

MODEL PSAC - 3-WIRE INDUCTIVE PROXIMITY SENSOR WITH CURRENT SINK OUTPUT



DESCRIPTION

The PSAC contains a sensing coil, oscillator, and Schmidt trigger pulse-shaper with an 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, shielded cable. Overall dimensions, including the neoprene strain-relief boot are 0.90" Dia. x 4.5" L. The NPN O.C. output has internal current limiting at 40 mA. Operating temperature range is -18° to +60°C.

SPECIFICATIONS

- SUPPLY VOLTAGE:** +12 VDC @ 20 mA max.; Reverse Polarity Protected.
- MAXIMUM SWITCHING FREQUENCY:** 5 KHz
- OUTPUT:** NPN Open Collector Transistor;
V_{OH} = 30 VDC max.; V_{OL} = 1 V max @ 40 mA.
Output current is limited to 40 mA.
- MAXIMUM SENSING DISTANCE:** 0.059" (1.5 mm)
- OUTPUT CABLE:** Integrally potted 10 ft. PVC jacketed 3-wire 22 AWG conductors with stranded shield and 100% foil shield coverage.
RED = +VDC, **BLK** = Common, **WHT** = NPN O.C. Output
- OPERATING TEMPERATURE RANGE:** -18°C to +60°C (0°F to +140°F)
- CONSTRUCTION:** Epoxy Encapsulated 0.25" dia. sensor in 0.750" ±0.005" dia. #304 stainless steel case.

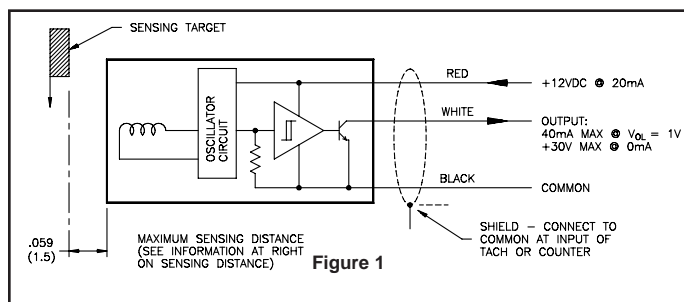
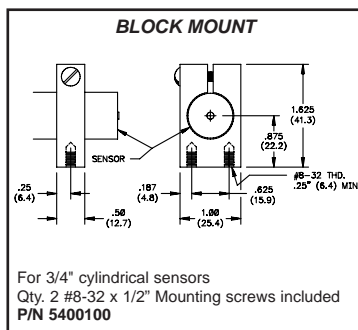


Figure 1

3/4" DIAMETER CYLINDRICAL SENSOR MOUNTING

The PSAC and other Red Lion Controls 3/4" dia. cylindrical pickups may be easily mounted using Model 5400100 **BLOCK MOUNT** (see diagram at right). This machined block of solid aluminum provides for rigid mounting using the 2 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. Alternative plug mounts available. See Model LMP for details.



- 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

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.

MAXIMUM SENSING DISTANCE REDUCTION FACTORS

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

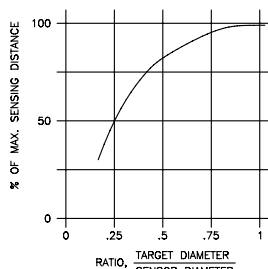


Figure 2

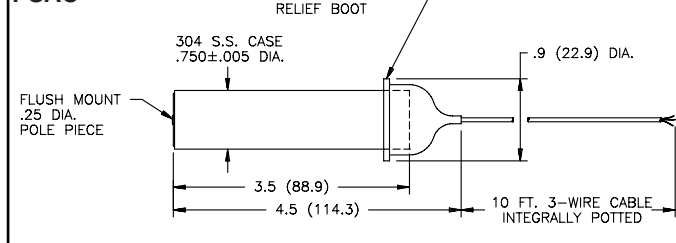
Typical reduction factors for various nonferrous targets with diameters equal to or greater than sensor diameter.

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

Figure 3

DIMENSIONS [In inches (mm)]

PSAC



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	5400100

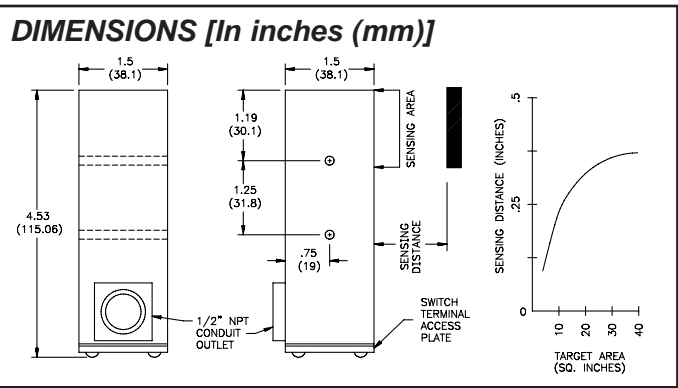
MAGNETIC PROXIMITY SWITCH - RESPONDS TO FERROUS METALS &
REQUIRES NO EXTERNAL POWER & RUGGED, FOR HOSTILE ENVIRONMENTS



DESCRIPTIONS

This sensor is ideal for generating switch-contact count signals from passing steel or iron castings, weldments, stampings, "Tin-cans", pulley spokes, etc. A flux-field, generated by internal permanent magnets is arranged to hold the SPDT switch contact in the N.C. position. When an external mass of magnetic material (target) approaches the sensing area, it shunts away a part of this field, causing the switch contact to transfer to the N.O. position. The distance, at which this occurs, is called the "Sensing Distance" and it depends on the size, shape and thickness of the ferrous target. The curve below shows variation of sensing distance with target area of steel plate, 0.1" or more in thickness. For very thin sheet steel (0.01" to 0.02") derate sensing distance by 50%. Once the N.O. switch transfer is made, the target must move away approximately 2 times the sensing distance to re-establish the original N.C. contact closure.

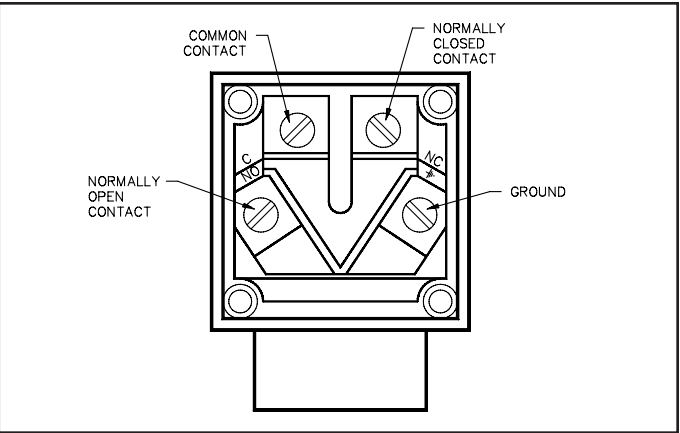
These switches can be operated at speeds up to 60 counts/sec and have a life rating of 2-billion operations when used in low-current, low-voltage electronic counting applications. Operating temperature range is -50° to +120°C.



SPECIFICATIONS

- 1. *SWITCH CONTACT RATING: 1250 watts max.; 120, 240, 480, 600 VAC; 10 cps resistive load.
- 2. RESPONSE TIME: 8 msec.
- 3. REPEATABILITY: 0.002" Typical
- 4. LIFE: Tested to mechanical and electrical life of over 2 billion cycles. (Actual life varies with electrical load.)
- 5. OPERATING TEMPERATURE RANGE: -50°C to +120°C (-60°F to +250°F)
- 6. APPROVALS: UL, CSA, FM

* - Derate at higher cycle rates, inductive loads and for DC uses.



ORDERING INFORMATION

Table with 3 columns: MODEL NO., DESCRIPTION, PART NUMBER. Row 1: MPS, Magnetic Proximity Switch, 4100600. A note below states: 'Note: The MPS is also available in an explosion-proof version, U/L, CSA & Factory Mutual Approved, on a special order basis. Contact your distributor for prices and delivery.'