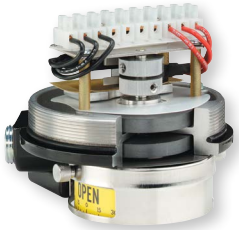
Dwyer

SERIES MARK | PROXIMITY BY DWYER

POSITION INDICATORS/SWITCHES/TRANSMITTERS

Mark 1
Polyester Coated Aluminum
(Environmentally sealed for corrosive areas)

Mark 1
Stainless Steel
(Environmentally sealed for corrosive areas)



Mark 1
Magnetic Coupling
Cutaway Model 12VDOJ2

Mark 3
Multi Turn

Mark 4
Thru-Shaft Cutaway
Model 42RDOJ2

Scan here to watch product video

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, HART® and WirelessHART® 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 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 more cost effective alternative to the Mark 1 for applications that are not as demanding.

MARK WITH WIRELESSHART® FEATURES/BENEFITS
- Available on Mark 1 and 4 model indicators
- WirelessHART® allows for adjustment of settings without needing to remove the device from a hazardous environment
- Wireless ability saves on installation costs associated with running conduit and wires

MARK 1 FEATURES/BENEFITS
- Features a magnetic coupling that isolates the switch compartment, completely sealing the unit from the surrounding atmosphere for maximum hazard and leak protection
- EZ set cams on switch models provide simple set point adjustment
- Flexible design allows multiple switches and transmitter options
- Ideal for corrosive environments

MARK 3 FEATURES/BENEFITS
- Features a 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 FEATURES/BENEFITS
- 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
- EZ set cams on switch models provide simple set point adjustment
- Flexible design allows multiple switches and transmitter options
- A more cost effective alternative to the Mark 1 Series for less demanding applications

Mark Series mounted to an actuator

MODEL CHART

Model	Function	Design	Model	Function	Design
12AD0	2 SPDT	Magnetic coupling	**42AD0**	2 SPDT	Thru-shaft drive
12AL0	2 SPDT (lever drive)	Magnetic coupling	**44AD0**	4 SPDT	Thru-shaft drive
14AD0	4 SPDT	Magnetic coupling	**45VD0**	2 SPDT & 4-20 mA position transmitter	Thru-shaft drive
15VD0	2 SPDT & 4-20 mA position transmitter	Magnetic coupling	**42VD0-J1**	2 SPDT	Thru-shaft drive
12AD1	2 SPDT	Magnetic coupling	**44VD0-J1**	4 SPDT	Thru-shaft drive
14AD1	4 SPDT	Magnetic coupling			
12VD0-J1	2 SPDT	Magnetic coupling			
14VD0-J1	4 SPDT	Magnetic coupling			

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.

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SERIES MARK | PROXIMITY BY DWYER

POSITION INDICATORS/SWITCHES/TRANSMITTERS

MODEL CHART

								Available Options "A" signifies available with corresponding construction style.		
								Mark		
								1	3	4
Construction	1						Mark 1, Magnetic Coupling			
	3						Mark 3, Multi-Turn			
	4						Mark 4, Thru-Shaft			
Output Type		1					1 Switch	A	--	A
		2					2 Switches	A	A	A
		3					1 kΩ Potentiometer 1/2%. Available with switches, see note below.*	A	A	A
		31					1 kΩ Potentiometer 1/4%. Available with switches, see note below.*	A	A	A
		32					2 kΩ Potentiometer. Available with switches, see note below.*	A	A	A
		35					5 kΩ Potentiometer. Available with switches, see note below.*	A	A	A
		310					10 kΩ Potentiometer. Available with switches, see note below.*	A	A	A
		320					20 kΩ Potentiometer. Available with switches, see note below.*	A	A	A
		4					4 Switches	A	A	A
		5					Transmitter 1 kΩ Potentiometer 1/2%. 4 to 20mA. Available with switches, see note below.*	A	A	A
		51					Transmitter 1 kΩ Potentiometer 1/4%. Available with switches, see note below.*	A	A	A
		52					Transmitter 2 kΩ Potentiometer. 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	A
		8					AS-interface and 2 Switches. Available with Switch Types B, I, R, W.	A	--	A
		9					Transmitter with HART® communication. Available with switches, see note below.*	A	--	A
		91					Transmitter with WirelessHART® communication. Not available with switches. (Contact factory)	A	--	A
Switch Type & Rating			A				SPDT Snap, Rated: 15 A @ 125/250/480 VAC (~) ; 1/8 hp @ 125 VAC (~), 1/4 hp @ 250 VAC (~), 1/2 A @ 125 VDC (⎓), 1/4 A @ 250 VDC (⎓).	A	A	A
			B				Inductive Sensor. 10 to 30 VDC (⎓). Load: 0.1 A.	A	--	A
			C				SPDT High Temperature Snap, 350°F (176°C) for 600 hours, Rated:15.1 A @ 125/250/277 VAC (~).	A	A	A
			D				DPDT Snap, Rated: 10 A @ 125/250 VAC (~), 0.3 A @ 125 VDC (⎓),0.15 A @ 250 VDC (⎓).	A	A	A
			G				SPDT Gold Contact Snap, Rated: 1 A @ 125 VAC (~).	A	A	A
			H				SPDT Hermetically Sealed Snap, Rated: 1 A @ 125 VAC (~).	A	--	A
			I				NAMUR Inductive Sensor. 15 mA max @ 5-25 VDC (⎓).	A	--	A
			M				SPDT Magnetic Blow-Out, Rated: 10 A @ 125 VAC (~)/VDC (⎓), 1/4 hp @ 125 VAC (~)/VDC (⎓).	A	A	A
			O				No Switches	A	A	A
			R				SPDT Hermetically Sealed Reed, Rated: 2 A @ 125 VAC (~), 2 A @ 24 VDC (⎓).	A	--	A
			S				SPDT Snap, Rated: 4 A @ 125/250 VAC (~).	A	--	A
			T				SPDT High Temperature Snap, 250°F (121°C) Continuous, Rated: 5 A @ 125/250/480 VAC (~).	A	A	A
			V				SPDT Snap, Rated: 10 A @ 125/250 VAC (~), 1/3 hp @ 125/250 VAC (~), 1/2 A @ 125 VDC (⎓), 1/4 A @ 250 VDC (⎓), 4 A @ 125 VAC (~) (tungsten).	A	A	A
			W				SPDT Gold Contact Snap, Rated 0.1 A @ 125 VAC (~).	A	A	A
Driving Method				A			A Direct or Yoke Drive without Visual Indicator.	A	A	A
				D			Direct Drive (or Yoke) with Visual Indicator.	A	A	A
				E			Direct or Yoke Drive with Visual Indicator, Single Window.	A	A	A
				L			Lever Drive (Shaft Projection) without Visual Indicator.	A	A	A
				M			Lever (Shaft Projection) with 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
					5		Aluminum, Painted (color not yet specified)	A	A	A
					6		Cast 316 Stainless Steel	A	A	A
					7 thru 20		Aluminum, Painted (color not yet specified)	A	A	A
Options						C1	Long Dwell Cam (not on Mark 3)	A	--	A
						C2	Double Cam (not on Mark 3)	A	--	A
						FKM	FKM Seals	A	A	A
						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
						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 X 1.5 (M20 X 1.5 for optional J1 and J2 connections).	A	A	A
						B	Any Output Type except 91: Directive 2014/34/EU, KEMA 03ATEX2391 X, CE 0518 Ex II 2G Ex db IIC T6 Gb (-25/-40/-50°C ≤ Tamb ≤ 70°C and T5 for -25°C/-40°C/-50°C ≤ Tamb ≤ 80°C). Depending on output switch type selected.	A	A	A
						B	Output Type 91: Directive 2014/34/EU, KEMA 03ATEX2391 X, CE 0518 Ex II 2G Ex db IIC T4 Gb (-40°C ≤ Tamb ≤ 80°C).	A	--	A
						IS	Any Output Type except 91: Directive 2014/34/EU, KEMA 03ATEX1392 X, CE 0518 Ex II 1G Ex ia IIC T4 Ga.	A	A	A
						IS	Output Type 91: Directive 2014/34/EU, KEMA 03ATEX1392 X, CE 0518 Ex II 1G Ex ia IIC T4 Ga for -40°C ≤ Tamb ≤ 80°C.	A	--	A
						IE	Any Output Type except 91:IECEx DEK 11.0056X Ex db IIC T6 Gb (-25/-40/-50°C ≤ Tamb ≤ 70°C and T5 for -25/-40/-50°C ≤ Tamb ≤ 80°C) optional wording depending on output and switch type selected. Output Type 91: IECEx DEK 11.0056X, Ex db IIC T4 Gb.	A	A	A
						IE	Any Output Type except 91: IECEx DEK 11.0061X Ex ia IIC T4 Ga.	A	--	A
						II	Output Type 91: IECEx DEK 11.0061X Ex ia IIC T4 Ga.	A	A	A
						II	Certificate NCC 13.02339X; Marking: Ex d IIC T6 Gb or Ex d IIC T5 Gb	A	A	A
						EM	Certificate: NCC 13.02338X; Marking: Ex ia IIC T4 Ga	A	A	A
						IM	Output Type 91 with Suffix B Directive 2014/34/EU, KEMA 03ATEX2391 X, CE 0518 Ex II 2G Ex db IIC	A	A	A
						LB	T4 Gb (-40°C ≤ Tamb ≤ 80°C). Battery not included.	A	--	A
						LB	Output Type 91 with Suffix IS Directive 2014/34/EU, KEMA 03ATEX1392 X, CE 0518 Ex II 2G Ex ia IIC T4 Ga for -40°C ≤ Tamb ≤ 80°C. Battery not included.	A	--	A
						LB	Output Type 91 with Suffix IE IECEx DEK 11.0056X, Ex db IIC T4 Gb. Battery not included.	A	--	A
						LB	Output Type 91 with Suffix II IECEx DEK 11.0061X Ex ia IIC T4 Ga. Battery not included.	A	--	A
						PP	Plug J1, J2 Ports	A	A	A
						PT	Paper Tag	A	A	A
						STR	Stainless Steel Tag Riveted	A	A	A
						STW	Stainless Steel Tag Wired	A	A	A

***Note:** 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. WirelessHART® not available with switches.

Example: 12VD0-J1
Mark 1, 2 Switches both Type V – SPDT, Direct Drive, Painted Aluminum Enclosure with Junction Package.
Example: 15VD0
Mark 1, 2 Switches both Type V – SPDT, 4 to 20 mA transmitter, Direct Drive, Painted Aluminum Enclosure.

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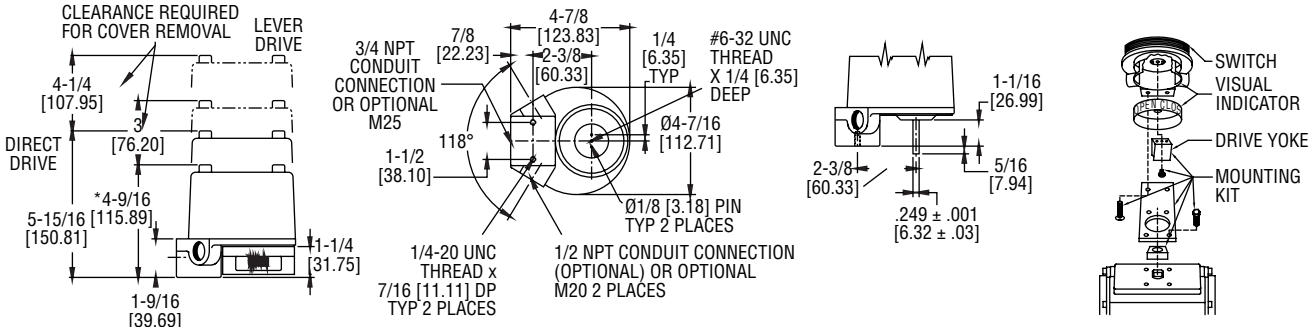
POSITION INDICATORS/SWITCHES/TRANSMITTERS



For Models 11, 12, 41 & 42

SPECIFICATIONS

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 and IECEx flameproof, -IE suffix, rated -40 to 176°F (-40 to 80°C) for switch types A, G, M, O, R, S, T, V, or W, -13 to 176°F (-25 to 80°C) for switch types B, D, or I.; ATEX intrinsically safe, -IS suffix and IECEx intrinsically safe, -II suffix, rated -13 to 104°F (-25 to 40°C) for switch type I, -40 to 104°F (-40 to 40°C) for switch types O, R, S, V, or W.
Power Rating: 1.5 Watt maximum.
Output Signal: 1000 Ω standard. Optional 2000, 5000, 10000, or 20000 Ω.
Zero and Span Adjustments: Span trim pot with 2000Ω 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 and IECEx flameproof, -IE suffix, rated -40 to 176°F (-40 to 80°C) for switch types A, G, M, O, R, S, T, V, or W, -13 to 176°F (-25 to 80°C) for switch types B, D, or I.; ATEX intrinsically safe, -IS suffix and IECEx intrinsically safe, -II suffix, rated -13 to 104°F (-25 to 40°C) for switch type I, -40 to 104°F (-40 to 40°C) 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 X 1.5 and M20 X 1.5 optional.
Rotational Travel: Mark 1 and 4: Minimum: 50°, Maximum: 300°. Mark 3: Minimum: 1.5 revolutions, Maximum: 8.5 revolutions.

Mark 1 and 4 Transmitter with HART® communication
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 and IECEx flameproof, -IE suffix, rated -40 to 176°F (-40 to 80°C) for switch types A, G, M, O, R, S, V or W, -13 to 176°F (-25 to 80°C) for switch types B, D or I; ATEX intrinsically safe, -IS suffix and IECEx intrinsically safe, -II suffix, rated -40 to 104°F (-40 to 40°C) for switch types O, R, S, V or W; -13 to 104°F (-25 to 40°C) for switch type 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® communication 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 X 1.5 and M20 X 1.5 optional.
Rotational Travel: Mark 1 and 4: Maximum: 330°.

Mark 1 and 4 Transmitter with WirelessHART® communication
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 and IECEx flameproof, -IE suffix: rated -40 to 176°F (-40 to 80°C). ATEX intrinsically safe, -IS suffix and IECEx intrinsically safe, -II suffix: rated -40 to 176°F (-40 to 80°C).
Power Requirements: 8 to 30 VDC.
Current Consumption: 50 mA max.
Power Output: +10 dBm (10 mW).
Operating Frequency: 2400 to 2483.5 MHz.
Operating Channels: 15.
Sensitivity: -85dB.
Zero and Span Adjustments: Pushbuttons or WirelessHART® communication master for setting both. Span is adjustable from -160 to 160°.
Conduit Connection: Two 1/2″ female NPT, M20 X 1.5 optional.
Rotational Travel: Mark 1 and 4: Maximum: 320°.

SPECIFICATIONS

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 15 meters (IP68); It is up to the end user to source the proper fittings to ensure a watertight seal.

ATEX Compliant:
-B suffix, any Output Type except 91: Directive 2014/34/EU, KEMA 03ATEX2391 X, CE 0518 Ex II 2G Ex db IIC T6 Gb 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. Compliant per EN 60079-0:2012+A11:2013 and EN 60079-1:2014.
-B suffix, Output Type 91, with or without -LB suffix: Directive 2014/34/EU, KEMA 03ATEX2391 X, CE 0518 Ex II 2G Ex db IIC T4 Gb for -40°C ≤ Tamb ≤ 80°C . Compliant per EN 60079-0:2012 + A11:2013, EN 60079-1:2014 and EN 60079-11:2012.

-IS suffix, any Output Type except 91: Directive 2014/34/EU, KEMA 03ATEX1392 X, CE 0518 Ex II 1G Ex ia IIC T4 Ga. Compliant per EN 60079-0:2012 + A11: 2013 and EN 60079-11:2012.
-IS suffix, Output Type 91, with or without -LB suffix: Directive 2014/34/EU, KEMA 03ATEX1392 X, CE 0518 Ex II 2G Ex ia IIC T4 Ga. Compliant per EN 60079-0:2012+A11:2013 and EN 60079-11:2012.

IECEx Compliant:
-IE suffix, any Output Type except 91:IECEx DEK 11.0056X Ex db IIC T6 Gb 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. Compliant per IEC 60079-0:2011 and IEC 60079-1:2014.

-IE suffix, Output Type 91, with or without -LB suffix: IECEx DEK 11.0056X, Ex db IIC T4 Gb for -40° ≤ Tamb ≤ 80°C. Compliant per IEC 60079-0:2011, IEC 60079-1:2014 and IEC 60079-11: 2011.

-II suffix, any Output Type except 91: IECEx DEK 11.0061X Ex ia IIC T4 Ga. Compliant per IEC 60079-0:2011, IEC 60079-11:2011, and IEC 60079-26:2014.

-II suffix, Output Type 91, with or without -LB suffix: DEK 11.0061X Ex ia IIC T4 Ga. Compliant per IEC 60079-0:2014, and IEC 60079-11:2011.

INMETRO Compliant:
IM suffix, Certificate: NCC 13.02338 X; Marking: Ex ia IIC T4 Ga
EM suffix, Certifcate: NCC 13.02339 X; Marking: Ex d IIC T6 Gb or Ex d IIC T5 Gb

Electrical Connections: Screw terminal. Optional factory sealed leads that are 36″ (914.4 mm) of 16 AWG.
Conduit Connection: Standard: one 3/4″ female NPT; optional one to two 1/2″ female NPT; WirelessHART® models: two 1/2″ female NPT; Optional: M25 X 1.5 or M20 X 1.5 connections may be supplied in lieu of 3/4″ and 1/2″ female NPT for all models.
Mounting Orientation: Not position sensitive.
Weight: 4 to 6 lb (1.5 to 3.0 kg).
Operational Life: Over 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 and IECEx flameproof, -IE suffix, rated -58 to 176°F (-50 to 80°C) for switch type A, G, H, T, or M, -40 to 176°F (40 to 80°C) for switch type O, R, S, V, or W, -13 to 176°F (-25 to 80°C) for switch type B, D, I, or AS Interface; ATEX intrinsically safe, -IS suffix and IECEx intrinsically safe, -II suffix, rated -13 to 104°F (-25 to 40°C) for switch type D or I, -40 to 104°F (-40 to 40°C) for switch type R, V, or W, or -58 to 104°F (-50 to 40°C) for switch type A, G, or H.).
Switch Type: See page reference ❶ below.
Electrical Rating: See page reference ❷ below.
Set Point Adjustment: Mark 1 and 4: 5 to 360°.

❶Switch Type: See page 413 (Series Mark)
❷Electrical Rating: See page 413 (Series Mark)