



PROCESS CONTROL SYSTEMS, INC.
 327 LAKE HAZELTINE DRIVE, CHASKA, MN 55318

952-361-3026
 (Fax) 952-368-4129
 800-328-0738

MAXIGARD™



A2500-1

Dual Set Point Speed Switch

Introduction

The Maxigard A2500-1 Speed Switch is designed to monitor the rotation of critical driven shafts. The switch is precision built of quality material and completely factory tested to insure long life and trouble free operation.

Principle of Operation

The Maxigard A2500-1 speed switch is supplied with a non-contacting sensor and magnetic target. The sensor signal is not impaired by buildup of dust or any other foreign material on the magnet target or sensor. The A2500-1 has two adjustable set points and is designed to detect under speed and/or over speed of the monitored shaft. The low set point relay has a built in power up time delay of approximately 7 seconds which allows machinery controlled through the motor starter circuit to reach the set point during start-up. The delay activates on power-up only and is reset when power is interrupted and reapplied to the A2500-1 Speed Switch. When properly installed and calibrated, in the event of a power failure the relays will de-energize and put the switch into an alarm condition.

Components

THE A2500-1 SYSTEM INCLUDES:

- 4" MAGNET DISC (OTHER OPTIONAL TARGETS AVAILABLE)
- SELF CONTAINED SPEED SWITCH HOUSING WITH SENSOR AND SWITCH CIRCUIT
- MOUNTING BRACKET WITH MOUNTING SADDLE

CALL TOLL FREE  800-328-0738

www.maxigard.com

E-mail: techsupport@maxigard.com

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)

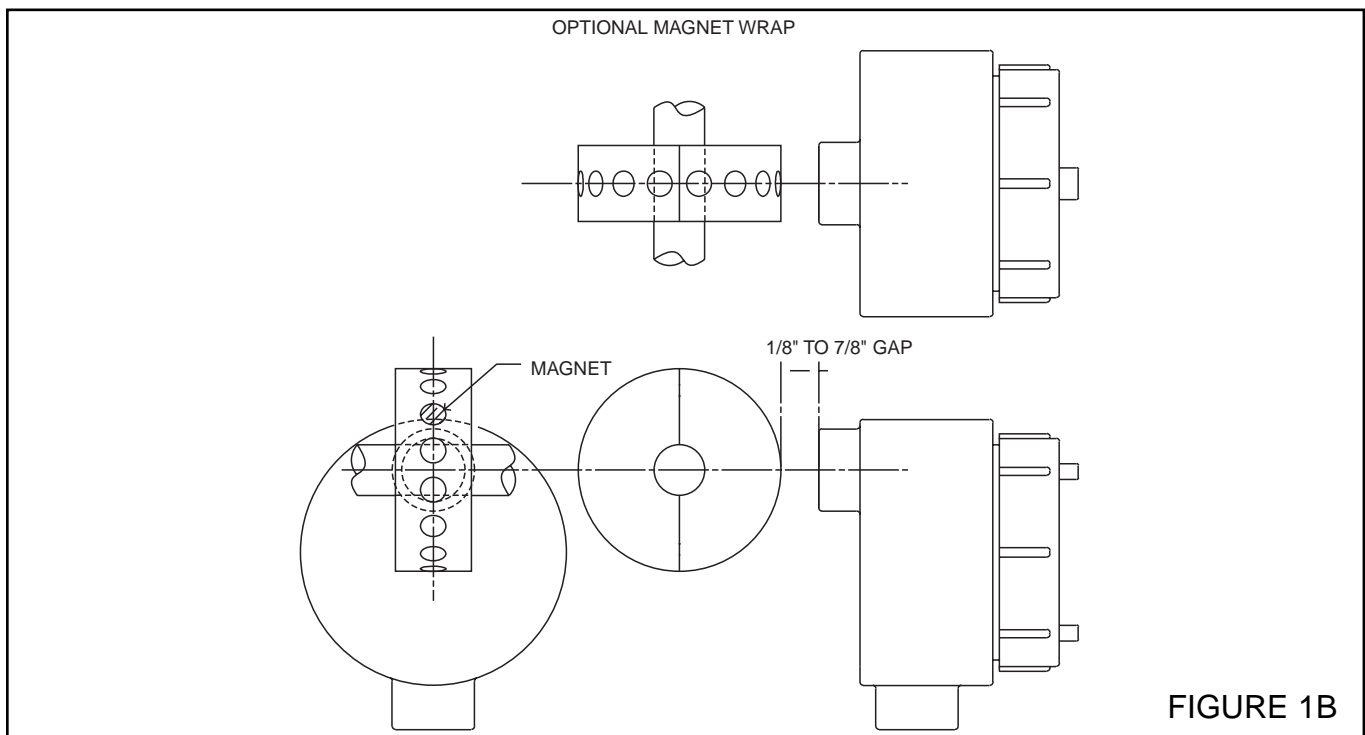
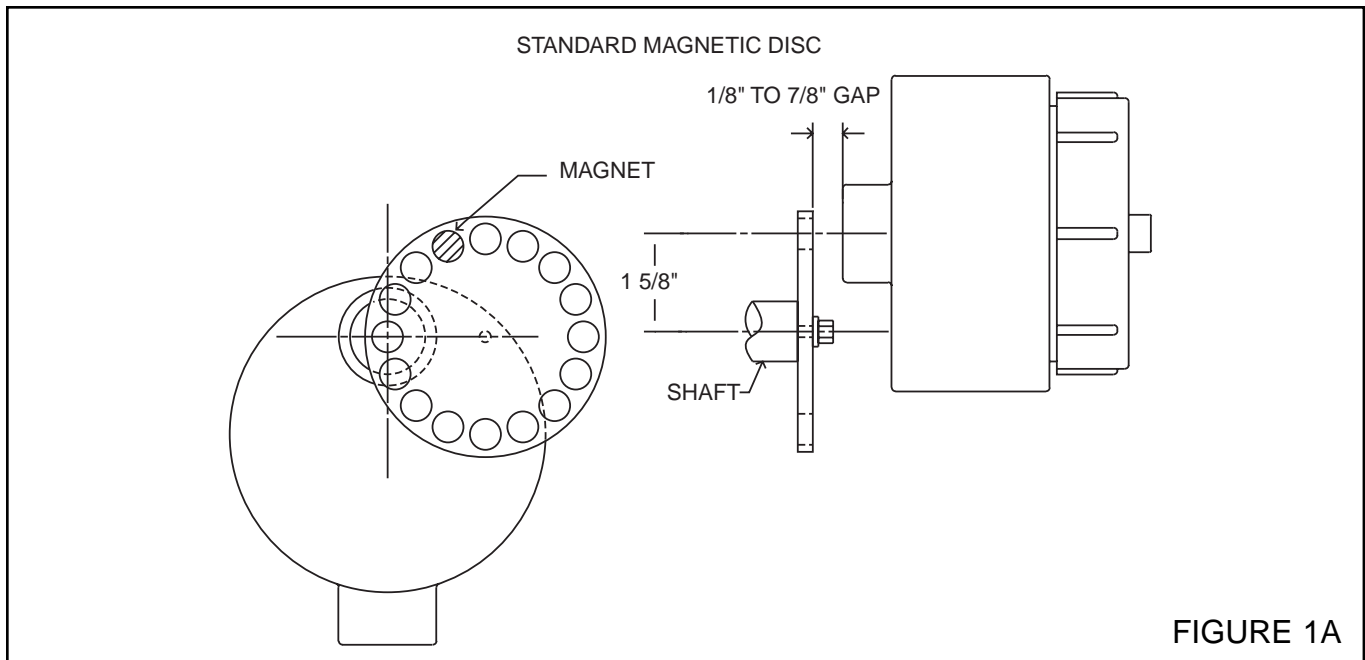
- 2.1 Separate the two halves of the magnet wrap by loosening the cap screws holding the two halves together.
- 2.2 Place both halves of the magnet wrap around the shaft. Re-insert and tighten the cap screws making sure the wrap is square to the shaft.
(see figure 1B, page 3).

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 Switch

- 3.1 Place the switch so the sensor is centered directly in front of the magnets in 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".



4.0 A2500-1 Speed Switch Housing

- 4.1 The A2500-1 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).

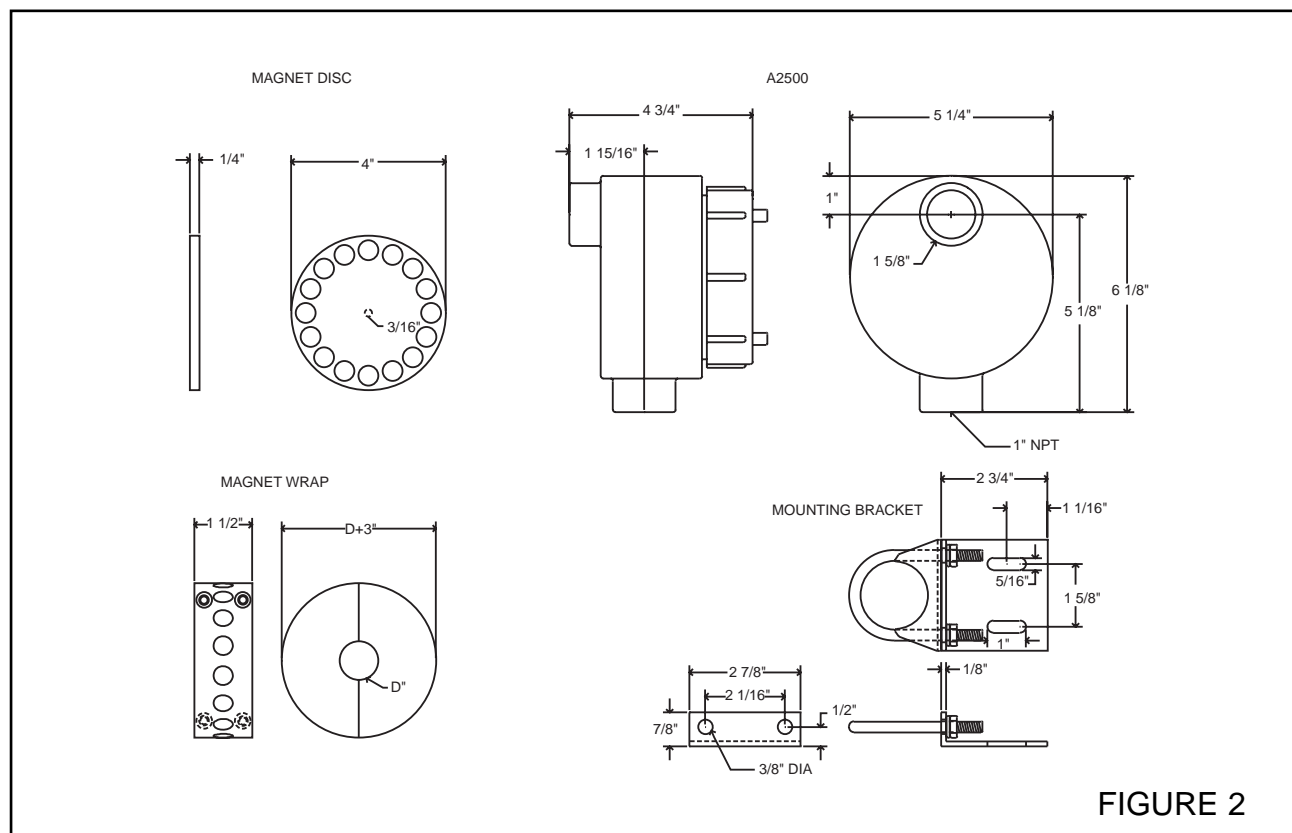


FIGURE 2

SECTION 2 - FIELD WIRING

5.0 Wiring the A2500-1 Speed Switch

- 5.1** Power connections and output connections to the A2500-1 Speed Switch are shown on figure 3, page 5.
- 5.2** Connect 115 VAC power to terminals 1 & 2 of the A2500-1 terminal strip. Connect the equipment safety ground to terminal 3 on the A2500-1 terminal strip. The green power LED will be on when the switch is powered. (see figure 3, page 5).
- 5.3** Make Relay connections to terminals 4 through 9 as required by the application. Normally open contacts are held closed and normally closed contacts are held open when the operating speed exceeds the set point speed for that particular relay contact. When a relay is energized the yellow LED for that relay will be on. (see figure 3, page 5)
- 5.4** If the optional display meter is provided connect the + to terminal position 11 and the - to terminal position 12.

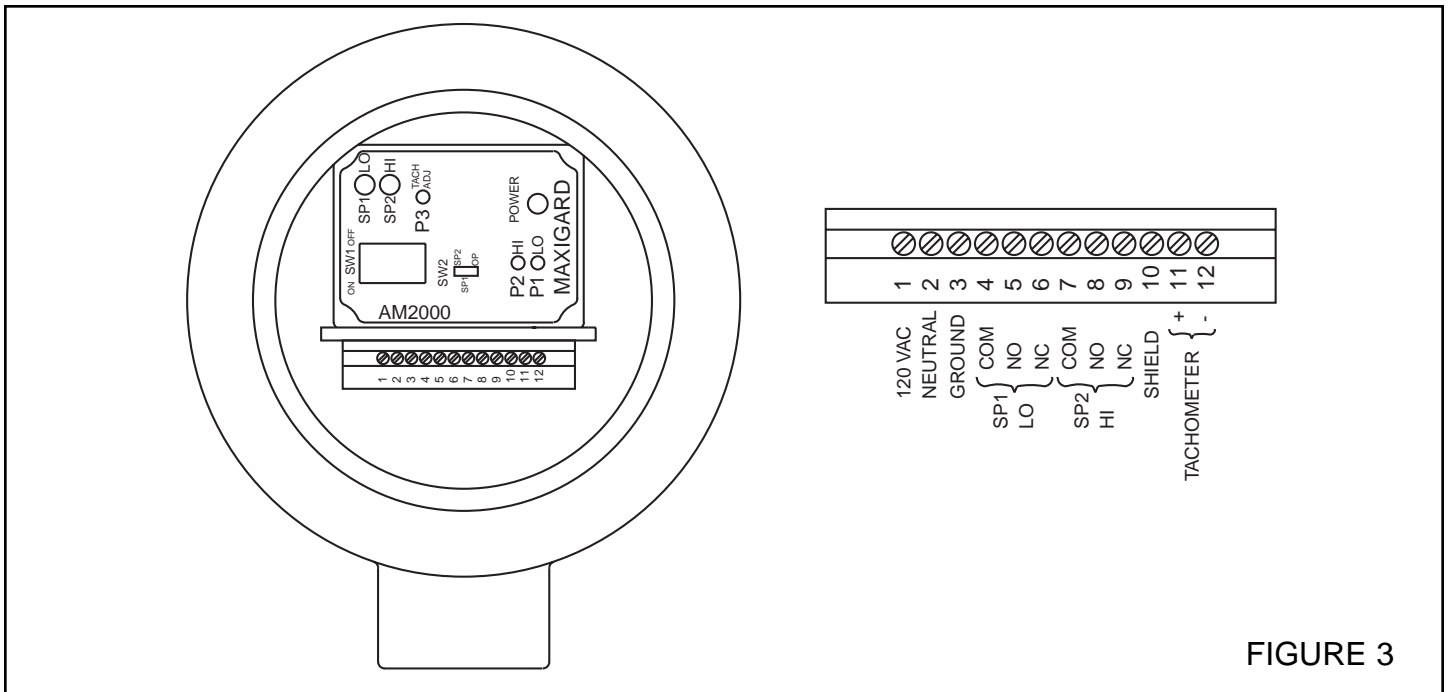


FIGURE 3

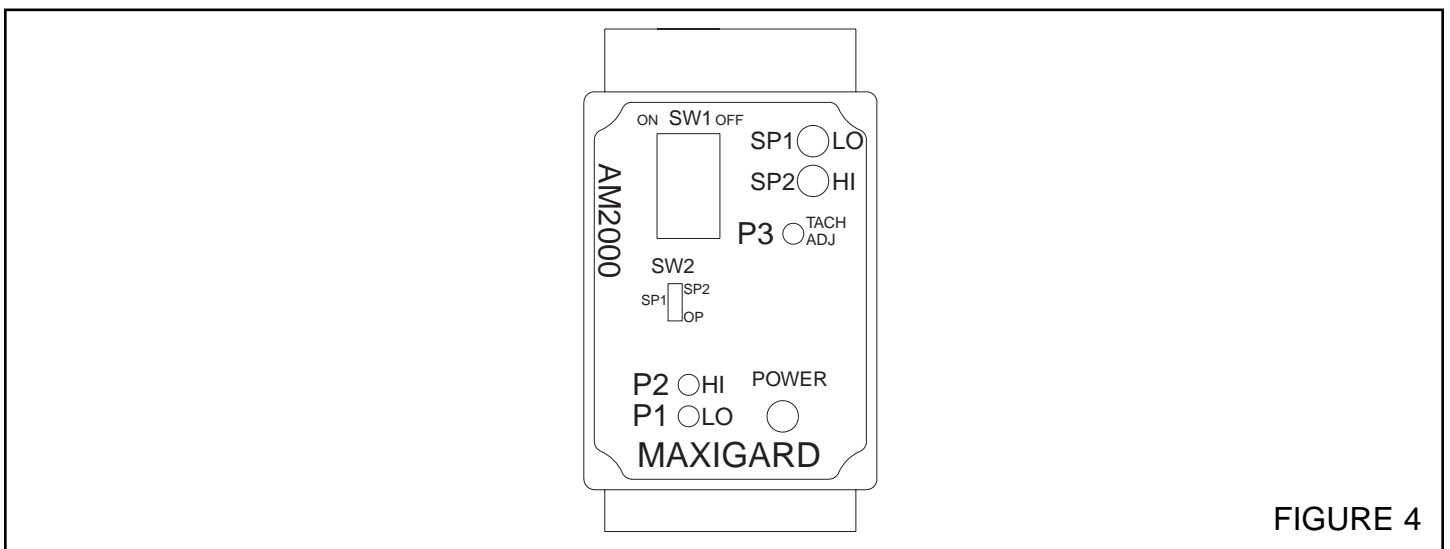


FIGURE 4

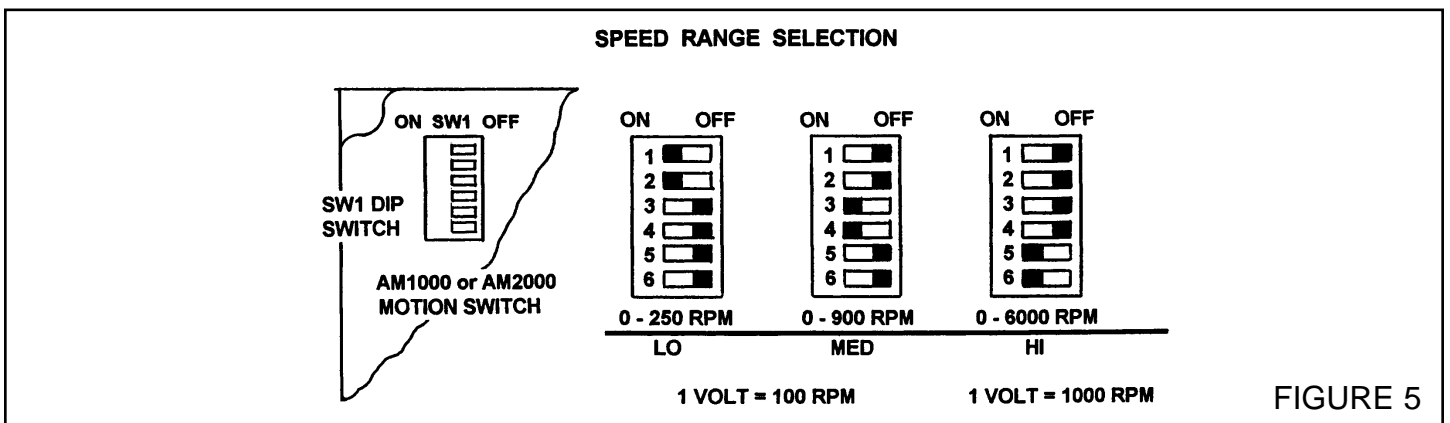
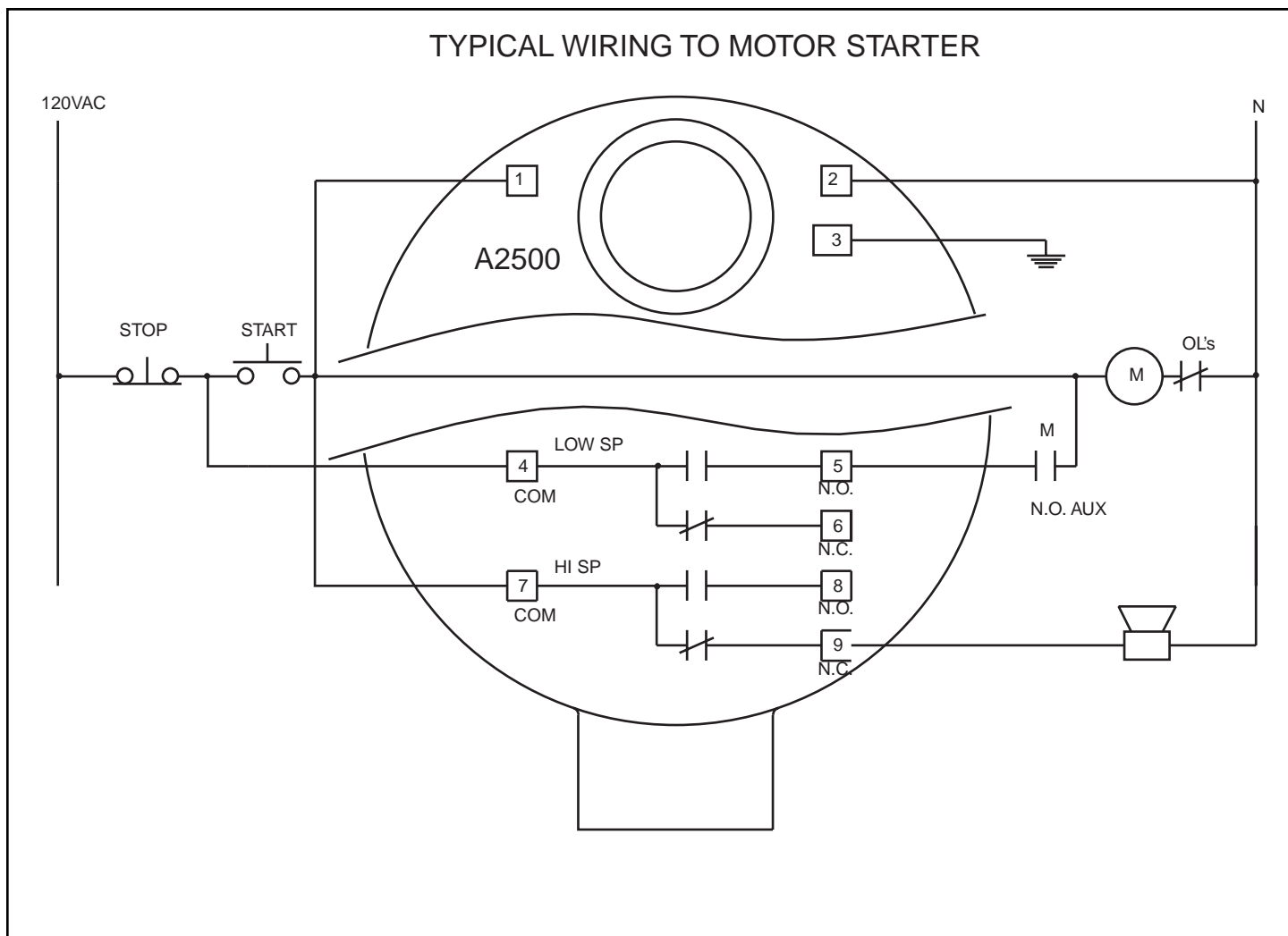
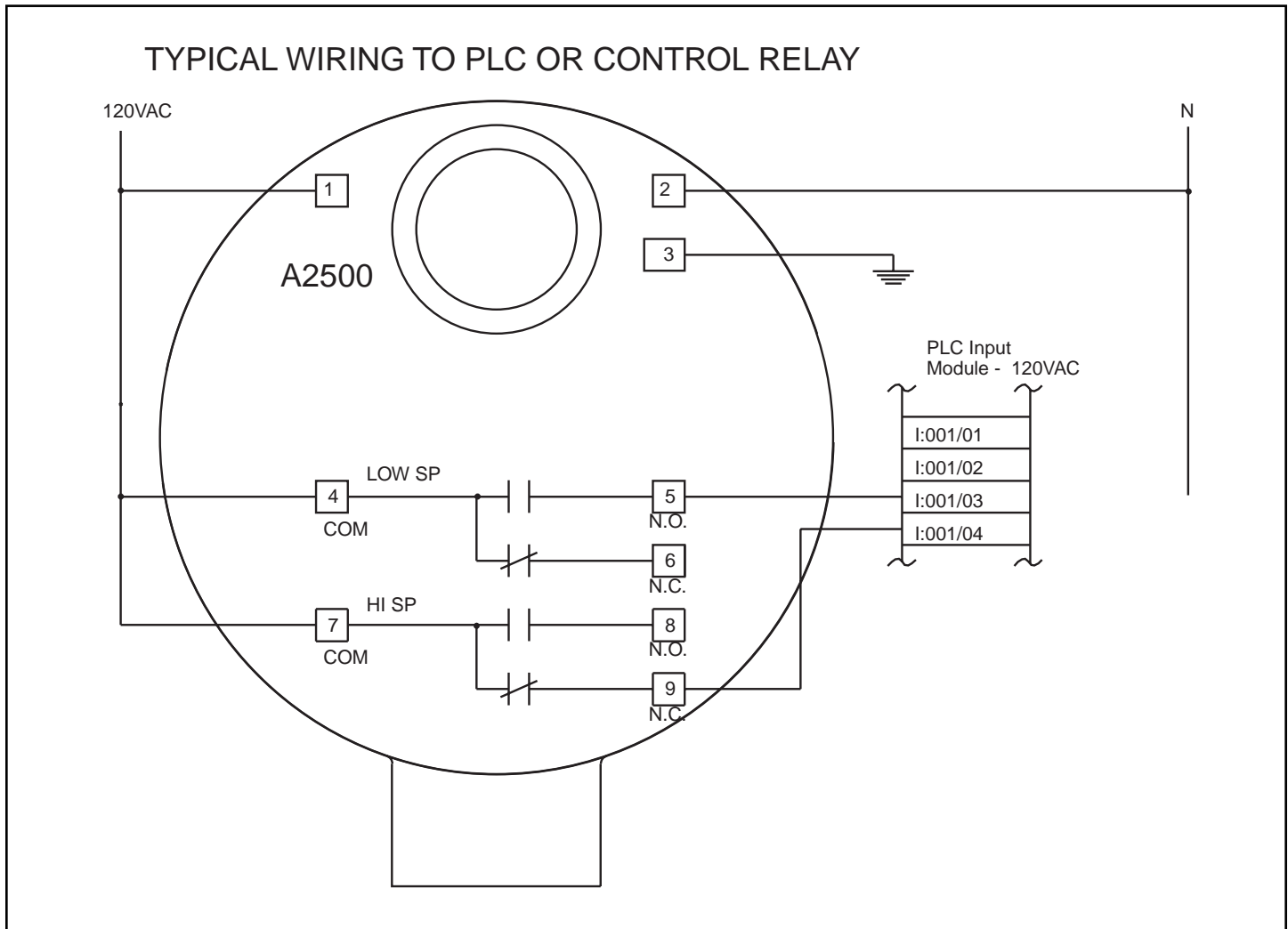


FIGURE 5



When the start pushbutton is pressed the A2500-1 speed switch is powered on and a “power on” delay of approximately 7 seconds begins. During the “power on” delay the low set point relay contacts are held in the switched position allowing the motor to run. As long as the monitored shaft speed is above the low set point speed before the “power on” delay period has expired, the relay contacts will remain in the switched position allowing the monitored machine to run normally. If the monitored shaft speed slows down or stops below the low set point speed the N.O. relay contact holding in the motor starter contact will open and drop out the motor starter. The “power on” delay is reset when the motor starter drops out and power is interrupted to the A2500-1.

An additional set point is available to sound an alarm horn, turn on another type of warning device, or interlock with other equipment.



When 120 VAC is applied to L1 and L2 the A2500-1 speed switch is powered on and a “power on” delay of approximately 7 seconds begins. During the “power on” delay the low set point relay contacts are held in the switched position allowing the motor to run. As long as the monitored shaft is above the set point speed before the “power on” delay period has expired, the relay contacts will remain in the switched position. If the monitored shaft speed stops or slows down below the set point speed the N.O. relay contacts open. When the monitored shaft speed exceeds the set point the N.O. relay contacts close. The “power on” delay is reset when power is removed from L1 and L2. If the A2500-1 is continuously powered the “power on” delay only occurs at initial power up.

SECTION 3 - CALIBRATION

6.0 Speed Range Configuration

6.1 Set dip switch (SW1) located on the top of the speed switch module for the monitored shaft operating speed range.
(see figure 3, 4, 5 page 5)

7.0 Calibration With a Voltmeter

7.1 Connect the voltmeter leads to terminals 11(+) and 12(-) on the A2500-1 terminal block. Set the voltmeter to the DC volts scale. With 120 VAC applied to terminals 1 and 2 run the machine at normal operating speed.

7.2 With 120 VAC applied to terminals 1 and 2 run the machine at normal operating speed. Place the slide switch (SW2) in the operating speed position (OP). The A2500-1 is designed to display the speed as a DC voltage.
(see figure 6, page 6)

Low Speed Range	1.0 VDC = 100 RPM	
Medium Speed Range	1.0 VDC = 100 RPM	
High Speed Range	1.0 VDC = 1000 RPM	
<u>Examples</u>		
Low Speed Range	VDC = 1.25	Speed = 125 RPM
Medium Speed Range	VDC = 6.50	Speed = 650 RPM
High Speed Range	VDC = 3.75	Speed = 3750 RPM

FIGURE 6

7.3 To calibrate the low set point place the slide switch in the low set point position (SP1). Adjust potentiometer P1 until you reach the desired set point on the voltmeter (CW to increase CCW to decrease). The machine does not need to be running to make this adjustment. The SP1 yellow LED will be on when the operating speed exceeds the set low point and the relay is energized.

EXAMPLE	
100% Operating Speed = 500 RPM	
100% VDC = 5.00	
80% Set Point Speed = 400 RPM	
80% Set Point VDC = 4.00	

- 7.4** To calibrate the high set point place the slide switch in the high set point position (SP2). Adjust potentiometer P2 until you reach the desired set point on the voltmeter (CW to increase CCW to decrease). The machine does not need to be running to make this adjustment. The SP2 yellow LED will be on when the operating speed exceeds the high set point and the relay is energized.

EXAMPLE

100% Operating Speed = 500 RPM
100% VDC = 5.00
90% Set Point Speed = 450 RPM
90% Set Point VDC = 4.50

- 7.5** The A2500-1 Speed Switch is now calibrated.

SPARE PARTS LIST

Part No.	Description
1736	A2500-1 Without Disc or Bracket
1217	Mounting Bracket
1136	4" 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.

Process Control Systems, Inc. warrants its products, but not their application, and shall not be liable for any incidental or consequential damages incurred through the use or loss of use of a Process Control Systems product. No representatives or other person is authorized or permitted to make any warranty or assume for this company any liability not strictly in accordance with this guarantee.

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