



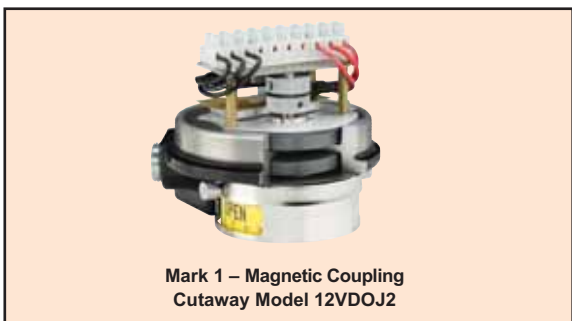
Mark Series

Position Indicators/ Switches/ Transmitters



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, transmitters and HART Communications. 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

- 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

- 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 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.

Valves



Mark Series

Position Indicators/ Switches/ Transmitters

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
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	
Switch Type & Rating		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
		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
Driving Method			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
			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, $\text{CE} \text{ II 2 G Ex d IIC T6 } (-25/-40/-50^{\circ}\text{C}^{\dagger\dagger} \leq \text{Tamb} \leq 70^{\circ}\text{C})$ (T5 (-25/-40/-50 $^{\circ}\text{C}^{\dagger\dagger} \leq \text{Tamb} \leq 80^{\circ}\text{C}$) optional wording).	A	A	A
			IS	Directive 94/9/EC, KEMA 03 ATEX 1392 x, $\text{CE} \text{ II 1 G Ex ia IIC T4}$.	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

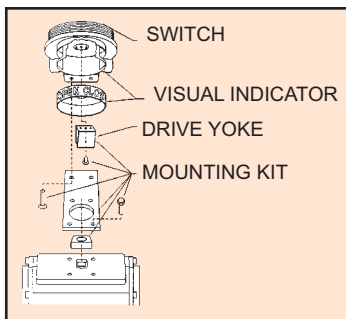
Mark 1, 2 Switches both Type V – SPDT, 4 to 20 mA transmitter, Direct Drive, Painted Aluminum Enclosure.





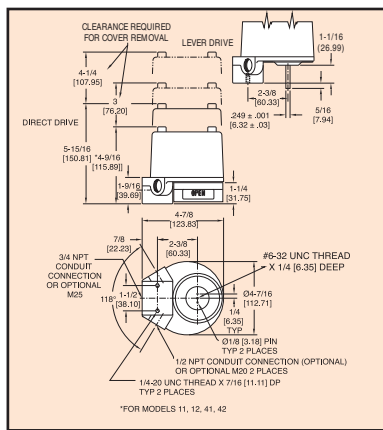
Mark Series

Position Indicator s/ Switches/ Tr ansmitter s



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** II 2 G Ex d IIC T6 for -25°C/-40°C/-50°C ≤ Tamb ≤ 70°C and T5 for (-25°C/-40°C/-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** 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.

Patents: US 4214133, 4647733, 4831350, 5357067, and other patents pending.

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 527.

Electrical Rating: See model chart on page 527.

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: ± 0.25% 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.