hubbell industrial controls, inc.

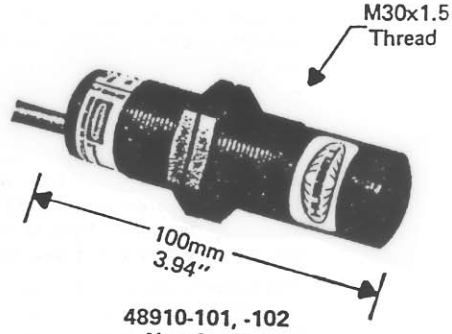
INSTRUCTIONS
2310
April 1987
NEW
REVISED 4/90

Bulletin 2310
Non-Contact Speed Responsive Switch Instructions

General

The 2310 non-contact speed responsive switch is a self-contained solid-state device capable of sensing the presence of metal without physical contact. This high density tubular package senses metal targets in a nominal 10mm (0.4") sensing distance from the sensing head for targets of a typical size, 30mm (1.20") square by 1.5mm (0.06") thick.

Operating principle of this AC load powered switch is the change in amplitude of an internal oscillator signal with the presence of the metal target within the oscillator's magnetic field. A moving metal target will result in an internal "static contact" closure when the target speed is greater than the selected setpoint range.



48910-101, -102
Non-Contact
Speed Responsive Switch

Specifications

Electrical Data.

Operating Voltage	102v. — 132v.
Line Frequency	50 — 60hz
On-state voltage drop	5.5 volts
Off-stage leakage current	10 ma.
Maximum load current	300 ma.
Minimum load current	20 ma.
Maximum inrush current (20 msec)	2 amp.
Output Circuit Configuration	N.O. triac switch
Temperature Range	-20° C to +70° C

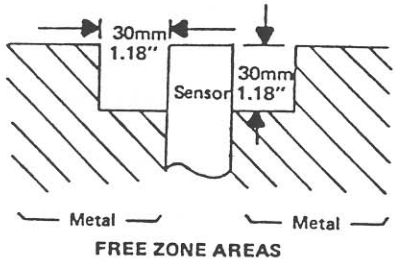
Mechanical Data.

Size	Length	100mm
	Diameter	30mm
	Thread	m30 x 1.5
Weight	Plastic	.22 Kg
	Sleeved	.30 Kg
Mounting		Observe Free Zone
	Requirements	See Fig. 1

Enclosure

Plastic Housing
Assembly 101, 102
Glass Filled Polyester (PBT)
UV Stabilized for outdoor use.
Nickel-Plated Sleeved Housing
Assembly 151, 152
Brass Sleeve over Glass Filled Polyester (PBT)
UV Stabilized for outdoor use.
NEMA 4X, 13

CSA-LR12268



FREE ZONE AREAS
Figure 1.

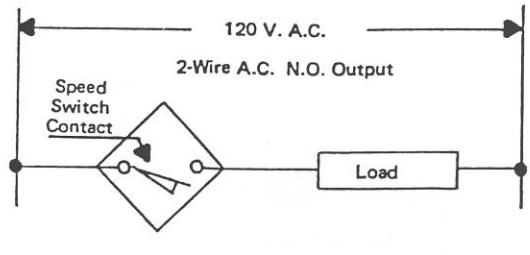
Operating Characteristics

Load Connection	Series load actuation See Fig. 2
Start-up Time	0.6 seconds
Speed Range, Assemblies 101, 151	6-150 RPM (single event)
Assemblies 102, 152	150-3600 RPM (single ever
Sensing Distance	12mm Maximum
Sensing Hysteresis (Distance)	2mm
Operating Hysteresis (Speed)	5%
Sensing Tolerance (Dependent upon target material)	
Temperature (-20° C to +70° C)	
Voltage	± 10%
Operating Tolerance (Speed)	± 10%

Four Speed Sensors are available as described above:
Low Speed Plastic Housing — 2310-LSP (Part No. 48910-101)
High Speed Plastic Housing — 2310-HSP (Part No. 48910-102)
Low Speed Nickle Plated Sleeve — 2310-LSNP (Part No. 48910-151)
High Speed Nickle Plated Sleeve — 2310-HSNP (Part No. 48910-152)

Low speed sensors are designed to operate in speed ranges 6-150 RPM (single event).
High speed sensors are designed to operate in speed ranges 150-3600 RPM (single event).

To sense slower speeds than those listed, multiple events should be detected in each revolution.



CONNECTION DIAGRAM
Figure 2.

Application Information

The 2310 non-contact speed responsive switch is a two-wire series load activating motion sensor operating on the inductive proximity switch principle. The speed switch is available in two speed ranges:

2310-LSP, 2310-LSNP – 6-150RPM (Single Event)

2310-HSP, 2310-HSNP – 150-3600RPM (Single Event)

As indicated above, the listed speed ranges are based on a single event or actuation per revolution. A typical application would involve sensing the key in a slotted motor or gear box shaft.

In order to sense slower speeds outside the listed ranges, multiple events or actuations per revolution must be used. An example of multiple event actuation might be the sensing of protruding bolt heads from a shaft coupling. If the coupling provides six bolt heads, the speed ranges would be divided by six with the slowest sensed speed being 1 RPM for the 101 assembly.

Select a mounting area keeping the free zone requirements, Fig. 1, in mind. The target must move laterally across the face of the speed switch.

Connect the speed switch per the wiring diagram shown in Fig. 2. Apply power to the speed switch circuit and set the target in motion. The red target LED on the rear of the speed switch should respond as the target passes by the front of the speed switch. See Fig. 5. If the red target LED does not respond, move the switch closer to the target. If the red LED is continuously on, move the switch farther away from the target. The operating range will be determined by the end points explained above. The ideal location of the speed switch is mid-way in this operating range.

The speed setting within a given sensor's range is adjustable with the 20 turn RPM adjustment potentiometer located behind the access screw. See Fig. 5. The initial setting of this potentiometer is made by first turning the potentiometer 20 turns counterclockwise, then turning the potentiometer clockwise by the number of turns indicated by the speed setting graphs, Fig. 3 and Fig. 4. For most applications, the initial settings (clockwise turns) obtained from the graph will provide adequate accuracy. If greater setting precision is required, monitor the target revolutions with a hand tachometer.

The yellow output LED, Fig. 5, will light when the sensed speed is above the speed setting. The yellow output light also signals that the output triac is on and that the series connected load is actuated.

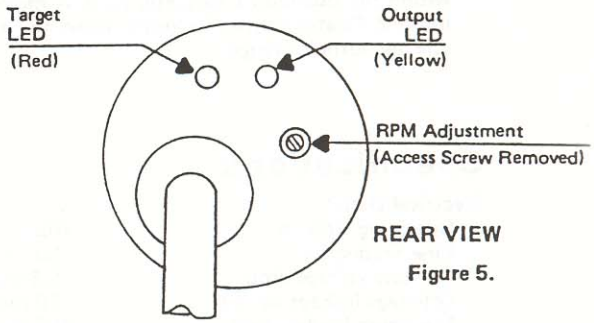


Figure 5.

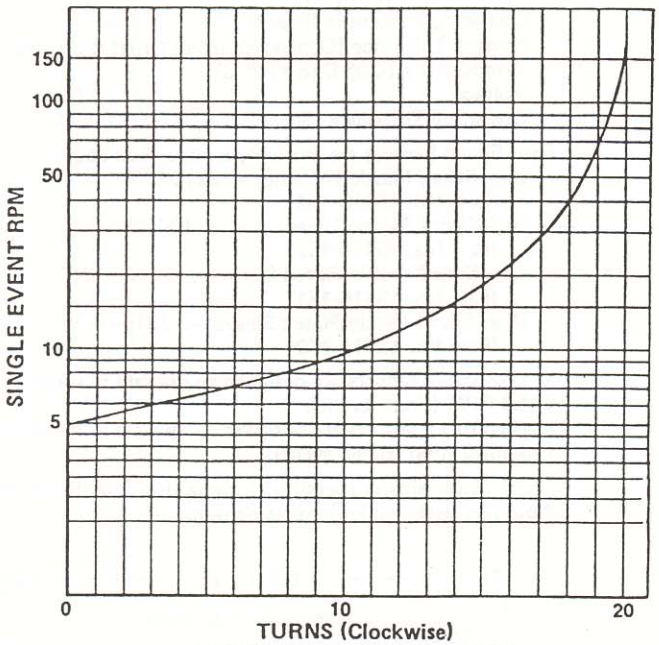


Figure 3.

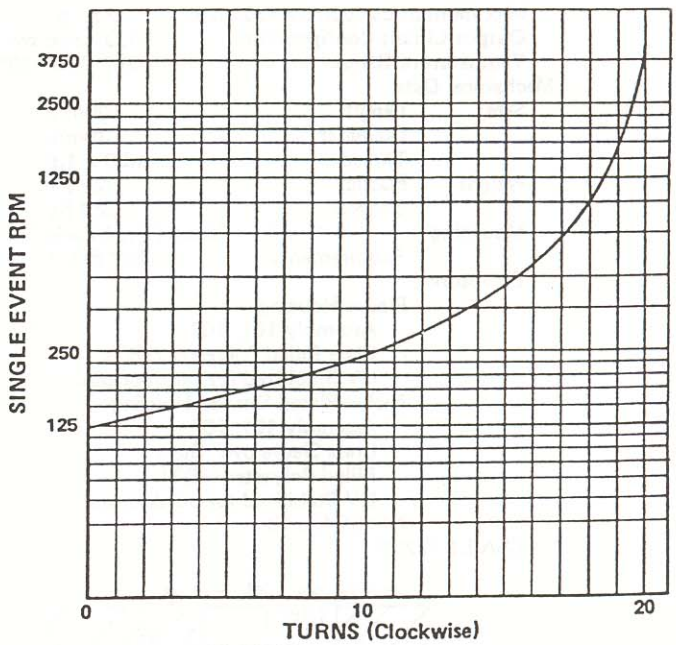


Figure 4.

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