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Bulletin No. PROX-J
Drawing No. LP0019
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MODEL PSAC - 3-WIRE INDUCTIVE PROXIMITY SENSOR WITH CURRENT SINK OUTPUT

- *SENSE FERROUS AND NON-FERROUS METAL OBJECTS*
- *OPERATES FROM ZERO TO 5 KHZ PULSE OUTPUT RATE*
- *SENSES TARGETS AS SMALL AS 12 D.P. GEAR TEETH*
- *IDEAL FOR TACHOMETER, COUNTER AND CONTROL INPUT*

DESCRIPTION

The PSAC offers a NPN Open Collector output that is compatible with most Red Lion Controls' Motion Monitors, Counters, and Controls. This sensor has a maximum sensing distance of 0.059" (1.5 mm) and can detect ferrous and non-ferrous metal targets from zero speed to 5 KHz.

The 0.25" diameter pole piece is epoxy encapsulated in a stainless steel case measuring 0.75" Dia. x 3.5" L and is supplied with a 10, 25 or 50 ft., 3-wire, cable. Overall dimensions, including the neoprene strain-relief boot are 0.90" Dia. x 4.5" L. Operating temperature range is -25 ° to +70 °C.
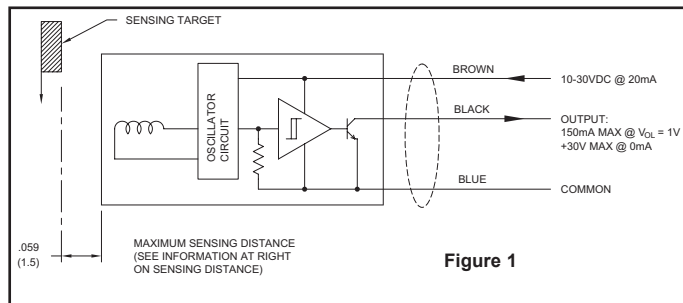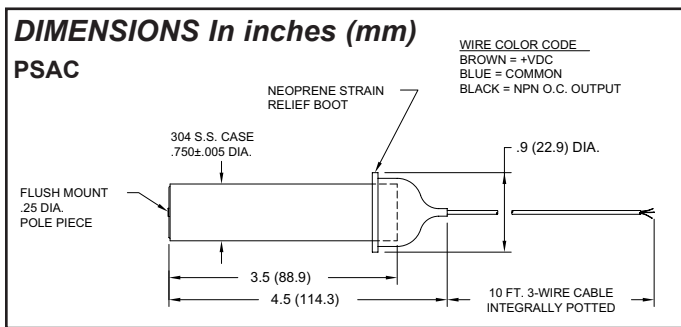
SPECIFICATIONS

1. **SUPPLY VOLTAGE:** +10 - 30 VDC @ 20 mA max.; **Unit is not Reverse Polarity Protected.**
2. **MAXIMUM SWITCHING FREQUENCY:** 5 KHz
3. **OUTPUT:** NPN Open Collector Transistor;
   V_{OH} = 30 VDC max.; V_{OL} = 1 V max @ 150 mA.
4. **MAXIMUM SENSING DISTANCE:** 0.059" (1.5 mm)
5. **OUTPUT CABLE:** Integrally potted 10, 25, or 50 feet ± 6 inches; PUR jacketed 3-wire 24 AWG conductors.
   BROWN = +VDC, **BLUE** = Common, **BLACK** = NPN O.C. Output
6. **OPERATING TEMPERATURE RANGE:** -25 °C to +70 °C (-13 °F to +158 °F)
7. **CONSTRUCTION:** Epoxy Encapsulated 0.25" dia. sensor in 0.750" ±0.005" dia. #304 stainless steel case.

DIMENSIONS In inches (mm)

PSAC

WIRE COLOR CODE
BROWN = +VDC
BLUE = COMMON
BLACK = NPN O.C. OUTPUT

NEOPRENE STRAIN
RELIEF BOOT

304 S.S. CASE
.750±.005 DIA.

.9 (22.9) DIA.

FLUSH MOUNT
.25 DIA.
POLE PIECE

3.5 (88.9)

4.5 (114.3)

10 FT. 3-WIRE CABLE
INTEGRALLY POTTED

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
PSAC	NPN O.C. Proximity Sensor, 10 ft. Cable	PSAC0000
	NPN O.C. Proximity Sensor, 25 ft. Cable	PSAC0025
	NPN O.C. Proximity Sensor, 50 ft. Cable	PSAC0050
	Block Mount for 3/4" Cylindrical Sensors	5400100
	Steel Plug Mount	5403701
	Stainless Steel Plug Mount	5403702

Do not dispose of unit in trash - Recycle

PSAC APPLICATION

PSAC application depends on the size, material, and spacing of the targets being sensed and the sensing distance that can be maintained. The maximum sensing distance is defined as that distance where the sensor is just close enough to detect a ferrous target whose diameter is equal to or greater than the sensor diameter. For the PSAC, the internally potted sensor diameter is 0.25". In an actual application the sensing distance should be between 50-70% of the maximum to assure reliable detection. For target sizes smaller than the 0.25" sensor diameter, the maximum sensing distance can be estimated from the curve in Fig. 2. A further reduction factor must also be applied if the target material is a non-ferrous metal as shown in Fig. 3.

Ideally, spacing between adjacent targets should be at least 0.25" so that the first target completely leaves the sensors' viewing field before the next target appears. Individual targets can still be resolved as separate objects if this spacing is reduced to 70 or 75% of the sensor diameter, however this can introduce a minimum limit on sensing distance that makes adjustment a bit more critical

The PSAC is internally shielded which allows the sensor face to be flush mounted in metal applications without reducing sensing distance.
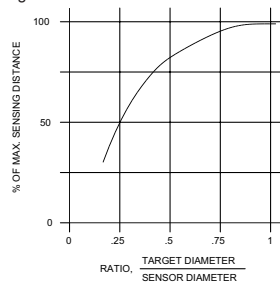
SENSING TARGET

BROWN — 10-30VDC @ 20mA

OSCILLATOR CIRCUIT

BLACK — OUTPUT:
150mA MAX @ V_{OL} = 1V
+30V MAX @ 0mA

BLUE — COMMON

.059
(1.5)

MAXIMUM SENSING DISTANCE
(SEE INFORMATION AT RIGHT
ON SENSING DISTANCE)

Figure 1

MAXIMUM SENSING DISTANCE REDUCTION FACTORS

Reduction in the max. sensing distance due to decrease in diameter of ferrous targets.

% OF MAX. SENSING DISTANCE

100

50

0

0   .25   .5   .75   1

RATIO, $\frac{\text{TARGET DIAMETER}}{\text{SENSOR DIAMETER}}$

Figure 2

Typical reduction factors for various nonferrous targets with diameters equal to or greater than sensor diameter.

MATERIAL	% SENSING DISTANCE
MILD STEEL	100%
STAINLESS STEEL	APPROX. 75%
ALUMINUM	APPROX. 40%
BRASS	APPROX. 35%
COPPER	APPROX. 30%

Figure 3
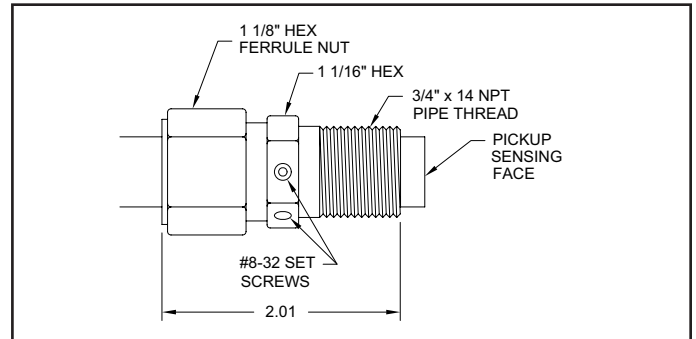
3/4" DIAMETER CYLINDRICAL SENSOR MOUNTING

BLOCK MOUNT

The PSAC and other Red Lion Controls 3/4" diameter cylindrical pickups may be easily mounted using Model 5400100 **BLOCK MOUNT** *(see diagram below)*. This machined block of solid aluminum provides for rigid mounting using the two included #8-32 x 1/2" screws. The one screw split-clamp design allows for easy adjustment of airgap and locks the unit securely without deforming the case.
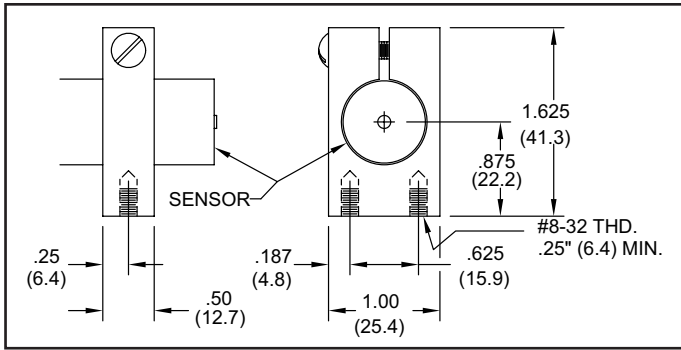
PLUG MOUNT

The **PLUG MOUNT** *(see diagram below)* allows 3/4" dia. cylindrical sensors to be mounted in "thru-wall" applications. The Plug Mounts 3/4-14 NPT thread is installed into a threaded wall or casing. The sensor is then installed through the plug mount. The sensor-to-target airgap is adjusted and the sensor is tightened into position by two #8-32 set screws. Tightening the ferrule nut compresses a teflon ferrule around the sensor providing an oil tight seal. Plug Mounts are available in both steel and stainless steel *(see ordering information)*.

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