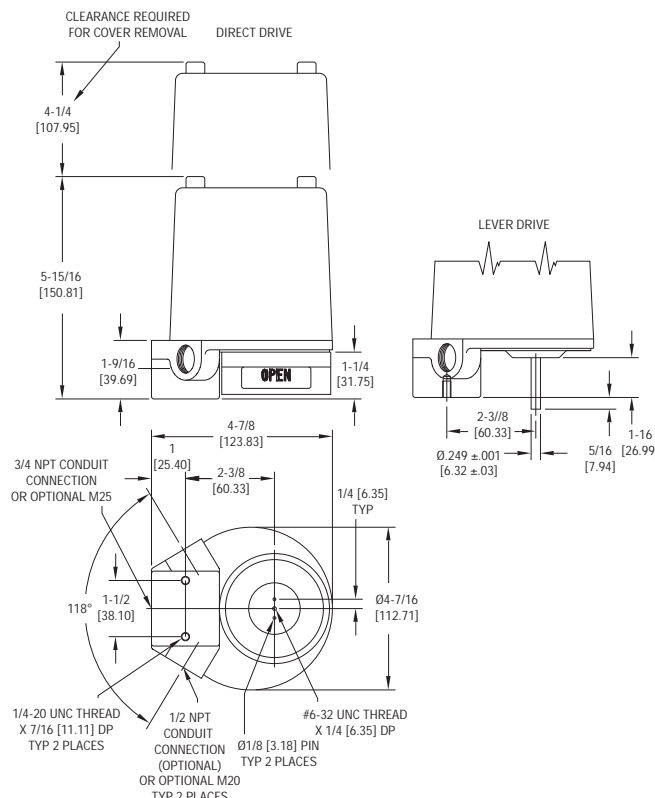
- When ordering mounting kits, please supply make and model number of your actuator or valve.

- See page 9 for product ratings.

Resistive Output Potentiometer For Mark 1,3, or 4. Infinite Resolution, 1% Linearity



Model 13VD0 Shown



BENEFITS

- Available in Mark 1, 3 and 4 model indicators.
- Infinite resolution and high accuracy assured by precision pot and helical drive coupling.
- Housings provide maximum hazard & leak protection.
- Adjustable stainless steel visual indicator with scale is standard for quarter turn direct drive applications.
- Housing options include 1, 2 or 3 conduit entrance(s) junction package, terminal strip and solenoid valve(s).
- Mounting hardware is available in plated or stainless steel material for your specific requirements, including rotary, linear and NAMUR mounting hardware.

APPLICATIONS

- Rotary valve actuators and dampers
- Linear valve actuators and cylinders
- Manual valves
- Gear operators
- Positioners

SPECIFICATIONS

Minimum Rotational Travel: Mark 1 and 4: 0°, Mark 3: 0 revolutions.

Maximum Rotational Travel: Mark 1 and 4: 340°, Mark 3: 10 revolutions.

Operational Life: 10,000,000 revolutions.

Resistance Range:

1000 (1K) ohms	2.94 ohms/degree rotation.
2000 (2K) ohms	5.88 ohms/degree rotation.
5000 (5K) ohms	14.7 ohms/degree rotation.
10000 (10K) ohms	29.4 ohms/degree rotation.
20000 (20K) ohms	58.8 ohms/degree rotation.

Linearity: ±0.5% of full span. Optional ±0.25% of full span.

Resolution: Infinite.

Power Rating:

104°F (40°C)	1.5 Watt.
257°F (125°C)	0 Watt.

Weight: 3 lb (1.5 kg) to 6 lb (3.0 kg).

Maximum Altitude: 2000 m (6560 ft).

(Consult factory for Multi-Turn Specifications)

See page 9 for other specifications.

SUGGESTED SPECIFICATION

Position potentiometers shall be Proximity model number(1)(3)(4)3XXXXX. The potentiometer shall include 0(1) (2) (4) switch(es). The switch(es) shall be SPDT (NAMUR) mechanical(proximity) rated ____ amps. The coupling shall be direct(lever) drive. The housing shall be painted aluminum(epoxy coated)(stainless steel) with a screw-on cover. The housing shall include one 3/4" NPT conduit entrance, 0(1)(2) 1/2" NPT conduit entrance(s) and terminal strip for most models. It shall be NEMA 4,4X,7,9, UL/CSA certified Class I Groups A,B,C,D(B,C,D), Divisions 1 and 2 (ATEX Flameproof) (ATEX Intrinsically Safe - IS) (SAA Flameproof). See reverse side for complete specifications and ordering information. The Proximity part number shall be (1)(3)(4) 3XXXXX.

Specifications and Ordering Information

1	Mark 1, Magnetic Coupling				
3	Mark 3, Multi-Turn, (1-10 Revolutions)				
4	Mark 4, Thru-Shaft				
FUNCTION DATA					
3	Potentiometer, 1K Ohm.†				
32	Potentiometer, 2K Ohm.†				
35	Potentiometer, 5K Ohm.†				
310	Potentiometer, 10K Ohm.†				
320	Potentiometer, 20K Ohm.†				
SWITCH DATA					
O	No Switches				
A	SPDT Snap, Rated: 15A @ 125/250/480 VAC (-), 1/8 hp @ 125 VAC (-), 1/4 hp @ 250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡). (Mark 3 Only)				
B	Inductive Sensor 10 to 30 VDC (≡), Load: 0.1A. (Mark 1 & 4 Only)				
C	SPDT High Temperature Snap, 350°F (176°C) for 600 hours, Rated: 15.1A @ 125/250/277 VAC (-). (Mark 1 & 4 only)				
G	SPDT Gold Contact Snap, Rated: 1A @ 125 VAC (-). (Mark 3 Only)				
I	NAMUR Inductive Sensor, 15 mA max @ 5-25 VDC (≡). (Mark 1 & 4 Only)				
M	SPDT Magnetic Blow-Out, Rated: 10A @ 125 VAC (-) /VDC (≡), 1/4 hp @ 125 VAC (-)/VDC (≡). (Mark 3 Only)				
R	SPDT Hermetically Sealed Reed, Rated: 2A @ 125 VAC (-), 2A @ 24 VDC (≡). (Mark 1 & 4 Only)				
S	SPDT Snap, Rated: 4A @ 125/250 VAC (-). (Mark 1& 4 Only)				
T	SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5A @ 125/250/480 VAC (-). (Mark 3 Only)				
V	SPDT Snap, Rated: 11A @ 125/250 VAC (-), 1/3 hp @ 125/250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡), 4A @ 125/250 VAC (-) (Tungsten). (Mark 1 & 4 only)				
W	SPDT Gold Contact Snap, Rated: 0.1A @ 125 VAC (-). (Mark 1 & 4 Only)				
DRIVING METHOD					
D	Direct Drive, Stainless Steel Visual Indicator Standard				
L	Lever Drive, Shaft Output				
HOUSING MATERIAL AND FINISH					
0	Aluminum, Painted Black (Other colors available, consult factory)				
1	Aluminum, Painted White Epoxy with SS Trim				
6	Cast 316 Stainless Steel				
SPECIAL ENCLOSURE FEATURES					
J1	Junction Package with One 1/2" Female NPT Conduit Connection and Terminal Strip, except Mark 3				
J2	Junction Package with Two 1/2" Female NPT Conduit Connection and Terminal Strip, except Mark 3				
S	SAA Listed Flameproof				
SV1	1 Attached Solenoid Valve (Must be ordered with J1 option)				
SV2	2 Attached Solenoid Valves (Must be ordered with J2 option)				
MT	Metric Threaded Conduit Connection, M25 (M20 for optional J1 and J2 connections)				
B	Directive 94/9/EC, KEMA 03 ATEX 2391, CE II 2 G Ex d IIC T6 (-25/-40°C†† ≤ Tamb ≤ 70°C) (T5 (-25/-40°C†† ≤ Tamb ≤ 80°C) optional wording)				
IS	Directive 94/9/EC, KEMA 03 ATEX 1392 x, CE II 1 G Ex ia IIC T4 (-25/-40°C†† ≤ Tamb ≤ 40°C)				
4	3	V	D	0	EXAMPLE OF POPULAR MODEL NUMBER

† Mark 1 and 4 potentiometer and transmitter outputs will have no switches when ordered with switch type 0; 2 switches if ordered with switch types B, C, I, R, V, or W; and 4 switches if ordered with switch type S. Mark 3 potentiometer and transmitter outputs will have no switches when ordered with switch type 0, and 2 switches if ordered with switch types A, D, G, M, or T.

†† Minimum temperature depends on output and switch type selected.

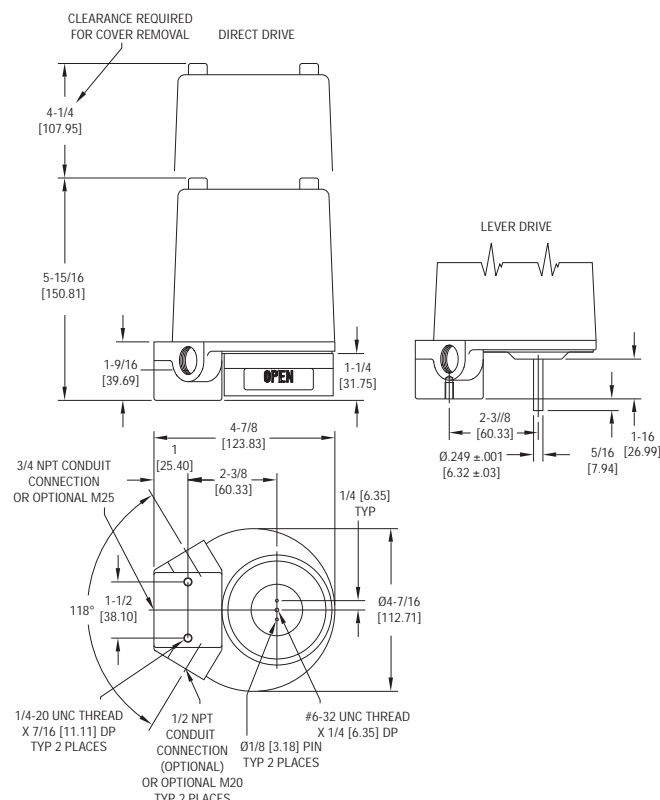
Notes:

- Consult factory for solenoid valve packages.
- SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.
- When ordering mounting kits, please supply make and model number of your actuator or valve.
- See page 9 for product ratings.

4-20 mA Position Transmitter for Feedback Control For Mark 1,3, or 4. 2-Wire



Model 15OD0 Shown



BENEFITS

- Available in Mark 1, 3 and 4 model indicators.
- Two wire 4-20 mA output ideal for computer or ammeter signal input.
- Infinite resolution and high accuracy assured by precision pot and helical drive coupling.
- Convenient and precise zero and span adjustments readily made in the lab or field locations.
- Low thermal drift and automatic thermal cutout.
- Housings provide RF and EMI protection.
- Adjustable stainless steel visual indicator with scale is standard for quarter turn direct drive applications.
- Housing options include 1, 2 or 3 conduit entrance(s) junction package, terminal strip and solenoid valve(s).
- Mounting hardware is available in plated or stainless steel material for your specific requirements, including rotary, linear and NAMUR mounting hardware.

APPLICATIONS

- Rotary valve actuators and dampers
- Linear valve actuators and cylinders
- Manual valves
- Gear operators
- Positioners

SPECIFICATIONS

Minimum Rotational Travel: Mark 1 and 4: 50°, Mark 3: 1.5 revolutions.

Maximum Rotational Travel: Mark 1 and 4: 300°, Mark 3: 8.5 revolutions.

Operational Life: 10,000,000 revolutions.

Output: 4–20 mA.

Power Requirements: 5 to 30 VDC.

Maximum Linearity Error: ±0.5% of full span. Optional ±0.25% of full span.

Load Impedance: 0 to 900 ohms.

Resolution: Infinite.

Weight: 3 lb (1.5 kg) to 6 lb (3.0 kg).



Maximum Altitude: 2000 m (6560 ft).

See page 9 for other specifications.

SUGGESTED SPECIFICATION

Position transmitters shall be Proximity model number (1)(3)(4)5XXXXX. The transmitter shall include 0(1)(2) (4)(6) switch(es). The switch(es) shall be SPDT(NAMUR) mechanical(proximity) rated at ____ amps. The coupling shall be direct(lever) drive. The housing shall be painted aluminum(epoxy coated)(stainless steel) with a screw-on cover. The housing shall include one 3/4" NPT conduit entrance, 0(1)(2) 1/2" NPT conduit entrance(s) and a terminal strip. It shall be NEMA 4,4X,7,9 UL/CSA certified Class I Groups A,B,C,D(B,C,D), Divisions 1 and 2 (ATEX Flameproof) (ATEX Intrinsically Safe - IS) (SAA Flameproof). See reverse side for complete specifications and ordering information. The Proximity part number shall be (1)(3)(4)5XXXXX.

Specifications and Ordering Information

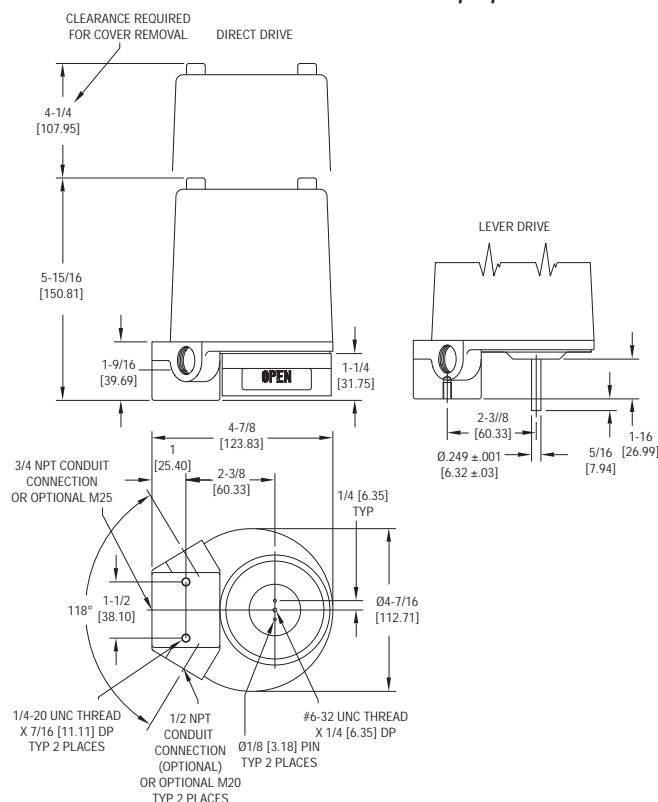
1	Mark 1, Magnetic Coupling				
3	Mark 3, Multi-Turn (1-10 Revolutions)				
4	Mark 4, Thru-Shaft				
FUNCTION DATA					
5	4-20 mA Position Transmitter & 2 Switch Elements† 4-20 mA Position Transmitter & 4 Switch Elements† 4-20 mA Position Transmitter without Switches†				
SWITCH DATA					
O	No Switches				
A	SPDT Snap, Rated: 15A @ 125/250/480 VAC (-), 1/8 HP @ 125 VAC (-) 1/4 hp @ 250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡). (Mark 3 Only)				
B	Inductive Sensor, 10 to 30 VDC (≡). Load: 0.1A. (Mark 1 & 4 Only)				
C	SPDT High Temperature Snap, 350°F (176°C) for 600 hours, Rated: 15.1A @ 125/250/277 VAC (-). (Mark 1 & 4 Only)				
G	SPDT Gold Contact Snap, Rated: 1A @ 125 VAC (-). (Mark 3 Only)				
I	NAMUR Inductive Sensor, 15 mA max @ 5-25 VDC (≡). (Mark 1 & 4 Only)				
M	SPDT Magnetic Blow-Out, Rated: 10A @ 125 VAC (-)/VDC (≡), 1/4 hp @ 125 VAC (-)/VDC (≡). (Mark 3 Only)				
R	SPDT Hermetically Sealed Reed, Rated: 2A @ 125 VAC (-), 2A @ 24 VDC (≡). (Mark 1 & 4 Only)				
S	SPDT Snap, Rated: 4A @ 125/250 VAC (-). (Mark 1 & 4 Only)				
T	SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5A @ 125/250/480 VAC (-). (Mark 3 Only)				
V	SPDT Snap, Rated: 11A @ 125/250 VAC (-), 1/3 hp @ 125/250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡), 4A @ 125 VAC (-) (tungsten). (Mark 1 & 4 Only)				
W	SPDT Gold Contact Snap, Rated: 0.1A @ 125 VAC (-). (Mark 1 & 4 Only)				
DRIVING METHOD					
D	Direct Drive, Stainless Steel Visual Indicator Standard				
L	Lever Drive, Shaft Output				
HOUSING MATERIAL AND FINISH					
0	Aluminum, Painted Black (Other colors available, consult factory)				
1	Aluminum, Painted White Epoxy with SS Trim				
6	Cast 316 Stainless Steel				
SPECIAL ENCLOSURE FEATURES					
J1	Junction Package with One 1/2" Female NPT Conduit Connection and Terminal Strip, except Mark 3				
J2	Junction Package with Two 1/2" Female NPT Conduit Connection and Terminal Strip, except Mark 3				
S	SAA Listed Flameproof				
SV1	1 Attached Solenoid Valve (Must be ordered with J1 option)				
SV2	2 Attached Solenoid Valves (Must be ordered with J2 option)				
MT	Metric Threaded Conduit Connection, M25 (M20 for optional J1 and J2 connections)				
B	Directive 94/9/EC, KEMA 03 ATEX 2391,  II 2 G Ex d IIC T6 (-25/-40°C†† ≤ Tamb ≤ 70°C) (T5 (-25/-40°C†† ≤ Tamb ≤ 80°C) optional wording)				
IS	Directive 94/9/EC, KEMA 03 ATEX 1392 x,  II 1 G Ex ia IIC T4 (-25/-40°C†† ≤ Tamb ≤ 40°C)				
1	5	V	D	0	EXAMPLE OF POPULAR MODEL NUMBER

† Mark 1 and 4 potentiometer and transmitter outputs will have no switches when ordered with switch type O; 2 switches if ordered with switch types B, C, I, R, V, or W; and 4 switches if ordered with switch type S. Mark 3 potentiometer and transmitter outputs will have no switches when ordered with switch type O, and 2 switches if ordered with switch types A, D, G, M, or T.

†† Minimum temperature depends on output and switch type selected.

Notes:

- Consult factory for solenoid valve packages.
- SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.
- When ordering mounting kits, please supply make and model number of your actuator or valve.
- See page 9 for product ratings.



- Available on Mark 1, 3, and 4 model indicators with the benefits of those designs.
- 4 to 20 mA analog position transmitter with HART® communications
- HART® features include:
 - Digital indication of position
 - 4 digital programmable position switches
 - Calibration of zero and span at the device from pushbuttons or through HART® master
 - Indication of sensor failure programmable to 3.8 or 21 mA
 - Programmable dampening
 - Self test

- Rotary valve actuators and dampers
- Linear valve actuators and cylinders
- Manual valves
- Gear operators
- Positioners

Minimum Rotational Travel: Mark 3: 1.5 revolutions.
Maximum Rotational Travel: Mark 1 and 4: 330°, Mark 3: 8.5 revolutions.
Operational Life: 10,000,000 revolutions.
Output: 4–20 mA.
Power Requirements: 8 to 30 VDC.
Maximum Linearity Error: ±0.5% of full span. Optional ±0.25% of full span.
Resolution: Infinite.
Weight: 3 lb (1.5 kg) to 6 lb (3.0 kg).
Maximum Altitude: 2000 m (6560 ft).

Position transmitters shall be Proximity model number (1)(3)(4)9XXXXXX. The transmitter shall have HART® communications and include 0(1)(2)(4)(6) switch(es). The switch(es) shall be SPDT(NAMUR) mechanical(proximity) rated at ____ amps. The coupling shall be direct(lever) drive. The housing shall be painted aluminum(epoxy coated)(stainless steel) with a screw-on cover. The housing shall include one 3/4" NPT conduit entrance, 0(1)(2) 1/2" NPT conduit entrance(s) and a terminal strip. It shall be NEMA 4,4X,7,9 UL/CSA certified Class I Groups A,B,C,D(B,C,D), Divisions 1 and 2 (ATEX Flameproof). See reverse side for complete specifications and ordering information. The Proximity part number shall be (1)(3)(4)5XXXXXX.

Specifications and Ordering Information

1	Mark 1, Magnetic Coupling				
3	Mark 3, Multi-Turn (1-10 Revolutions)				
4	Mark 4, Thru-Shaft				
FUNCTION DATA					
9	HART® Transmitter & 2 Switch Elements† HART® Transmitter & 4 Switch Elements† HART® Transmitter without Switches†				
SWITCH DATA					
O	No Switches				
A	SPDT Snap, Rated: 15A @ 125/250/480 VAC (-), 1/8 HP @ 125 VAC (-), 1/4 hp @ 250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡). (Mark 3 Only)				
B	Inductive Sensor, 10 to 30 VDC (≡). Load: 0.1A. (Mark 1 & 4 Only)				
C	SPDT High Temperature Snap, 350°F (176°C) for 600 hours, Rated: 15.1A @ 125/250/277 VAC (-). (Mark 1 & 4 Only)				
G	SPDT Gold Contact Snap, Rated: 1A @ 125 VAC (-). (Mark 3 Only)				
I	NAMUR Inductive Sensor, 15 mA max @ 5-25 VDC (≡). (Mark 1 & 4 Only)				
M	SPDT Magnetic Blow-Out, Rated: 10A @ 125 VAC (-)/VDC (≡), 1/4 hp @ 125 VAC (-)/VDC (≡). (Mark 3 Only)				
R	SPDT Hermetically Sealed Reed, Rated: 2A @ 125 VAC (-), 2A @ 24 VDC (≡). (Mark 1 & 4 Only)				
S	SPDT Snap, Rated: 4A @ 125/250 VAC (-). (Mark 1 & 4 Only)				
T	SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5A @ 125/250/480 VAC (-). (Mark 3 Only)				
V	SPDT Snap, Rated: 11A @ 125/250 VAC (-), 1/3 hp @ 125/250 VAC (-), 1/2A @ 125 VDC (≡), 1/4A @ 250 VDC (≡), 4A @ 125 VAC (-) (tungsten). (Mark 1 & 4 Only)				
W	SPDT Gold Contact Snap, Rated: 0.1A @ 125 VAC (-). (Mark 1 & 4 Only)				
DRIVING METHOD					
D	Direct Drive, Stainless Steel Visual Indicator Standard				
L	Lever Drive, Shaft Output				
HOUSING MATERIAL AND FINISH					
0	Aluminum, Painted Black (Other colors available, consult factory)				
1	Aluminum, Painted White Epoxy with SS Trim				
6	Cast 316 Stainless Steel				
SPECIAL ENCLOSURE FEATURES					
J1	Junction Package with One 1/2" Female NPT Conduit Connection and Terminal Strip, except Mark 3				
J2	Junction Package with Two 1/2" Female NPT Conduit Connection and Terminal Strip, except Mark 3				
SV1	1 Attached Solenoid Valve (Must be ordered with J1 option)				
SV2	2 Attached Solenoid Valves (Must be ordered with J2 option)				
MT	Metric Threaded Conduit Connection, M25 (M20 for optional J1 and J2 connections)				
B	Directive 94/9/EC, KEMA 03 ATEX 2391, CE II 2 G Ex d IIC T6 (-25/-40°C†† ≤ Tamb ≤ 70°C) (T5 (-25/-40°C†† ≤ Tamb ≤ 80°C) optional wording)				
1	5	V	D	0	EXAMPLE OF POPULAR MODEL NUMBER

† Mark 1 and 4 HART® transmitter outputs will have no switches when ordered with switch type 0; 2 switches if ordered with switch types B, C, I, R, V, or W; and 4 switches if ordered with switch type S. Mark 3 HART® transmitter outputs will have no switches when ordered with switch type 0, and 2 switches if ordered with switch types A, D, G, M, or T.

†† Minimum temperature depends on output and switch type selected.

Notes:

- Consult factory for solenoid valve packages.
- SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.
- When ordering mounting kits, please supply make and model number of your actuator or valve.
- See page 9 for product ratings.



Series
QV

QUICK-VIEW® Valve Position Indicator/Switch

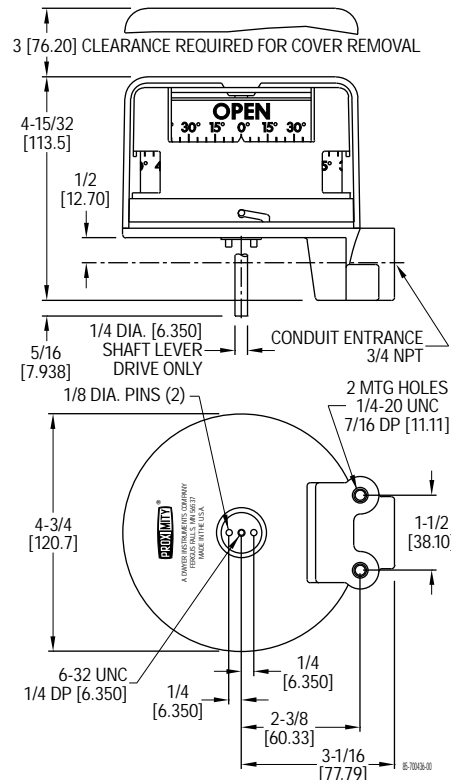
Ultra-Low Cost, Compact, Backlit, Corrosion Resistant



Backlighting Option



Internal View



FEATURES AND BENEFITS

The QUICK-VIEW® Rotary Valve Position Indicators are produced by Proximity with up to four individual mechanical or proximity switches. The QUICK-VIEW® is also available with optional backlighting. Benefits include:

- The lowest cost position indication.
- Extremely compact design.
- Easily interchangeable with key competition.
- Backlighting option available for maximum visibility.
- Integral flame retardant and corrosion protection.
- QUICK-VIEW® Indicator and mounting kits, including NAMUR kits, are stocked for fast delivery.
- Hazardous location option. Class I, Groups A, B, C, D; Class II, Groups F & G; Div. 2

APPLICATIONS

The QV Series Proximity Position Indicators are designed for maximum reliability in general purpose and corrosive environments. Applications include:

- Rotary and Linear Valves and Actuators
- Manual Valves
- Gear Operators
- Positioners

SPECIFICATIONS

Minimum Rotation Travel – Switches only: 5°

Maximum Rotation Travel – Switches only: 360°

Temperature Limits: -40 to 180°F (-40 to 82°C).

Switch Type: SPDT.

Electrical Rating:

QV-X1XXXX: 10A @ 125/250 VAC; 0.5A 125 VDC;
10A @ 24 VDC mech. switch.

QV-X2XXXX: 1A @ 125 VAC; 1A @ 24 VDC mech. switch.

QV-X3XXXX: 2A @ 125 VAC; 2A @ 30 VDC prox. switch.

QV-X4XXXX: 5-25 VDC NAMUR sensor.

QV-X5XXXX: 10-30 VDC INDUCTIVE sensor.

QV-X6XXXX: 10A @ 125/250 VAC mech. switch.

Lighting Supply Voltage: 24-28 VDC.

Enclosure Material: Polycarbonate housing and conduit.

Conduit Entrance: One 3/4" female NPT.

Enclosure Rating: NEMA 4, 4X. Optional explosion-proof, rated: Class I, Groups A, B, C, D; Class II, Groups F & G; Div. 2.

Maximum Altitude: 2000 m (6560 ft).

SUGGESTED SPECIFICATION

The position indicator shall be a Proximity model QV-XXXXXX QUICK-VIEW® valve position indicator. The (indicator) (switch) shall include: (0)(1)(2)(3)(4) switch element(s). The switch(es) shall (not be included) be SPDT (10 amp mechanical) (1 amp mechanical gold contacts) (2 amp proximity reed) (5-25 VDC NAMUR sensor) (10-30 VDC INDUCTIVE sensor). The mounting kit(s) will be (direct drive) (lever drive)(NAMUR). The lighting option is (not included) (28 VDC). The QV visual indicator is (not included) (standard) (upside down).

QUICK-VIEW® Valve Position Indicator/Switch

Ordering Information

QUICK-VIEW® COMPLETE MODEL CHART												
QV		MODEL NUMBER PREFIX										
		1ST CODE (1ST X) NUMBER OF SWITCHES										
		0	None*									
		1	One Switch*									
		2	Two Switches*									
		3	Three Switches*									
		4	Four Switches*									
		2nd Code (2nd X) Switch Type										
		0	No Switches*									
		1	10A Mechanical Snap Switch									
		2	0.1A Mechanical Gold Contacts									
		3	2A Proximity Reed Switch*									
		4	5-25 VDC Namur Sensor									
		5	10-30 VDC Inductive sensor									
		6	10A Mechanical Snap Switch									
			3rd Code (3rd X)									
			0									
			4th Code (4th X) Driving Style									
			1	Direct Drive*								
			2	Lever Drive*								
			3	Namur Drive*								
				5th Code (5th X) Lighting Option								
			0	None*								
			1	24 to 28 VDC Bright White LED's								
				6th Code (6th X) Visual Indication								
			0	None*								
			1	Standard (Open Closed)*								
			2	Upside Down (Open Closed)*								
				7th Code (7th X) Additional Options								
			EX	CLASS I, DIV. II, GROUPS A, B, C & D. CLASS II, DIV. II, GROUPS F & G.								
QV	2	1	0	1	0	1		– EXAMPLE POPULAR MODEL NUMBER				

⁺ EX, Explosion-proof option available.

NOTES:

1. Consult factory for optional visual indicator colors.
2. The 1st, 2nd, 3rd and 6th codes cannot all be zero.



Series
VPS

Valve Position Sensor

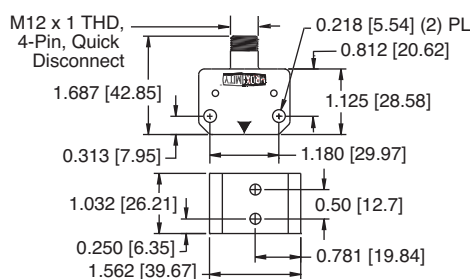
Dual Inductive, 2-Wire AC/DC Sensor, Fully Adjustable Target in 2° Increments



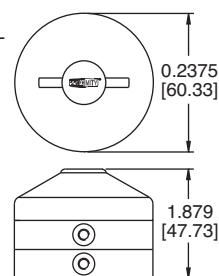
Model VPS2411



Model P1



Model VPS2411



Model P1

The dual inductive, 2-wire AC/DC Series VPS Valve Position Sensor maintains VDI/VDE 3845 dimensions so positioners can be easily mounted on top of the sensor and target. The Model VPS2411 Sensor and Model P1 Target mount easily and directly to actuators with ISO NAMUR topworks (see picture below). Fully adjustable target in 2° increments, the sensor has two independent LED's and bright Flow Line indicator that provide local visual indication. All electrical connections are made with the Model VIP82 4-pin quick disconnect cable (6 ft. in length) for ease in installation. Solid state components are fully embedded in an epoxy resin to prevent condensation build-up and to protect against vibration and shock. The rugged PBTP housing provides excellent corrosion resistance and moisture protection.

SPECIFICATIONS

Temperature Limits: -13 to 176°F (-25 to 80°C).

Power Requirements: 20-140 VAC (50/60 Hz), 10-200 VDC.

Switch Type: Dual normally open.

Electrical Rating: 200 mA.

Minimum Load Current: 5 mA.

Leakage Current: 0.8 mA.

Voltage Drop: 5.0 V.

Repeatability: 0.01 mm.

Hysteresis: 3-15% of sensing range.

Switching Frequency: 25 Hz.

Housing Material: Polybutylene Terephthalate.

Mounting Holes: NAMUR Mounting - 3.15" x 1.18" (80 x 30 mm) or 5.118" x 1.18" (130 x 30 mm).

Electrical Connection: 4-pin quick disconnect.



Model VPS and P1 mounted on an actuator with a positioner mounted on top.

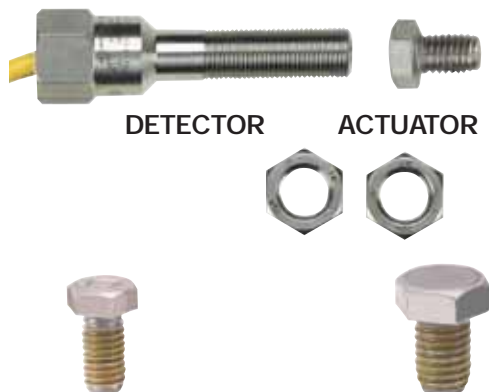
Model VPS2411 Valve Position Sensor

Model P1 Valve Position Target

Model VIP82 Quick Disconnect Cable

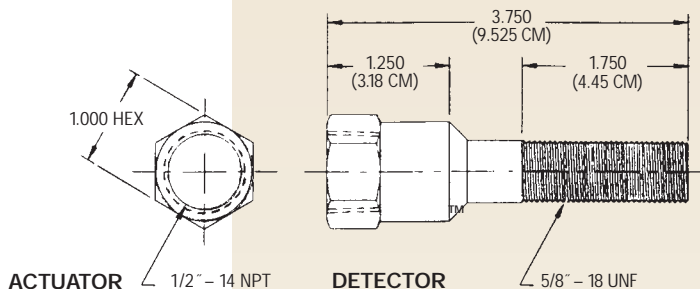
Detector Position Sensor

Reliable Magnetic Point Sensor, Stainless Steel Housing, AC or DC



Standard Actuator with DT1060
(3/8-16 UNC X 3/4")

High Strength Actuator with DT1160
(1/2-13 UNC X 3/4")



The Series DT Detector Position Sensors are reliable, magnetically actuated, stainless steel, completely interchangeable with competitive units. AC or DC for user friendly operation. They have no moving parts, eliminate costly seal fittings and offer enhanced reliability by eliminating arcing. Unintentional actuation by metals is not a problem. The sensor consists of a durable hermetically sealed reed switch potted in a stainless steel housing and a separate 316 SS magnetic actuator bolt. As the actuator moves within the sensing range of the sensor, the magnet in the actuator changes the state of reed switch contacts inside the sensor. This either opens or closes a circuit depending on wiring configuration. Sensing distance is 0.1" (2.54 mm) for the standard actuator. Greater sensitivity of a larger magnetic actuator increases the sensing distance to 0.5" (12.7 mm).

The Detector is excellent for hazardous and corrosive environments, solid state and intrinsically safe applications. A Detector may be mounted in any position. For installation in hazardous locations be sure to check local and national electrical codes. The Detector is designed to NEMA 1, 3, 4, 4X, 6, 7, 9, 12 and 13.

APPLICATIONS

The Detector is used for control element position monitoring and indication with devices such as Linear Valves - Actuators & Cylinders - Rotary Valves - Dampers.

Model No.	Description	Sensing Distance
DT1060	Detector and standard actuator	0.1" (2.54 mm)
DT1160	Detector and high strength actuator	0.5" (12.7 mm)

SPECIFICATIONS

Temperature Limits: -40 to 163°F (-40 to 73°C).

Switch Type: Tungsten, SPDT, Form C.

Electrical Rating: 3A @ 125 VAC, 3A @ 30 VDC.

Enclosure Rating: Weatherproof; Hermetically Sealed; Explosion-proof UL & CSA Listed for Class I, Groups A, B, C, & D; Class II, Groups E, F & G. Divisions 1 & 2.

Intrinsically Safe: Simple Apparatus (w/barrier).

Operating/Response Time: 3.0 m Sec.

Initial Contact Resistance: 0.50 ohms (Max).

Repeatability: 0.005 in. (.01 cm).

Hysteresis: 0.030 in. (.08 cm).

Electrical Connection: Factory sealed leads with 18" (45 cm) minimum, 4 conductor, PVC insulated, 18 AWG - Green/Red/Black/White (Ground/NC/ NO/Common).

Housing: 316 SS.

Potting: Epoxy Resin.

Conduit: 1/2"-14" female NPT.

Weight: 0.32 lb (145 g); 0.45 lb (204 g) with actuator.

SUGGESTED SPECIFICATION

Position sensor shall be magnetically operated Proximity Detector model (DT1060) (DT1160). Sensing distance shall be (0.1") (0.5"). The sensor shall be SPDT, Form C, hermetically sealed and rated 3 amps 125 VAC, 3 amps 30 VDC, and shall include a stainless steel actuator with internal magnet. The 316 SS housing shall be designed to NEMA 4, 4X, 7, 9, UL & CSA certified Class I, Groups A,B, C & D; Class II, Groups E, F, & G, Divs. 1 & 2 requirements and have a 1/2" NPT conduit entrance.

PROXIMITY[®]

 Series
PS

Proximity Sensors

Capacitive or Inductive 3-Wire DC, Threaded Body

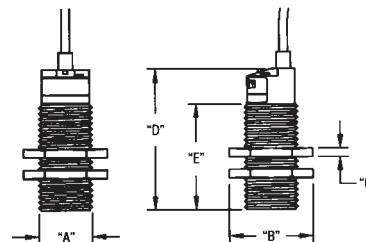


PSC Series



PSI Series

Dim.	PSC20103	PSC20203	PSI2002203	PSI2005303
A	M18	M30	M12	M18
B	1.065 (27)	1.614 (41)	0.688 (17)	0.938 (17)
C	0.157 (4)	0.197 (5)	0.125 (3)	0.125 (3)
D	3.156 (80)	3.156 (80)	2.36 (60)	2.87 (73)
E	2.36 (60)	2.36 (60)	1.58 (40)	1.97 (50)



The Series PS Proximity Sensors are noninvasive sensors ideal for level detection, position indicating and counting applications. Capacitive type sensors detect electrically conducting and nonconducting materials, liquids, solids, or powders and include a sensitivity adjustment to differentiate between various materials. Inductive sensors detect ferrous or nonferrous metals only. A bright LED indicates the state of the output switch. Sensors feature short circuit, reverse polarity, and transient protection. Small size and threaded body make installation easy. Inductive sensors are embeddable (can be mounted flush). Capacitive sensors are environmentally protected to IP65 and Inductive sensors are protected to IP68. Units include two fixing, screwdriver, and operating manual.

Model Number	Type	Body Size	Switching Frequency	Detecting Dist. in (mm)
PSC20103	Cap.	M18 x 1	400 Hz	.04-3 (1-10)
PSC20203	Cap.	M30 x 1.5	250 Hz	.08-79 (2-20)
PSC30203*	Cap.	M30 x 1.5	250 Hz	.08-79 (2-20)
PSI2002203	Ind.	M12 x 1	800 Hz	.08 (2)
PSI2005303	Ind.	M18 x 1	500 Hz	.19 (5)

*PNP Transistor

SPECIFICATIONS

Wetted Materials: Glass GRP Crastine reinforced plastic (PSC), Stainless Steel (PSI) (Model PSI2002203), Nickel-plated Brass (Model PSI2005303).

Temperature Limits: -22 to 212°F (-30 to 100°C) capacitive, -13 to 158°F (-25 to 70°C) inductive.

Enclosure Rating: PSC, IP65; PSI, IP68.

Repeatability: ±0.05% (Model PSC20103), ±0.1% (Model PSC20203), ±0.01% (PSI Models).

Power Requirements: 8 to 30 VDC.

Switch Type: Normally open NPN transistor, sinking (PSC30203:PNP).

Electrical Rating: 250 mA (PSC), 200 mA (PSI).

Minimum Load Current: 8 mA (PSC), <25 mA (PSI).

Leakage (Off-State) Current: <3 mA (PSC), <0.08 mA (PSI).

Voltage Drop: <3.5V @ 250 mA (PSC), <2.5V @ 200 mA (PSI).

Ripple: 10%.

Electrical Connection: 9.8 ft (3 m) cable.

Deadband: 20% of range (PSC), 15% of range (PSI).

Initializing Time Delay: <10 msec.

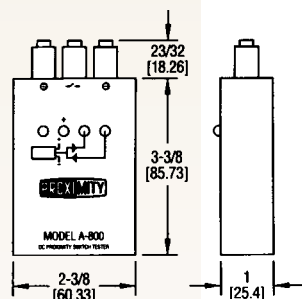
Agency Approvals: CE.

PROXIMITY[®]

 Model
A-800

Proximity Switch Tester

For 2, 3 or 4 Wire DC Switches



Quickly check the operation of DC proximity sensors or level switches without dismounting. Designed to test any two-, three- or four-wire sensor with a solid state switch output. The A-800 provides visual and audible indication of whether the switch is operational. Switch status (NPN/PNP) indication is designated by a yellow LED. Power "on" is indicated by a bright green LED, "low battery" is indicated by a red LED. Unit can be used with capacitive, inductive, or photo electric sensors. The pocket sized A-800 is supplied with two 9 volt batteries.

SPECIFICATIONS

Voltage Supply: 18 VDC.

Batteries: Two 9 volt (included).

Connections: Three spring loaded terminals.

Housing Material: ABS plastic.

Weight: 0.77 lb (350 g).

Agency Approvals: CE.

Model No. A-800 DC Proximity Switch Tester

Hazardous Locations Listings

Class I (-4)	Flammable gases or vapors are or may be present in sufficient quantities to produce explosive or ignitable mixtures.
Division I (-4A)	Gases or vapors are or may be in the atmosphere in normal operations.
Group A (-2)	Containing acetylene.
Group B (-2)	Containing hydrogen, ethylene oxide & propylene oxide or gases or vapors of equivalent hazard.
Group C (-2)	Containing ethyl-ether vapor, ethylene or cyclopropane.
Group D (-2)	Containing gasoline, hexane, naphtha, benzine, butane, propane, alcohol, acetone, lacquer solvent or natural gas.
Division II (-4B)	Gases or vapors are not normally present. They may be present due to leakage, accidents or maintenance. It is possible for one atmosphere to contain the same items as listed for Groups of Division I of this class.
Class II (-5)	Combustible dust may be present in sufficient quantities to produce an explosive atmosphere.
Division I (-5A)	Dust in suspension. Dust is or may be present in the atmosphere due to normal operating conditions.
Group E (-2)	Containing metal dust, including aluminum, magnesiums and their commercial alloys, and other metals of similar hazardous characteristics.
Group F (-2)	Containing carbon black, coal or coke dust.
Group G (-2)	Containing flour, starch or grain dust.
Division II (-5D)	Dust not normally in suspension. Possibly containing the same items as listed for Groups of Division I of this class.
Class III (-6)	Ignitable fibers are present, but not necessarily present in air in quantities sufficient to produce ignitable mixtures.
Division I (-6A)	Easily ignitable fibers or materials producing combustible flyings are handled, manufactured or used.
Division II (-6B)	Easily ignitable fibers are stored or handled.

NEMA Standards for Industrial Enclosures

Type 1	General purpose - indoor.
Type 2	Drip-proof - indoor. Protects against limited amounts of falling liquids and dirt.
Type 3	Dust-tight, raintight and sleet resistant - outdoor. Protects against windblown dust, rain sleet and external ice formation.
Type 3R	Same as Type 3, except not dust-tight.
Type 3S	Same as Type 3, but provides for operation of external mechanism when ice-laden.
Type 4	Watertight and dust-tight - indoor and outdoor. Protects against windblown dust and rain, splashing water and hose-directed water.
Type 4X	Same as Type 4 except also corrosion resistant.
Type 5	Dust-tight - indoor. Protects against dust and falling dirt.
Type 6	Submersible, watertight and dust-tight - indoor and outdoor. Protects against water entry during occasional temporary submersion to a limited depth.
Type 6P	Same as Type 6 except for prolonged submersion.
Type 7	Class I indoor hazardous locations. Explosion proof, may be A, B, C or D.
Type 8	Class I indoor or outdoor hazardous locations - oil immersed equipment, may be A, B, C or D.
Type 9	Class II indoor hazardous locations. Explosion proof, may be E, F or G.
Type 10	Mining Enforcement Safety Administration. Explosion proof in methane or natural gas.
Type 11	Corrosion resistant and drip-proof - oil-immersed - indoor .
Type 12	Dust-tight and drip-tight - indoor, non-corrosive dripping liquids.
Type 12K	Same as Type 12 except enclosures have knockouts.
Type 13	Oil-tight and dust-tight - indoors, non-corrosive spray of water, oil and coolant.



Hazardous Locations and Intrinsic Safety Basics

Intrinsic Safety Certification

Mark 1, 3, 4 switches/transmitters (all) are certified intrinsically safe (II 1 G ExiaIICT4), with any combination of “microswitches, external drive mechanism and other such information” (housing material), “that does not affect intrinsic safety.” Use of gold alloy contacts is recommended for level switch intrinsic safety applications.

There are three components to an intrinsically safe circuit: the field device, intrinsically safe barrier and field wiring. In practical applications, two conditions must be met to have an intrinsically safe circuit;

- 1.) An intrinsic safety barrier must be used to limit the current (with a resistor) and voltage (with a zener diode) in the intrinsically safe circuit loop thus limiting energy input, and
- 2.) The capacitance and inductance of wiring and components in the intrinsically safe circuit loop must be limited. Energy storage capability must be limited.

Field devices such as OPEN/CLOSED contacts, thermocouples, RTD's, LED's and resistors are passive (simple apparatus) with no capacitance or inductance. They do not need to be approved by a third party for use in intrinsically safe circuits. Because of low energy switching, we recommend the use of gold alloy or hermetically sealed contacts for intrinsic safety, such as the Proximity G, H, W, R, P, L or Q switches.

Complex field devices such as transmitters, solenoids, relays and transducers may store excess energy and thus need third party approval. The proper barrier can then be selected for these devices.

Flameproof/Explosion-proof Classifications

Mark 1, 3 - All Divisions, Classes and Groups; and International, all Zones.

- NEMA 1, 2, 3, 3R, 3S, 4, 4X, 6, 7, 9, 12, 13.
- II 2 G Ex d IIC T6, IP68.
- Ex d IIC T6, IP68 (15 meters)
- Submersible to 50' and applied to 200'.

Mark 4 - Class I, Groups C, D; Class II; Groups E, F, G; all divisions

- NEMA 1, 2, 3, 3R, 3S, 4, 4X, 6, 7, 9, 12, 13.
- II 2 G Ex d IIC T6, IP68
- Ex d IIC T6, IP68 (15 meters)