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MAXIGARD™



B2000 SERIES TACHOMETERS DIGITAL OR ANALOG DISPLAYS

Introduction

The MAXIGARD B2000 series tachometers are designed to display shaft rotational speed on digital and/or analog meters. They are precision built of quality material and factory tested to insure accuracy, long life and trouble free operation.

Principle of Operation

While the shaft (with magnet disc or optional wrap attached) is rotating, a signal is generated and picked up by the sensing head. This signal is not impaired by build up of dust or any other foreign material on the magnet disc or sensing head. The generated signal is processed through an electronic circuit and converted into a analog signal. The output signal is linear and proportional to the speed of the shaft.

Components

THE B2000 TACHOMETER PACKAGE INCLUDES:

- 4" MAGNET DISC (OTHER OPTIONAL TARGETS AVAILABLE)
- SENSING HEAD WITH 10' OF CABLE
- SENSING HEAD MOUNTING BRACKET
- ELECTRONIC CALIBRATION CIRCUIT
- ANALOG METER, DIGITAL DISPLAY IS OPTIONAL

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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.

SENSING METHOD

STD. SENSING HEAD & DISC

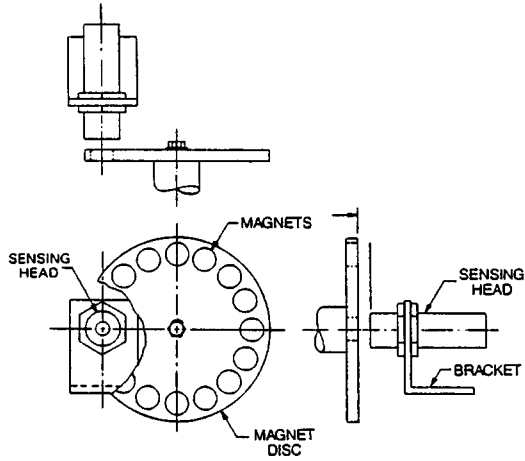


FIGURE 1B

STD. SENSING HEAD & WRAP

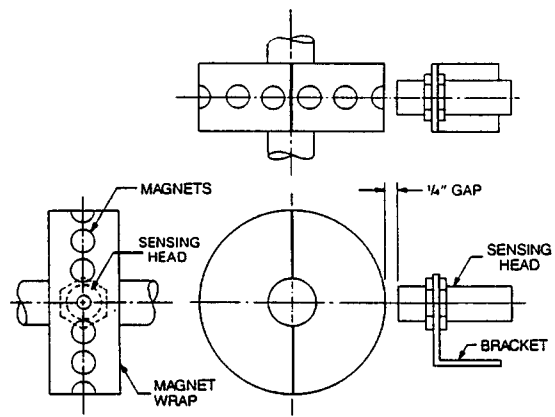


FIGURE 1A

DIMENSIONAL DATA

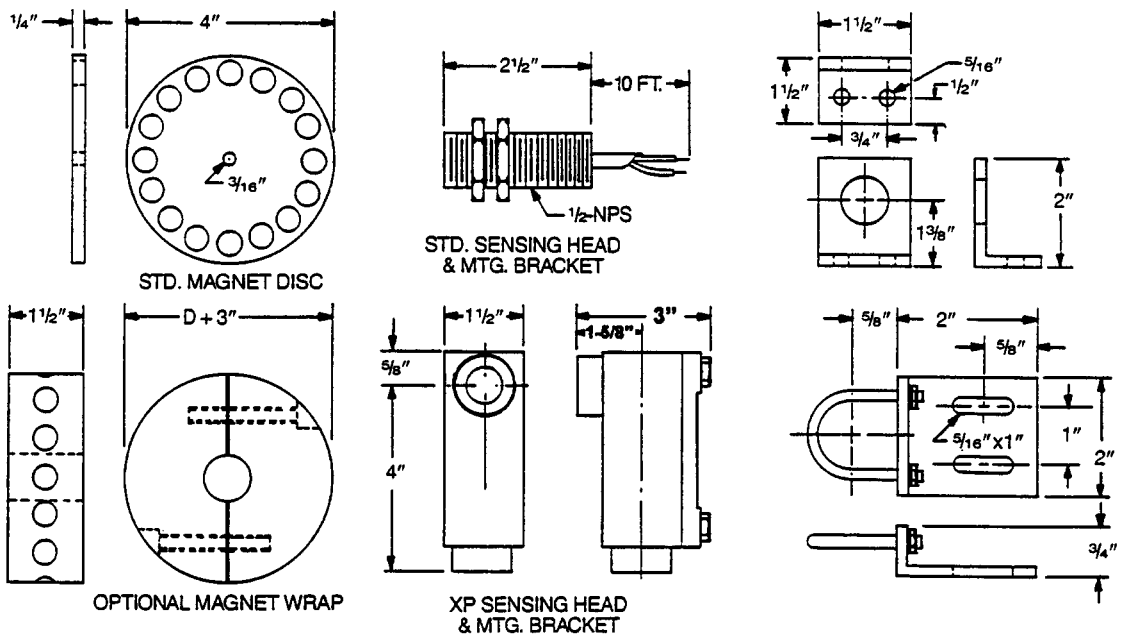


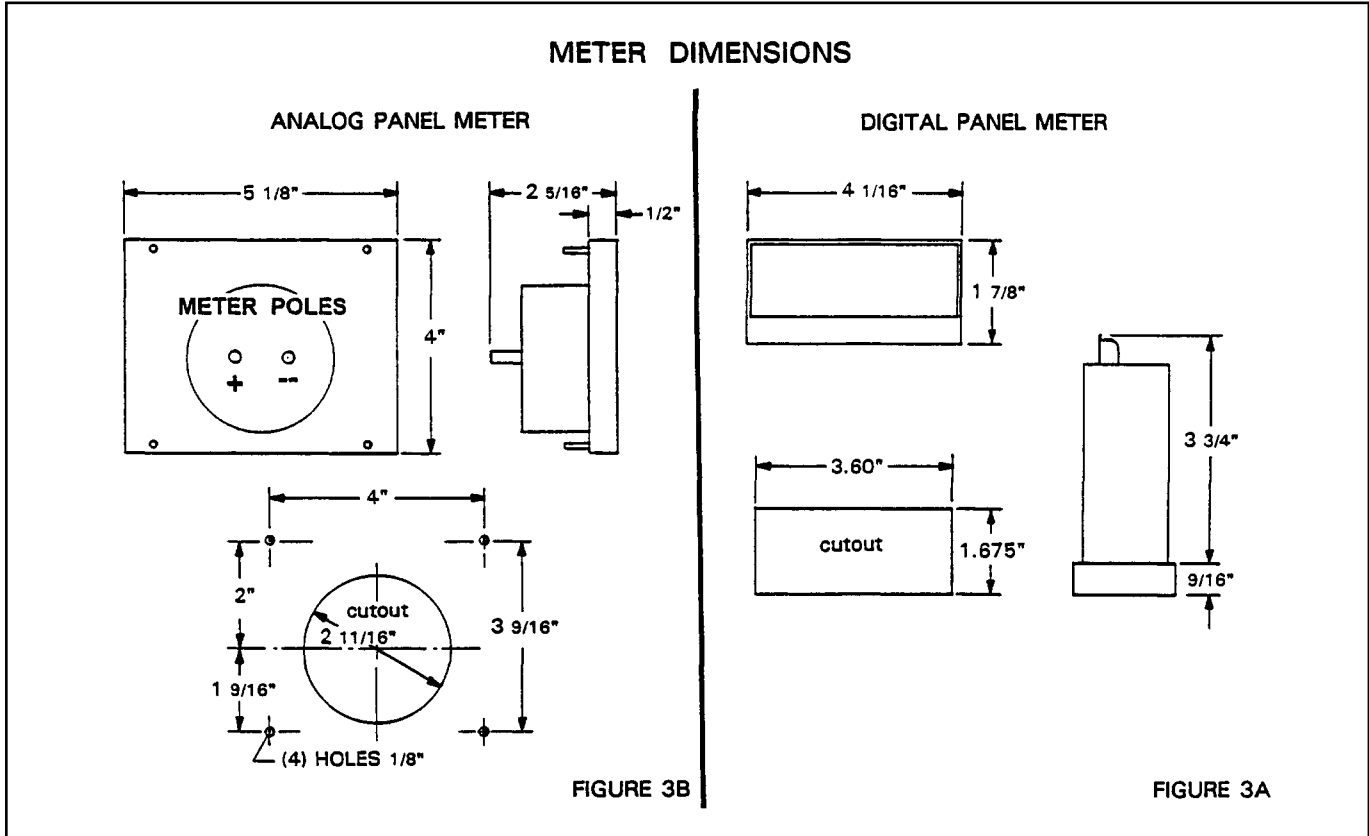
FIGURE 2

3.0 Mounting the Sensing Head

- 3.1 Place the sensing head so the sensor is centered directly in front of the magnets of 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" - 3/8".
- 3.3 The sensing head comes standard with 10' of cable, if additional cable length is required, be sure to maintain continuity.

4.0 Meter Installation

- 4.1 Cut meter cutout and drill mounting holes according to the layout dimensions.
(see figure 3A and 3B, page 4)
- 4.2 Install meter horizontally and use hardware provided to secure meter to panel.



SECTION 2 - FIELD WIRING

5.0 Wiring and Energizing

5.1 Sensing Head

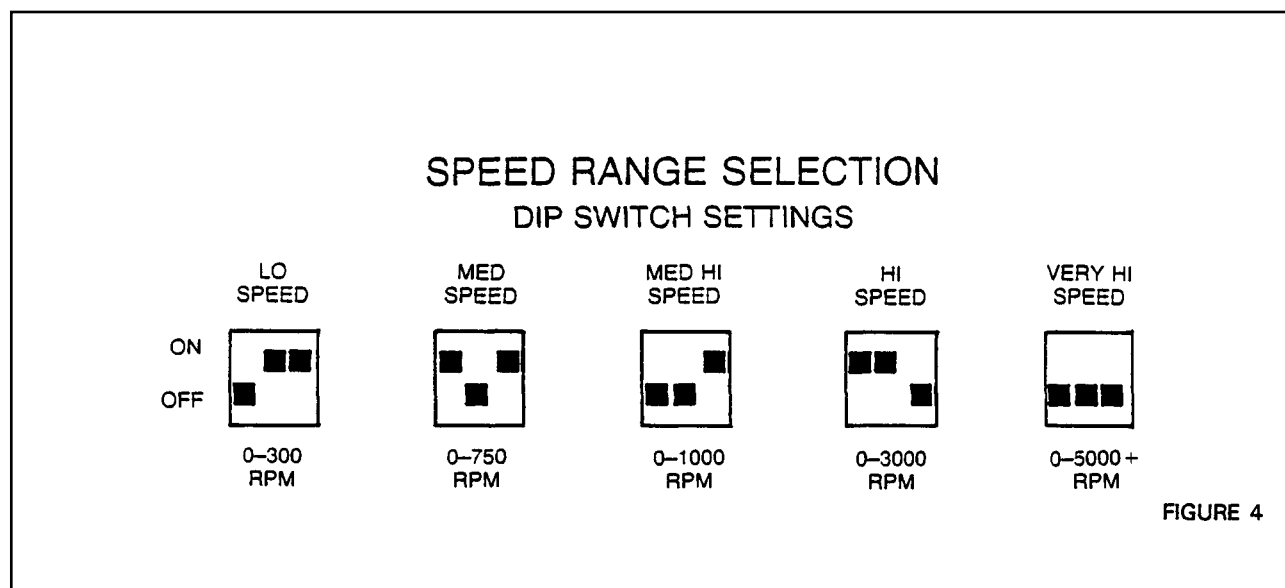
5.1.1 Connect sensing head cable leads to terminal block TB1, located on the circuit board.

(see figure 5, page 7)

5.1.2 The sensing head comes standard with 10' of cable. Additional cable can be added up to 10,000'. Maintain continuity and make good splices.

NOTE

Sensing head cable, use "Belden" #8761 or equal. Cable should not be run in same conduit as power lines. Maximum distance of cable run, 10,000'. Maintain continuity and make good splices.



5.2 Meter (Analog)

5.2.1 Remove shunt wire form between the two meter poles located on the back side of the meter barrel.

5.2.2 Make meter wire connections between terminal block TB1 and the (+) and (-) poles located on the back of the meter.

(see figure 3A, page 4 and figure 5, page 7)

6.0 Speed range Selection

- 6.1 Set the three position dip switch for the operating speed range per the speed range illustration.
(see figure 5, page 7)

NOTE

Make the settings before calibrating the circuit and meter.

7.0 Calibrating the Tachometer Circuit Board

- 7.1 Connect 115 VAC power to terminals L1 and L2 of terminal block TB1.
(see figure 5, page 7)

WARNING

Be sure line voltage is off before connecting power.

- 7.2 Check sensing head installation and gap setting.
(see figure 1A and 1B, page 3)

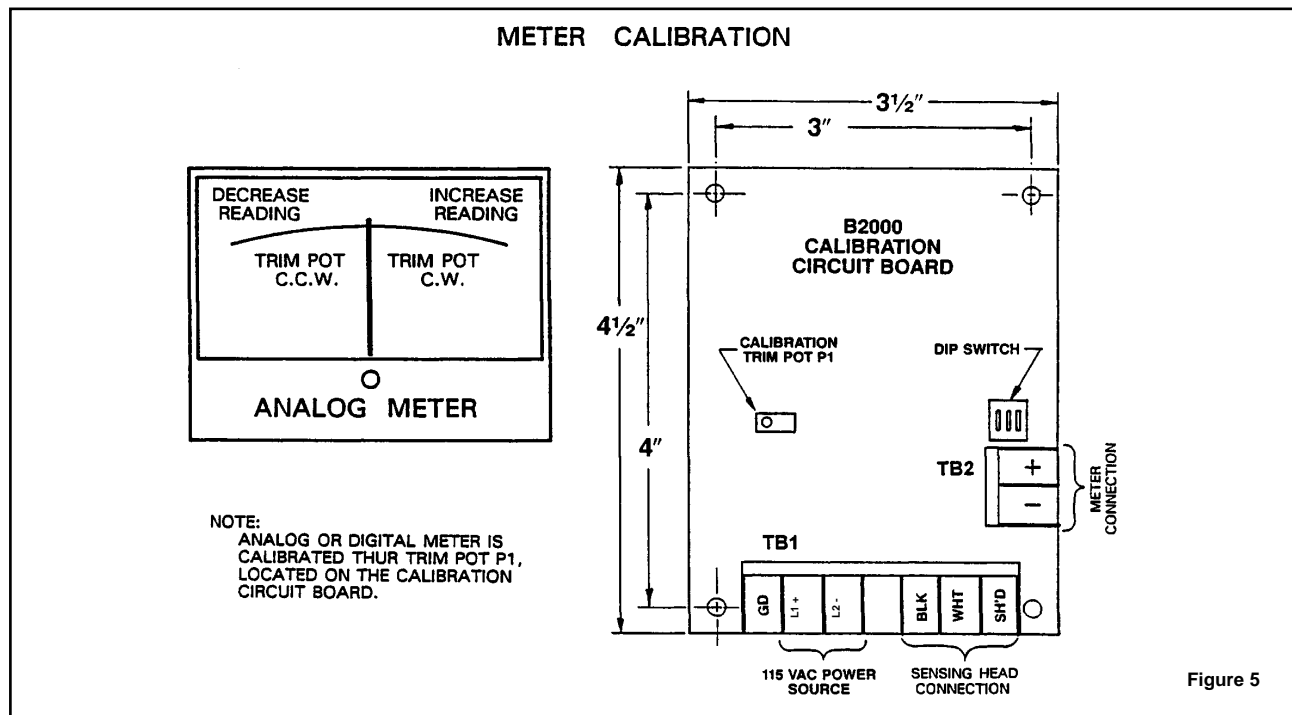
WARNING

Proceed with caution, 115 VAC is present and could result in an electrical shock, causing injury or death.

- 7.3 Start the monitored machine and run at the normal high operating speed and apply 115 VAC power to the calibration circuit board.
- 7.4 Adjust meter reading to match the known speed of the monitored machine.
- 7.4.1 Turn POT P1, C.W. or C.C.W. to increase or decrease the meter reading.

NOTE

The calibration circuit is dampened to eliminate excessive reading fluctuation and bounce.



INSTALLATION AND OPERATING INSTRUCTIONS FOR DIGITAL TACHOMETERS

This section contains instructions for mounting the digital meter and for connecting electrical power and signal input to the instrument.

Unpacking: Upon receipt of the shipment, inspect the container for any evidence of damage. Report damage immediately to the shipping agent.

8.0 Mounting the Digital Meter

8.1 The meter can be mounted in a panel of any thickness greater than 1/16", or less than 3/16". For panel cutout dimensions, meter size and the depth behind the bezel needed for meter volume, see figure 3A, page 4. Be sure to provide enough space for cable bend behind the meter.

8.2 The meter case is retained in place in the front panel cutout by the rear mounting plate.
(see figure 6, page 8)

8.2.1 Insert the meter through the cutout opening from the front side.

8.2.2. Slide the rear mounting plate over the meter and slide it forward to the rear of the front panel.

8.2.3 Remove the front meter filter and insert mounting clips and screws. Tighten screws until meter is secure. Re-insert the front meter filter.

9.0 Wiring and Energizing

9.1 Signal Input

- 9.1.1 Make wire connections (18 gage) between calibration circuit board, terminal block TB2 and the signal in terminal located on the back of the meter.
(see figure 5, page 7 and figure 7A and 7B, page 9)

9.2 Operating Power

WARNING
Be sure line voltage is off before connecting power.

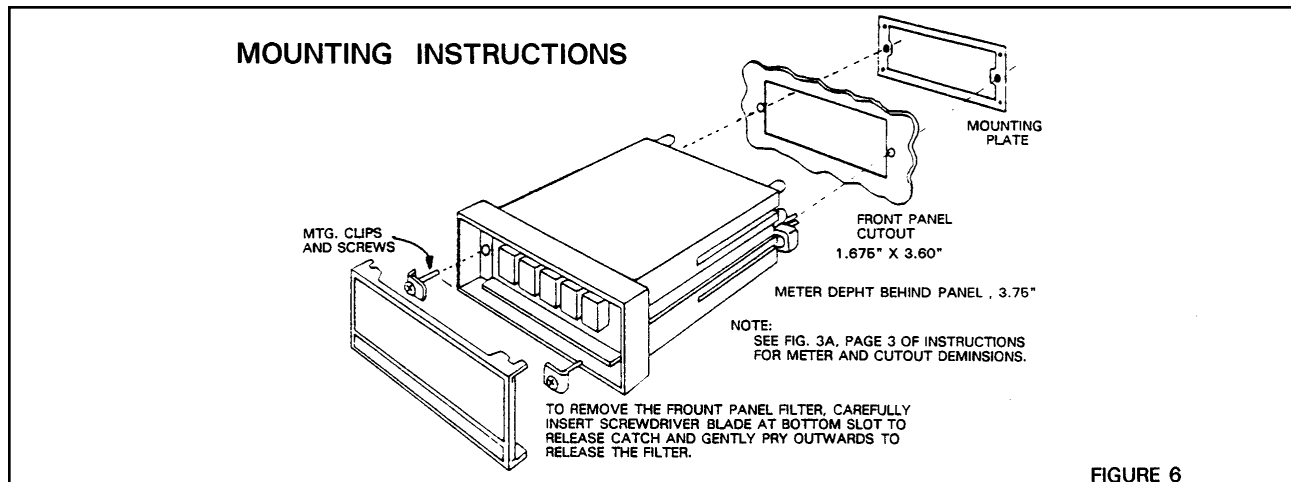
- 9.2.1 Connect 120 VAC or 240 VAC to terminals L1 and L2, located on the back of the meter.
(see figure 7A or 7B, page 9)

WARNING
Proceed with caution, 115 VAC is present and could result in an electrical shock, causing injury or death.

10.0 Speed Range Selection

- 10.1 Set the three position dip switch for the operating speed range per the speed range illustration.
(see figure 5, page 7)

NOTE
Make the settings before calibrating the circuit and meter.

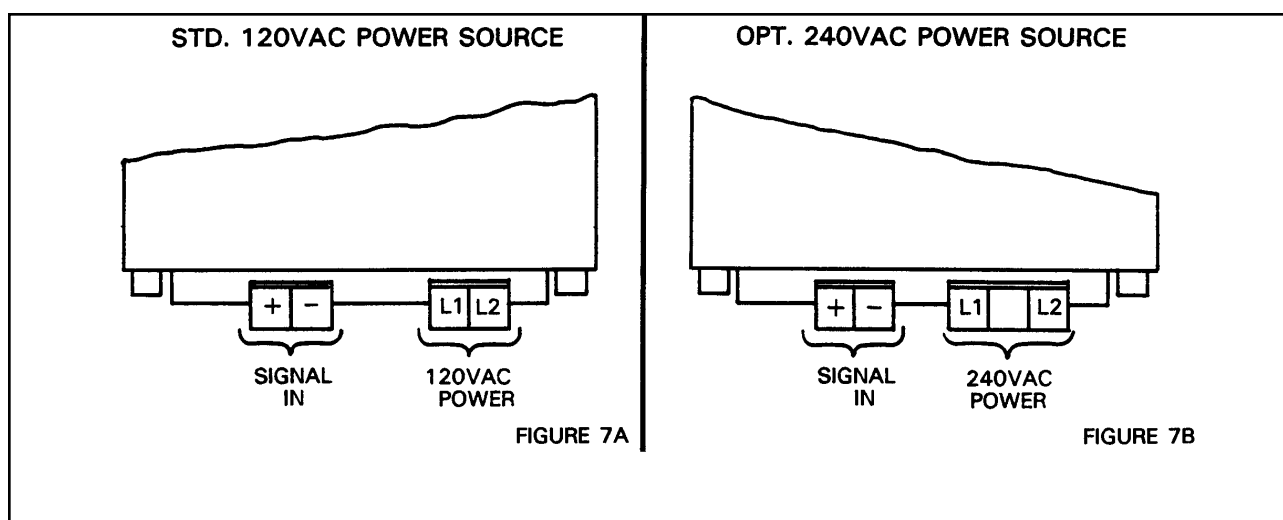


11.0 Calibrating the Circuit Board and Meter

- 11.1 Start the monitored machine and run at the normal high operating speed and apply 115 VAC power to the calibration circuit board.
- 11.2 Adjust meter reading to match the known speed of the monitored machine.
- 11.3 Turn POT P1 C.W. or C.C.W. to increase or decrease the meter reading. (see figure 5, page 7)

NOTE

The calibration circuit is dampened to eliminate excessive reading fluctuation and bounce.



SPECIFICATIONS

Input:	Single-ended with optional provision to offset the zero of the reading being displayed	Decimals:	Consult factory to change decimal point
Scale Ranges:	Two built in header selectable ranges of ± 2 VDC & ± 20 VDC full scale	Overload Indication:	When input exceeds the full scale on any range being used, most significant "1" digit is displayed with all other digits blank
Accuracy:	(0.05% of reading ± 1 digit)	Power Requirements:	120/240 VAC 50/60 HZ approximately 4.5 watts
Display:	0.56" high efficiency LED Display Hold and Test Function	Warm up Time:	One minute to specified accuracy
Polarity:	Bipolar. Assumed positive, displays negative	Operating Temperature:	0-50°C

SPARE PARTS LIST

Part No.	Description
1221	Circuit Board, Calibration Card
1129	Sensing Head, W/10' Cable (Std) Analog
1130	Mounting Bracket and Jam Nuts (Std)
1132	Sensing Head, W/10' Cable (XP Analog)
1134	Mounting Bracket (XP)
1136	Magnet Disc (4" diameter)
1378	Magnet Disc (8" diameter)
1177	Meter, Tachometer (Analog) Spec Scale
1363	Meter, Tachometer (Analog) single Set Point
1362	Meter, Tachometer (Analog) Dual Set Point
1324	Meter, Tachometer (Digital) 3 1/2 LED
1731	Meter, Tachometer (Digital) 4 1/2 LED
1139	Cable, Sensing Head, 2 Wire

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.