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# MAXIGARD™



## A1500, A1500NF SPEED SWITCH

SINGLE SET POINT - SELF CONTAINED

### Introduction

The MAXIGARD A1500 and A1500NF are single adjustable set point speed switches designed to monitor the rotation of critical rotating shafts.

### Principle of Operation

The A1500 Series speed switches are supplied with a non-contacting sensor and magnetic target. The sensor signal is not impaired by build-up of dust or any other foreign material on the magnet disc or sensor. This switch is designed to detect under speed or over speed of a rotating shaft. The A1500 Series switch has one adjustable set point. The set point is designed fail-safe for under speed applications and in the event of a power failure the relay will de-energize and put the switch into an alarm condition.

### Components

THE A1500 SPEED SWITCH INCLUDES:

- 4" MAGNET DISC
- SELF-CONTAINED SENSOR
- CALIBRATION/ RELAY CIRCUIT
- SWITCH HOUSING/ MOUNTING BRACKET

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## SECTION 1 - MECHANICAL

### 1.0 Magnet Disc

- 1.1 The end of the shaft to be monitored should be square to prevent excessive disc wobble.
- 1.2 Center drill and tap the shaft end. (Suggested #21 drill and #10-32NF tap). Bolt the magnet disc to the end of the shaft. Use "Loc-tite" to keep the bolt and disc tight on the shaft.  
(see figure 1A, page 3).

### 2.0 Magnet Wrap (optional)

- 2.1 Separate the two halves of the magnet wrap by loosening the cap screws holding the two halves together.
- 2.2 Place both halves of the magnet wrap around the shaft. Re-insert and tighten the cap screws making sure the wrap is square to the shaft.  
(see figure 1B, page 3).

#### NOTE

There will be a slight gap between the two halves after tightening. This gap will not affect the generated signal.

### 3.0 Mounting the Speed Switch

- 3.1 Place the switch so the sensor is centered directly in front of the magnets on the disc or optional wrap.  
(see figure 1A & 1B, page 3).
- 3.2 The gap setting between the sensor and magnet disc should be approximately 1/8" - 7/8".

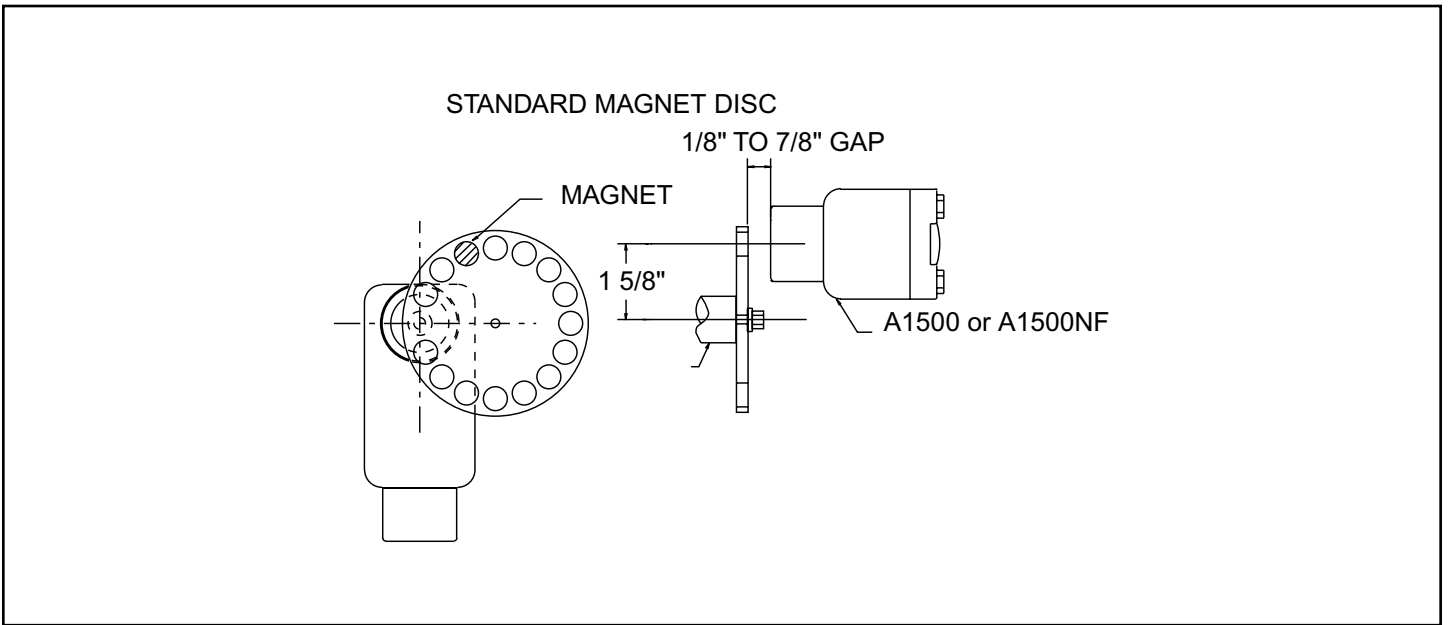


Figure 1A

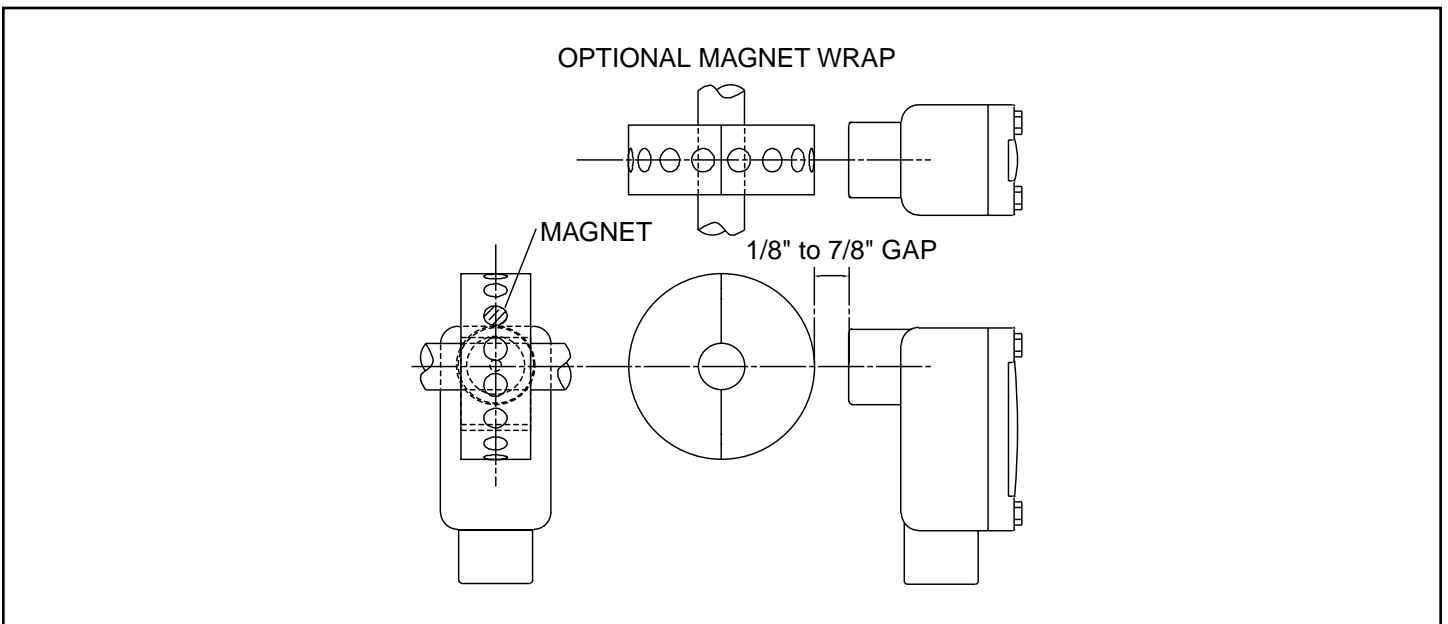


Figure 1B

#### 4.0 A1500 and A1500NF Speed Switch Housings

4.1 The A1500 switch housing is UL/CSA listed and certified for Class I, Div. 1 & 2, Group D, Class II Div. 1 & 2, Group E, F, & G, Class III. (see figure 2, page 4).

4.2 The A1500NF switch housing is rated NEMA 3 PVC. (see figure 2, page 4).

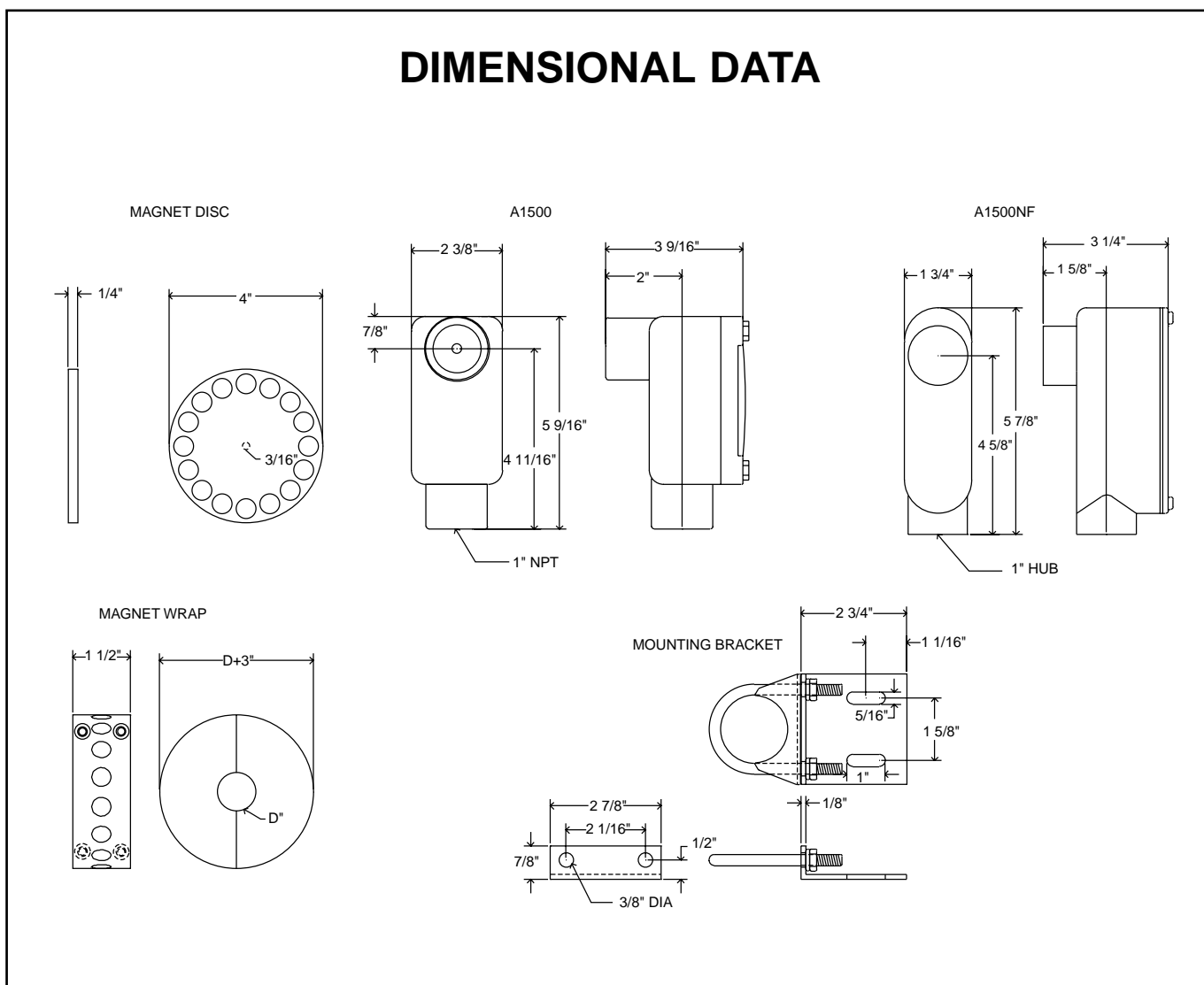


Figure 2

## SECTION 2 - FIELD WIRING

### 5.0 Wiring A1500 or A1500NF Speed Switch

- 5.1 Connect 120 VAC to L1 (red) and L2 (white, neutral).  
(see figure 3, page 5).

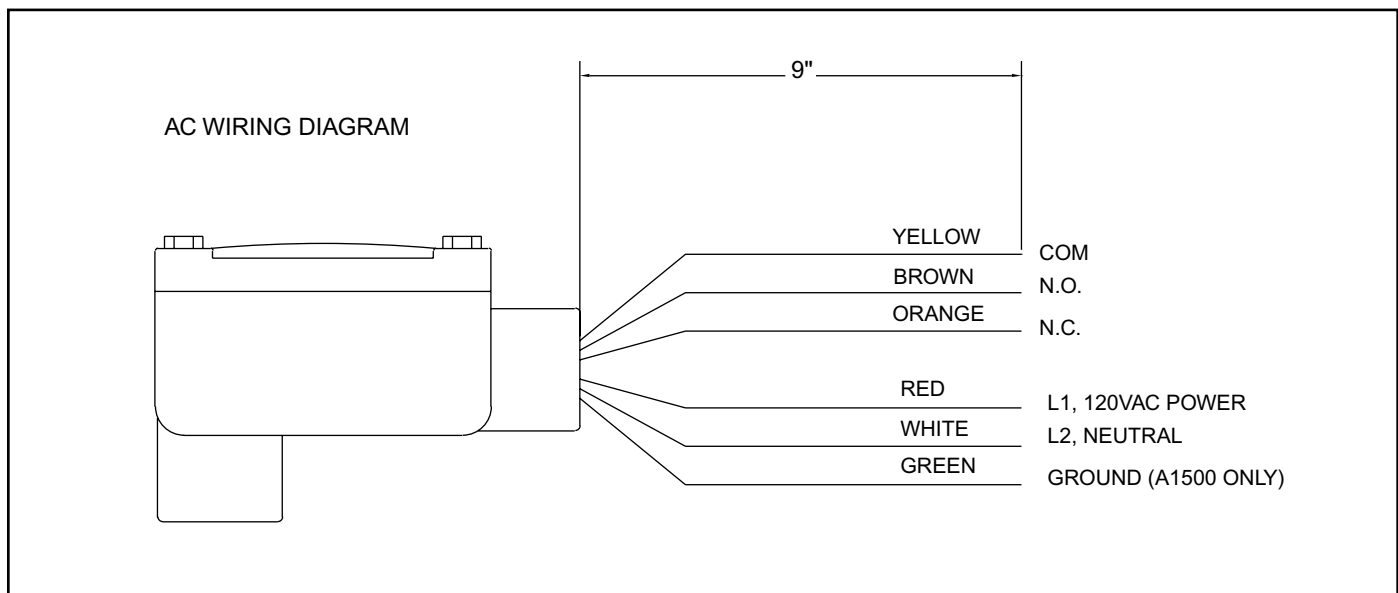


Figure 3

#### WARNING

To avoid electrical shock disconnect all sources of power before wiring.

### 5.2 Relay Connections

- 5.2.1 Set point relay is SPDT - 5 amp @115 VAC.

- 5.2.2 Make relay connections.  
(see figure 3, page 5)

#### WARNING

Remove power source before moving jumpers 120 VAC is present.  
DANGER

## SECTION 3 - CALIBRATION

### 6.0 Speed Range/ Hysterisis Selection

- 6.1 The operating speed range of the A1500 Series is 10 RPM - 4000 RPM.
- 6.2 Remove back cover of the speed switch.
- 6.3 Configure the two speed range jumper pins for the maximum operating speed according to the speed range chart.  
(see figure 4, page 6).
- 6.4 Configure the hysteresis jumper pin according to the set point chart.

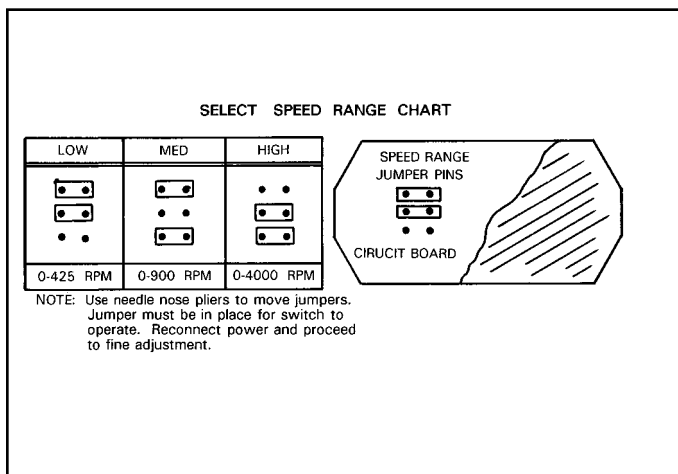


Figure 4

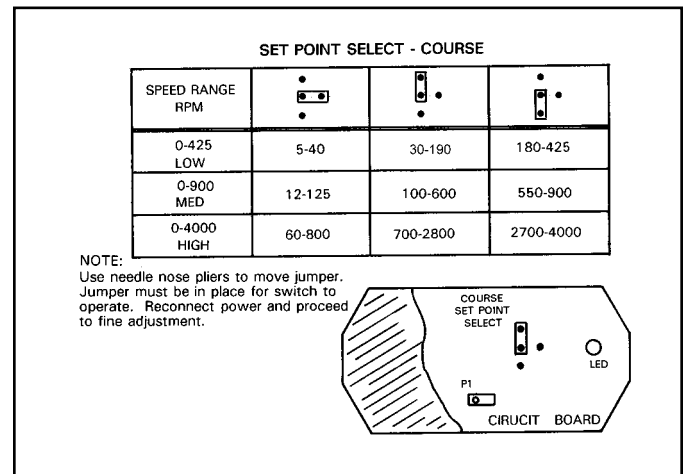


Figure 5

### 7.0 Set Point Calibration

- 7.1 The A1500 Series speed switch is calibrated while the monitored machine is running and power is applied to the speed switch. The relay will be energized while the operating speed is above the calibrated set point and de-energized while the operating speed is below the calibrated set point. The relay status is indicated by the red LED on the A1500 Series circuit board.  
(LED on = Relay energized and operating speed is above calibrated set point)  
(LED off = Relay de-energized and operating speed is below calibrated set point)
- 7.2 Start calibration by applying power to the A1500 Series speed switch and running the machine at normal operating speed. If the red LED is on this indicates that the operating speed is above the calibrated set point. To adjust the set point turn potentiometer P1 CCW until the red LED turns off. Then turn potentiometer P1 CW slowly until the red LED comes on and continue turning for the preferred set point (1/8 turn = approximately a 20% under speed set point). For under speed indication applications the red LED will be on during normal operation.

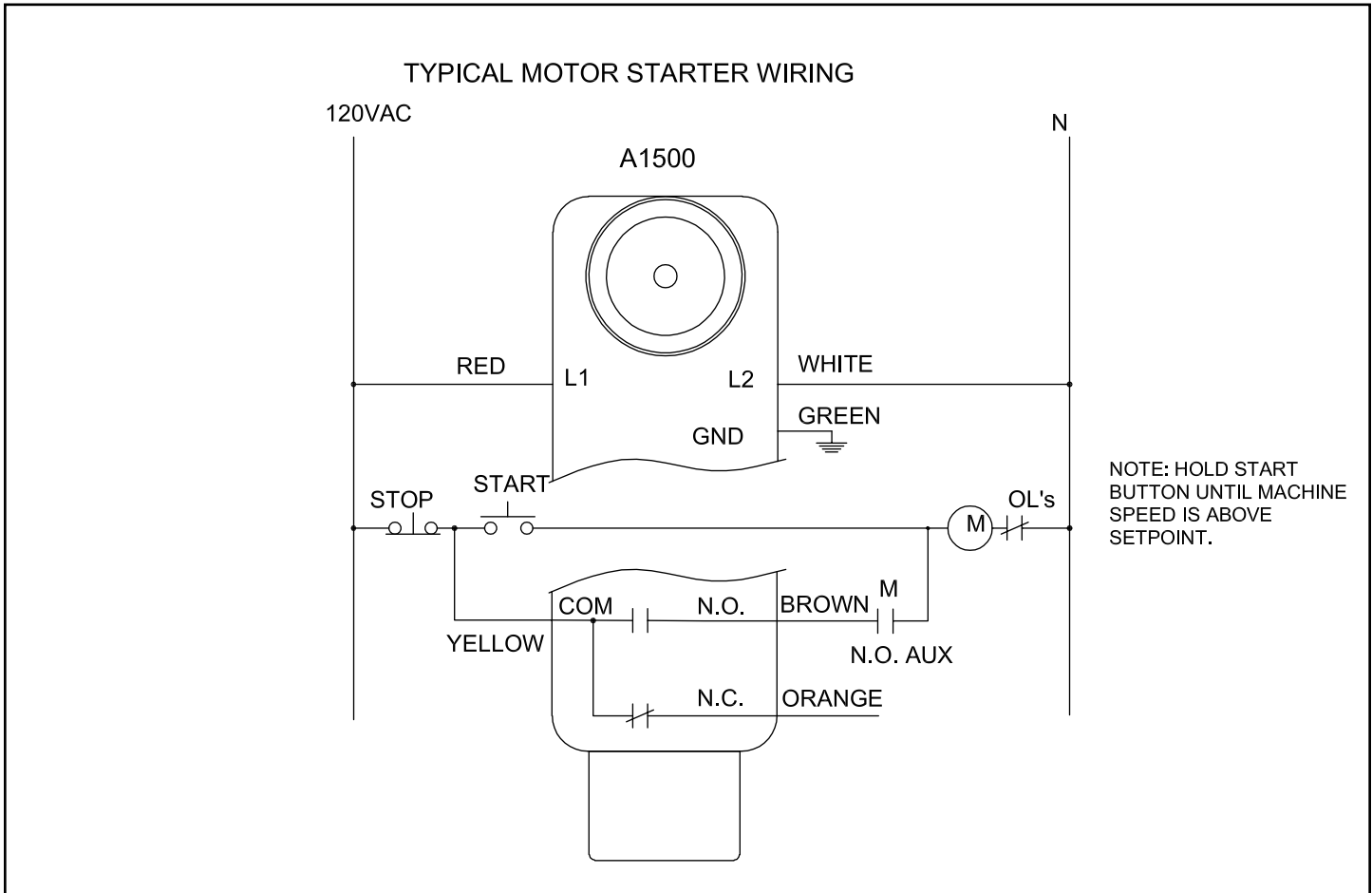
**7.3** If the red LED is off this indicates that the operating speed is below the calibrated set point. To adjust the set point turn potentiometer P1 CW until the red LED turns on. Then continue turning potentiometer P1 CW slowly for the preferred set point (1/8 turn = approximately a 20% under speed set point). For under speed indication applications the red LED will be on during normal operation.

**7.4** Confirm set point operation by slowing or stopping the machine.

**WARNING**  
 Do not set the relay trip point below 10 RPM. Setting the trip point below 10 RPM can result in the relay remaining energized even if the monitored shaft is rotating slower than 10 RPM. Operate the monitored machine and check the set point function before placing the switch in service.

### TYPICAL MOTION SWITCH CIRCUIT

#### SUGGESTED WIRING DIAGRAM



### SPARE PARTS LIST

Part No.	Description
1442	A1500 Switch w/o disc and bracket
1232	A1500NF Switch w/o disc and bracket
1217	A1500 Mounting Bracket
1234	A1500NF Mounting Bracket
1136	4" Magnet disc
1378	8" Magnet disc

### LIMITED WARRANTY

Process Control Systems, Inc. will repair or replace, at their option, F.O.B. factory, any part or unit which proves to be defective in material or workmanship within five years of purchase date, provided that part of the unit was installed and operated as recommended, to be established by examination of the part or unit at the factory. Goods returned under warranty must be shipped prepaid to the factory and accompanied by the serial number, description of defect, order number and date of purchase.

This warranty shall not apply to any Maxigard™ product which shall have been repaired or altered outside of the Process Control Systems factory or has been subject to misuse, negligence or accident.

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There is no further warranty either expressed or implied beyond that set forth herein.