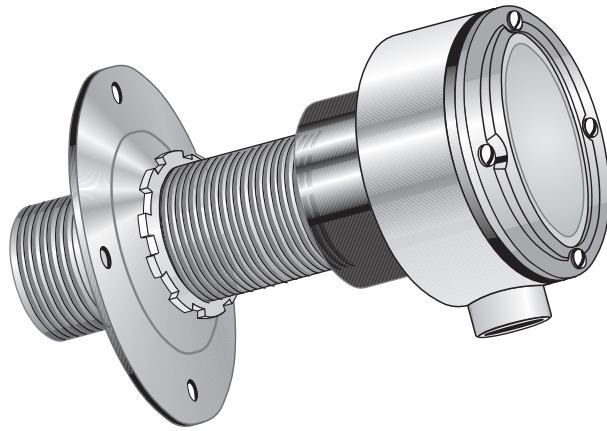


**MILLTRONICS**

# ZERO SPEED SWITCH

Instruction Manual PL-363

April 2001



ZERO SPEED SWITCH

## Safety Guidelines

Warning notices must be observed to ensure personal safety as well as that of others, and to protect the product and the connected equipment. These warning notices are accompanied by a clarification of the level of caution to be observed.

## Qualified Personnel

This device/system may only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

**Warning:** This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.

**Note:** Always use product in accordance with specifications.

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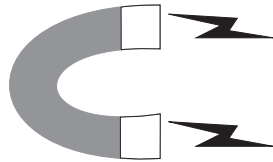
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## ABOUT THE ZERO SPEED SWITCH

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The Zero Speed Switch (ZSS) is used to detect the absence or presence of motion of rotating, reciprocating or conveying equipment. It consists of a circuit card and magnet assembly potted in the probe body. The ZSS is powered from the line voltage and provides a set of dry relay contacts for indication of motion. The probe must be aimed at a ferromagnetic material or target on the equipment in order to sense motion.



**This probe is highly magnetic. Keep it away from magnetosensitive materials such as computer discs and audio or video tapes.**

## SPECIFICATIONS

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- Power:
- » 115 V / 50-60 Hz, 10 VA
  - » 230 V / 50-60 Hz, 10 VA
  - »  $\pm 10\%$  of rated voltage
- Output:
- » 1 form C (S.P.D.T.) dry relay contacts, rated 5 A at 250 V ac, fail-safe operation
  - » time delay :
    - » start up : 3 seconds  $\pm 1$  fixed
    - » zero speed : 5 seconds  $\pm 1$  (minimum speed 10 to 15 ppm)\*  
or 10 seconds  $\pm 2$  (minimum speed 5 to 7.5 ppm)\*
- Operating Temperature: » - 40 to 60 °C (- 40 to 140 °F)
- Dynamic Range:
- » minimum 6 or 12 pulses per minute\*
  - » maximum 2400 pulses per minute
- Shipping Weight: » 2 Kg (4.4 lb)
- Approvals: » CSA

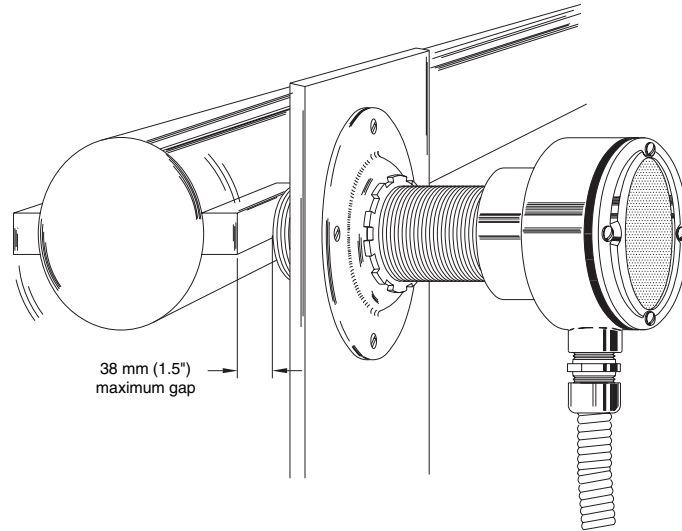
\* Selected via a common jumper. Refer to Operation.

## INSTALLATION

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The Zero Speed Switch must be mounted in an area that is non-hazardous, within the ambient temperature range and non-corrosive to the materials of construction. Refer to Zero Speed Switch Outline and Mounting for materials of construction.



The probe should be mounted using the supplied mounting flange, onto a vibration free structure. The gap between the probe and the target should be sufficient such that there is no danger of the target damaging the probe. The maximum allowable gap is 38 mm (1.5") from the face of the target to the face of the probe for target dimensions of 25 mm x 25 mm x 50 mm (1" x 1" x 2").

The Zero Speed Switch is sensitive to lateral disturbances to its magnetic field. If the Zero Speed Switch is responding to motion from an interfering target, move the Zero Speed Switch or install a ferrous plate (steel) as a shield between the Zero Speed Switch and the interfering target.

Where possible, the probe should be mounted such that the conduit entry is pointing downward to avoid accumulation of condensate in the casing. Connection of the probe should be made via flexible conduit for easier removal or adjustment of the probe.

**Do not mount the Zero Speed Switch in direct sunlight without the use of a sun shield.**

## OPERATION

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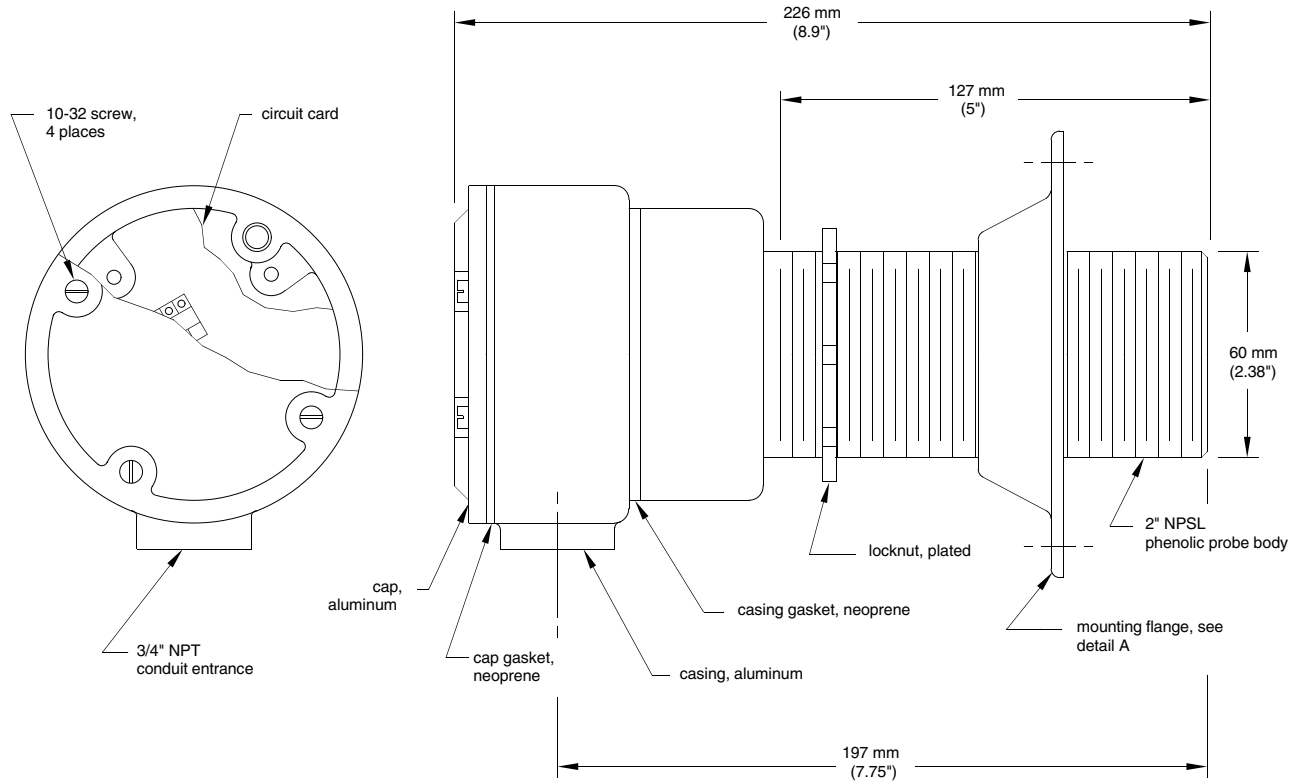
When power is initially applied to the Zero Speed Switch, the alarm relay is energized and held artificially by the timing circuit. This will simulate the normal operation of the ZSS for a start up delay of  $3 \pm 1$  seconds (or 5 seconds if a jumper is wired across terminal block 1 TB - 7/8).

As a ferromagnetic object passes through the probes permanent magnet field, the distortion of the flux is sensed by the magneto resistive sensor. The sensor modulates the current through it to produce a pulse which resets an internal timing circuit. This action keeps the alarm relay energized providing fail-safe operation of the contacts.

If no target or change in flux is sensed for a period of 10 seconds (or 5 seconds if a jumper is wired across terminal block 1TB-7/8), the timing circuit will not be reset. This will cause the alarm relay to de-energize and the contacts to change state.

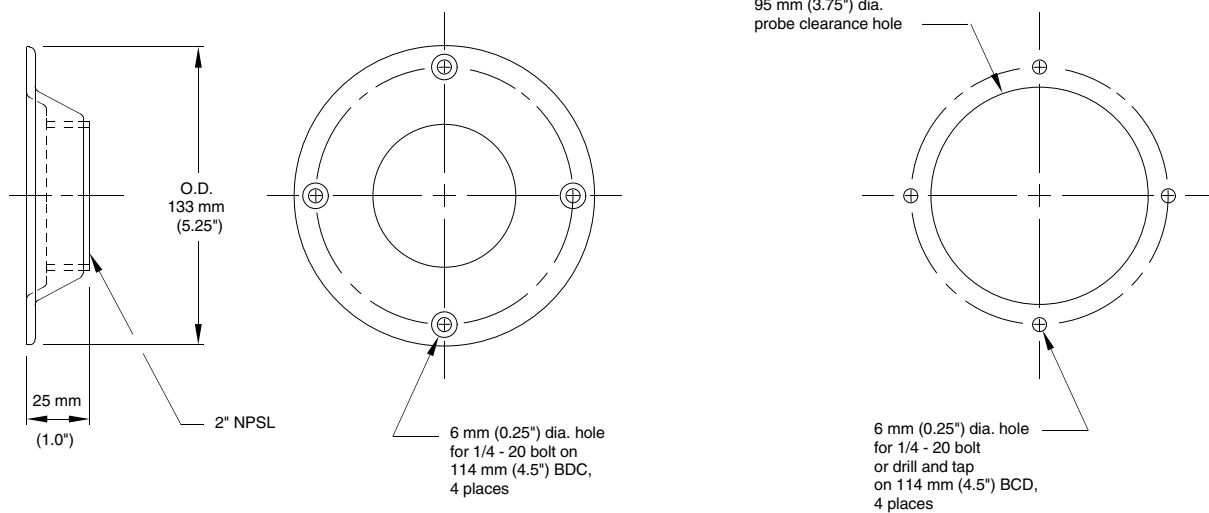
Thus the ZSS will not detect the motion of uniform ferromagnetic masses that do not produce pulses within the period of the time delay on zero speed.

# ZERO SPEED SWITCH OUTLINE AND MOUNTING

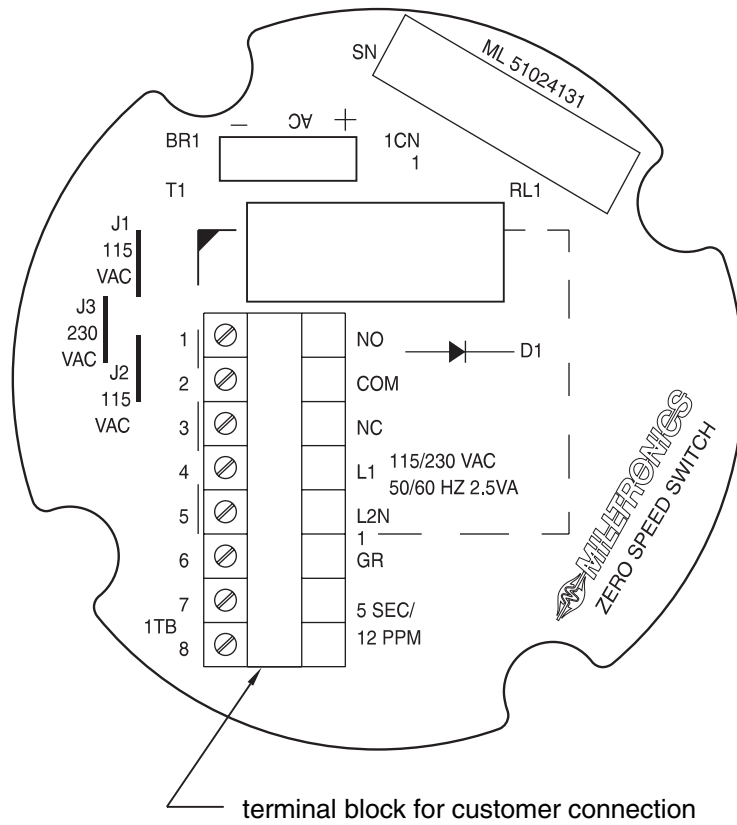


DETAIL A

MOUNTING



# ZERO SPEED SWITCH CIRCUIT CARD



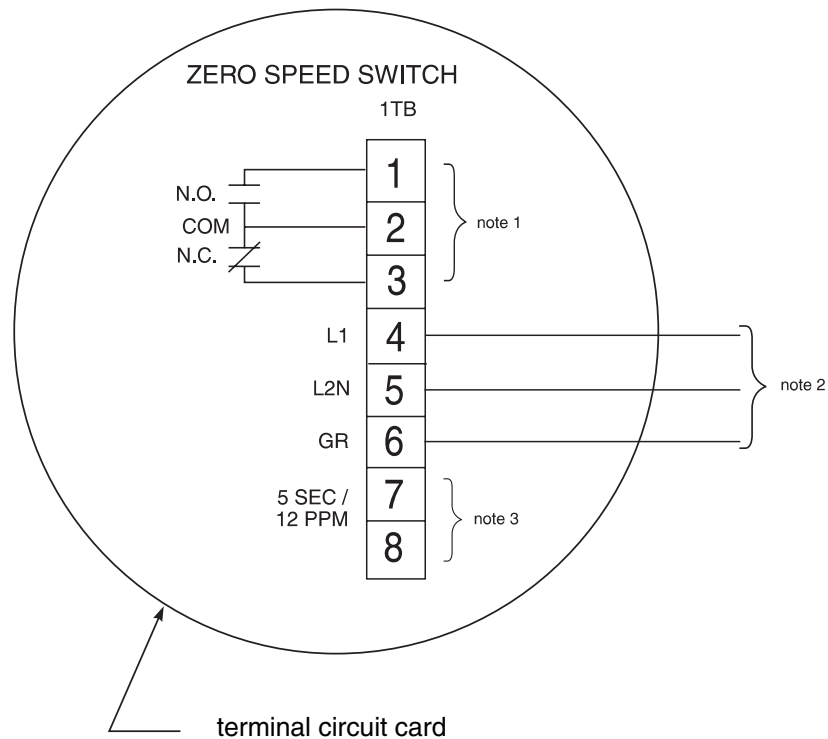
## NOTES :

For 115 V ac operation, jumpers J1 and J2 only are installed.

For 230 V ac operation, jumper J3 only is installed.

# ZERO SPEED SWITCH CONNECTION

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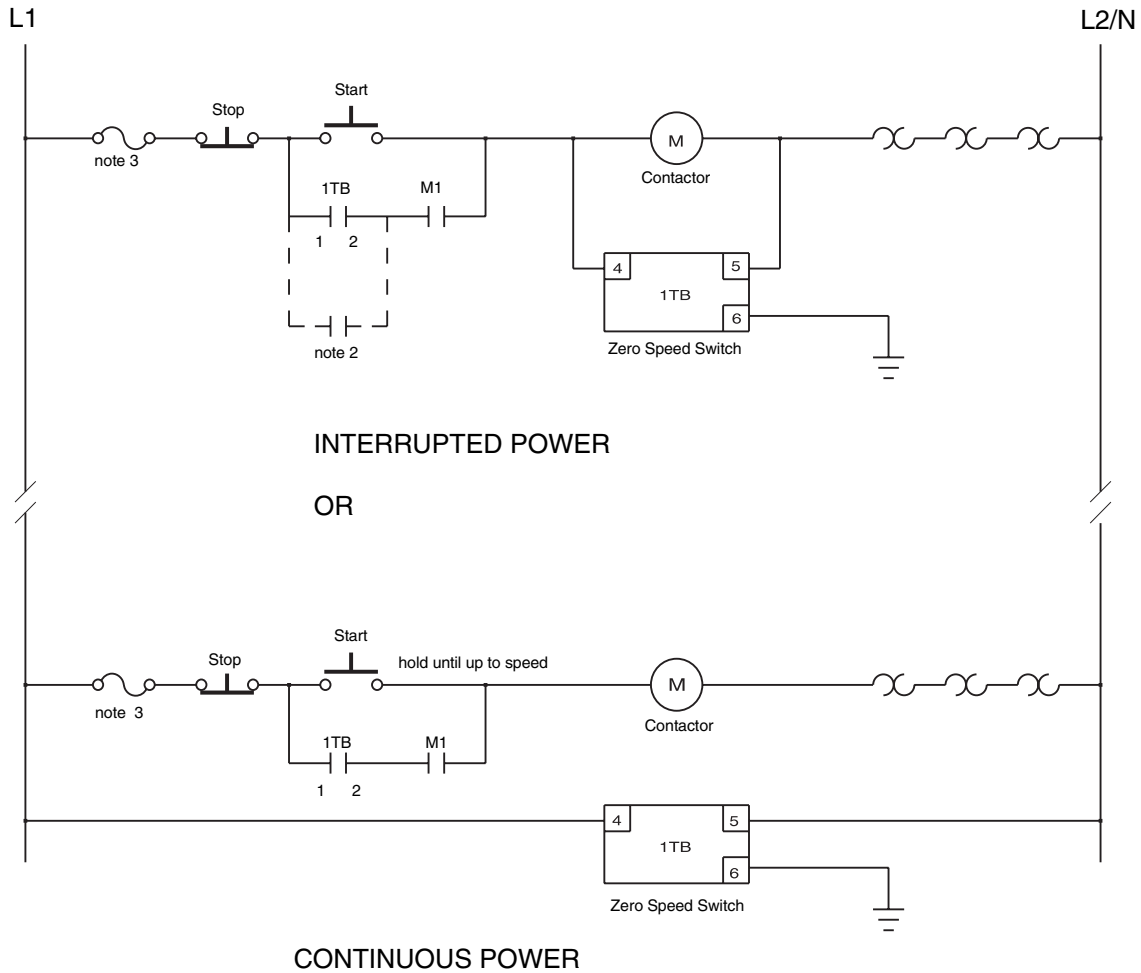


## NOTES :

1. Dry contacts shown in de-energized (alarm or shelf) state.
2. Zero Speed Switch is manufactured for 115 or 230 V ac operation. Correct voltage must be supplied. Voltages lower than specified will result in an inoperative condition. Vol higher than specified will severely damage unit.
3. For 5 second time delay and minimum 12 ppm range, connect jumper across 1TB-7/8.

# ZERO SPEED SWITCH TYPICAL WIRING

115/230 V ac 50/60 Hz



Should the time delay feature on start up not be required, power should be applied continuously from a separate source. Typically this would be desirable for automatic up-stream start up of conveying devices after down stream drive has reached its operation speed.

## NOTES :

1. Interlocks and safety pull switches are not shown.
2. If 'START' is initiated by programmable logic controller, closure time may be of insufficient duration to allow ZSS contact to latch. In such a case, program a timer contact into circuit.
3. CSA requires a 3 A or less fuse to protect contacts. For 240 V ac, protect contacts with a 1500 VA transformer as well.



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