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INTRODUCTION:

Zero speed switch is suitable for detecting the absence or presence of motion of rotating, reciprocating or conveying equipment. Thus, it's a speed limit switch that gives an indication when the system is at rest. A suitable motion detector probe is provided depending on the application.

TECHNICAL SPECIFICATIONS:

Mains:	110/230V AC (-10 to +10%) 50 Hz (as specified while ordering)
Power consumption:	
Cable entries:	2 nos.
Output:	one relay with a set of potential free c.o. contact rated at 6A, 230V AC, 50Hz for non-inductive load
Operating temp:	-20 to +60 deg C
Housing:	cast aluminium weatherproof, stoving enamel painted
Dimensions:	
Interlock:	by potential free N.O. contact of contactor controlling the motor of the monitored equipment
Indication:	red LED for alarm (relay de-energized), green LED for normal (relay energized) and yellow LED for pulse detection
Startup time delay:	3 sec to 20 sec
Zero speed time:	3 ppm to 20 ppm

PRINCIPLE OF OPERATION:

When power is initially applied to the zero speed switch, the alarm relay is energized and held by the timing circuit for desired (settable) time duration. Whenever the motion detector sensor detects a target, a signal in the form of pulse retriggers an internal timing circuit. This action keeps the alarm relay energized providing a fail-safe operation of the contacts. If no target is sensed for desired time duration (that is settable), the timing circuit will not be retriggered. This will cause the alarm relay to de-energize and the contacts to change state. Thus the relay output contact can be used for signaling/controlling.

SYSTEM DESCRIPTION:

The system comprises of a suitable motion detector probe and electronic circuitry for detecting zero speed. For details of motion detector probe refer to the appendix. The circuit consists of a step down transformer, a rectifier, a filter and a DC regulated power supply. It consists of a delay circuit that provides starting time delay and a retriggerable timing circuit, which compares the time between two pulses with a fixed time duration. The sensor circuit senses the moving target and outputs pulses, whose frequency is proportional to the speed of moving target. Adequate cable entries are provided for wiring.

INSTALLATION:

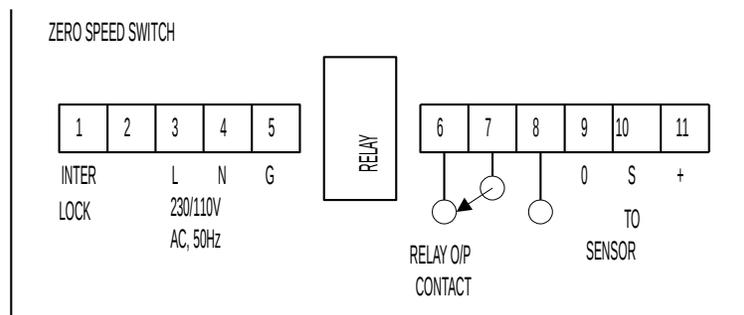
Refer to the appendix for mounting details.

WIRING:

After the installation proceed with the wiring. Refer to the connection diagram given below. Locate the PCB mounted terminals for making connections. Terminals 3, 4, and 5 are provided for connection to the mains. Line (L), Neutral (N) and Ground (G) should be connected to terminals 3, 4 and 5 respectively. Suitable cable glands have been provided for running the cables in and out.

CAUTION: Connecting 230 V mains to units configured for 110 V AC can cause permanent damage.

Connect relay output contacts as per desired operation for annunciation or control as the case may be. Ensure that the connected load voltage and current do not exceed the specified value given in the technical data. The relay output contacts are potential free and so any desired source can be connected in series with them as long as the specifications are not exceeded. Terminals 6, 7 & 8 are provided for zero speed relay. There is a provision for interlocking with the controlled equipment. Terminals 1 & 2 are provided for this purpose. These terminals are normally shorted by a link when shipped. In case interlock facility is to be used, the link should be removed and normally open contacts (potential free) of the contactor of the controlled device should be connected to terminals 1 & 2. Terminals 9, 10 & 11 are provided for connecting to the electronic insert in case of remote mounted probe. In case of integral mounting, these terminals are not provided. For trouble free operation, sensor cable should be routed separately from power cable. Care should be taken to prevent electromagnetic interferences. If long cables are needed, it is recommended to use shielded and earthed cables.

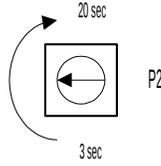


WIRING DIAGRAM

STARTING TIME DELAY SETTING:

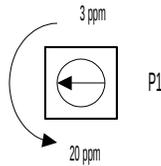
Starting time delay can be set from 3 seconds to 20 seconds, with the help of pot P2. Refer to the figure. For location of P2 refer to the diagram given on the next page. Let the starting time delay be set to t seconds. Now, initially when the instrument is switched on the relay will be energized for t seconds irrespective of the frequency of input pulses.

After t seconds, the relay will remain energized or will de-energize depending on the frequency of input pulses and the set value of zero speed.



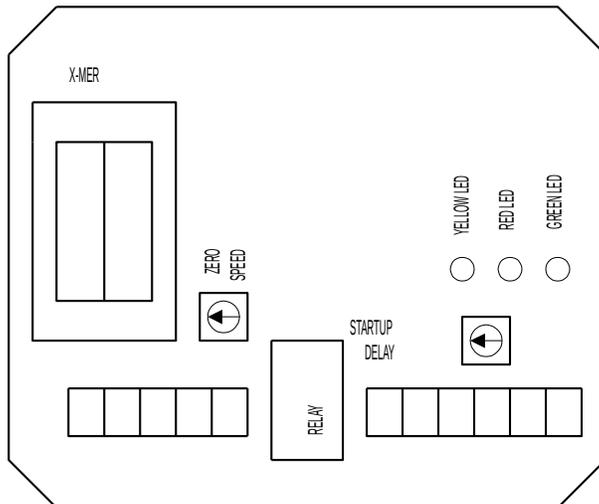
ZERO SPEED SETTING:

Zero speed can be set from 3 ppm (pulses per min.) to 20 ppm, with the help of pot P1 as shown in the figure. Note that 3 ppm setting means that if no pulse is received for 20 seconds then the relay will de-energize and red LED will glow indicating zero speed alarm. Similarly for 20ppm, alarm will be given if no pulse is received for 3 seconds. For location of P1 refer to the diagram given below.



INDICATORS:

Yellow LED indicates the receipt of input pulses. It flashes at a rate proportional to the frequency of input pulses. Red LED indicates alarm. It glows when the relay is de-energized. During alarm state green LED is off. Green LED indicates normal condition when relay is energized. During this time red LED is off. For location of LEDs refer to the diagram given below.



PCB showing location of POTs and LEDs