

# Digital Tach/Ratemeter

ELECTRO

SENSORS

DD106T



## Features:

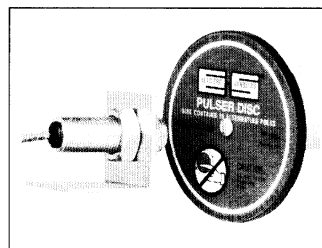
- Field Adjustable Calibration
- Simple Installation
- Displays RPM or Rate Engineering Units
- Bright .43-Inch High Efficiency LED Display
- Terminal Strip Wiring Connections
- $\pm 1$ -Digit Accuracy
- Switch Selectable Speed Ranges

## Description:

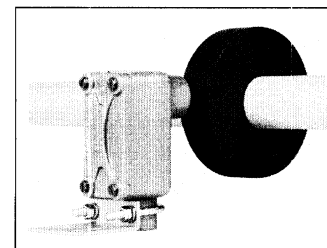
The Model DD106T Digital Tach/Ratemeter unit is a complete digital tachometer system that provides linear, visual indication of speed. Field calibration by the user permits a direct readout in RPM or rate engineering units such as feet-per-minute (FPM), gallons-per-minute (GPM), etc. This feature provides a significant display of numerical data without the need for conversion. The 0-1999 rpm range is accurate to  $\pm .1\%$  of the reading.

## Principle of Operation:

While the monitored shaft is rotating, the pulser disc mounted on the shaft generates an alternating magnetic field whose frequency is proportional to the speed of the monitored shaft. This magnetic field is detected by the sensor and is transmitted to the meter. There, the signal is converted to a digital reading that is directly proportional to the shaft speed.



Sensing Head and Pulser Disc



Optional Explosionproof Sensor and Pulser Wrap

## Pulser Disc:

The end of the shaft to be monitored must be center drilled to a depth of 1/2-inch with a No. 21 drill and tapped for 10-32UNF. After applying Loctite® or a similar adhesive on the threads to keep the pulser disc tight. The pulser disc should be attached, decal side out, with the supplied 10-32UNF machine screw and lock washer.

## Pulser Wrap (optional):

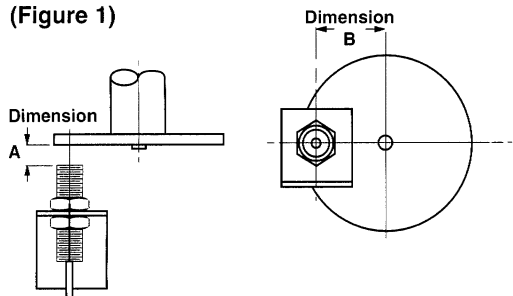
Pulser Wraps are custom manufactured to fit the shaft they will be mounted on. When the wrap is shipped, four allen-head cap screws hold the two halves of the wrap together. These screws must be removed so that the wrap is in two halves. Place the halves around the shaft, reinsert the screws and torque them to 8 foot pounds.

**Sensor Installation:**

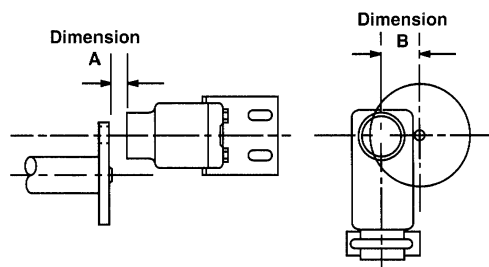
The standard sensor is supplied with a mounting bracket and two jam nuts. The explosionproof sensor is supplied with a slotted mounting bracket. Sensors should be installed so the center line of the magnets pass in front of the center of the sensor as the disc or wrap rotates. When using the pulser disc, the center of the magnetized area of the disc, shown as Dimension B in figures 1 and 3, is 1-3/4 inches from the center hole of the disc.

The gap distance between the sensor and the disc or wrap, Dimension A in the diagrams, can be from 1/16 inch to 1/4 inch. To achieve the proper gap distance, adjust the jam nuts holding the standard sensor in the mounting bracket, or adjust the position of the explosionproof sensor using the slots on its mounting bracket.

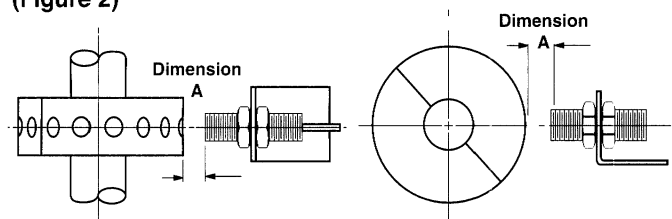
**Standard Sensor and Disc (Figure 1)**



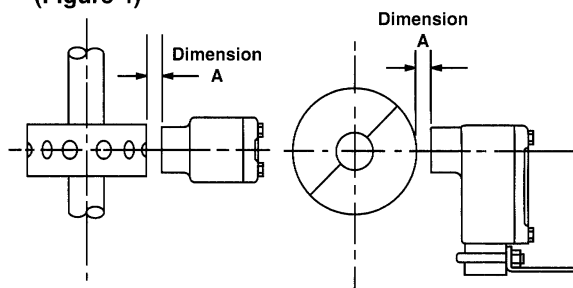
**Explosionproof Sensor and Disc (Figure 3)**



**Standard Sensor and Wrap (Figure 2)**



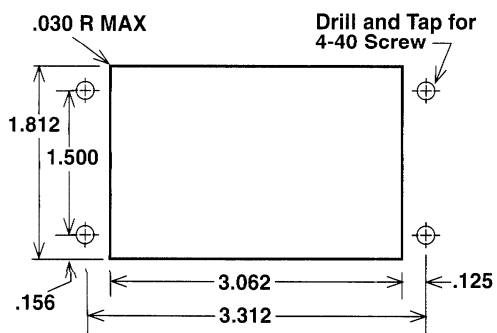
**Explosionproof Sensor and Wrap (Figure 4)**



**Meter Installation:**

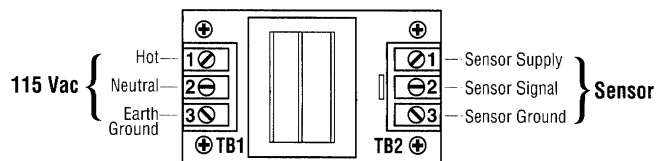
Figure 5 illustrates the cutout necessary for installation of the digital meter in the panel. Four #4-40 flathead screws are provided to secure the meter to the panel. The front bezel snaps off to allow access to the screw holes.

Figure 5



**Wiring Connections:**

Figure 6



**Sensor Connections:**

Sensor connections are made via terminal strip TB2. Refer to the table below for the proper connections.

Terminal	Description	Sensor Model 906-907	All Other ESI Sensor Models
TB2-1	Supply	Red	Red
TB2-2	Signal	Black	Clear
TB2-3	Ground	Clear/Shield	Black/Shield

**Input Power:**

Connections for input power are made via terminal strip TB1. Refer to the table below for the proper connections.

115 Vac (standard)		230 Vac (optional)	
Hot	TB1-1	Hot	TB1-1
Neutral	TB1-2	Hot	TB1-2
Chassis Ground	TB1-3	Chassis Ground	TB1-3

12 Vdc and 12 Vdc (optional)		24 Vac and 12 Vac (optional)	
Positive (+)	TB1-1	High	TB1-1
Negative (-)	TB1-2	Low	TB1-2
Chassis Ground	TB1-3	Chassis Ground	TB1-3

**Troubleshooting Guide:**

Problem:	Possible Solutions:
1. No Display , or Displays 000	Is Power Present on TB1-1 and TB1-2?
2. No Rate Indication	Check Sensor Gap and Alignment Check Proper Wiring for Sensor Type

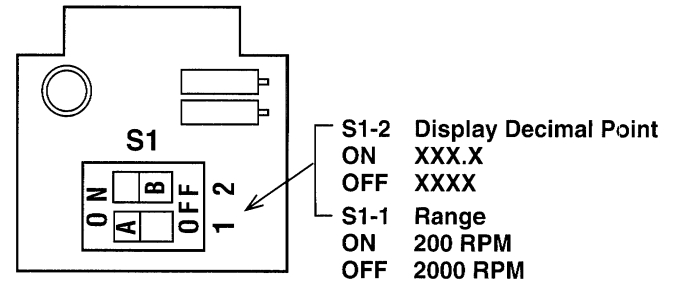
**Meter Calibration:**

Model DD106T may be ordered with factory calibration for RPM or any desired rate display. The following procedure is for field calibration, if necessary:

Meters may be calibrated in the 0 – 200 rpm range or the 0 – 2000 rpm range. To set the range, the printed circuit card #535-0004, must be removed from the enclosure. The range is selected by use of switch S1-1 (See figure 7). With the S1-1 switch in the ON position, the speed range is set for 0 – 200 rpm. When the switch is moved to the OFF position, the speed range is set for 0-2000 rpm.

A decimal point may be inserted in the display (tenths only), by placing switch S1-2 in the ON position. when the switch is in the OFF position, no decimal point will appear.

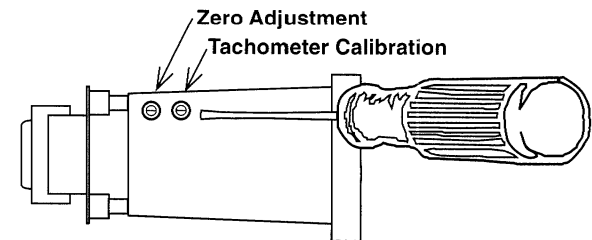
**Figure 7**



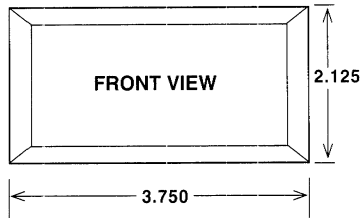
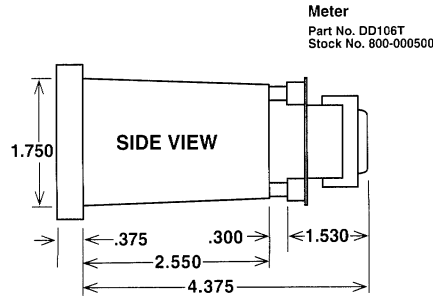
**Adjustments:**

With the monitored shaft stopped and 115 Vac applied, adjust the Zero Adjust Pot (see figure 8) for a meter reading of zero. After adjusting the Zero Adjust Pot, run the monitored shaft at a known RPM operating speed and adjust the Tach Calibration Pot (see figure 8), for a meter reading of the known shaft speed. It is recommended to repeat the the preceding procedure to obtain zero speed and operating speed ranges, since there is interaction between the Zero and Gain Adjustments.

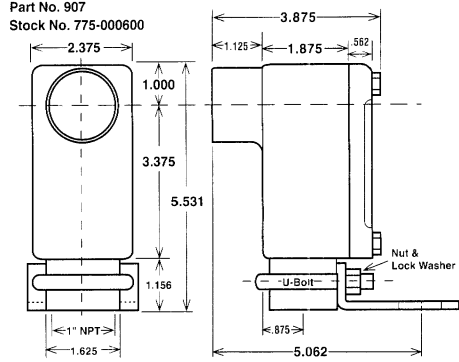
**Figure 8**



**Dimensional Drawings:**  
Dimensions in Inches

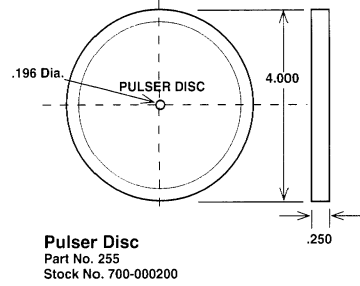
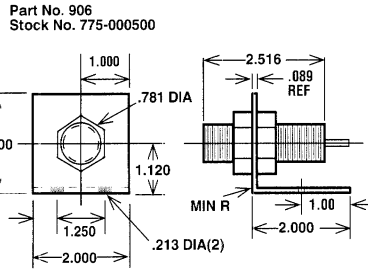


**Explosionproof Sensor**



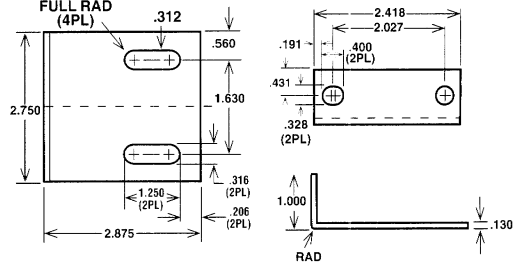
\*Sensing Head Dimensions are ±.062

**Digital Sensing Head**



**Pulser Disc**  
Part No. 255  
Stock No. 700-000200

**Mounting Bracket**



**General Specifications:**

**Input Power:**

Standard	115 Vac, ±10%
Optional	230 Vac, 24 Vac, 12 Vac, 12 Vdc, 24 Vdc
Frequency	50 – 60 Hz
Wattage	2.4 VA

**Input Signal:**

Type	Open Collector/Logic
Input Impedance	2200 Ohms
Nominal Amplitude	8 Volts
Minimum Amplitude	3 Volts
Maximum Frequency	266.67 Hz
Minimum Pulse Width	250 µsec

**Output:**

Sensor Supply	8 Vdc, 50 mA maximum
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**Electrical Connections:**

Barrier Strip	Screw-Type with wire clamping plate
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**Display:**

Type	Segmented LED .43-inch character height
Resolution	3-1/2 Digits (1999)
Accuracy	± .1% or ± count

**Physical Environmental:**

Enclosure Material	Noryl 225
Dimensions	2-1/8 inch height, x 3-3/4 inch wide, x 4-3/4 inch deep
Mounting Type	Panel Mount
Operating Temperature	0°C to +70°C
Storage Temperature	-40°C to +60°C
Shipping Weight	2 lb

**Pulser Disc:**

Material	Nylon Standard, Aluminum Optional
Dimensions	4-inch diameter x 1/4-inch thick
Operating Temperature	-40°C to +60°C
Maximum Speed Range	Consult Factory

**Pulser Wrap:**

Material	PVC (standard)
Dimensions	O.D. = shaft I.D. +3.00-inch x 1.500-inch width
Operating Temperature	-40°C to +60°C
Maximum Speed	Consult Factory

**Standard Sensor:**

Material—Sensor Body	Aluminum
Sensor Mounting Bracket	Steel
Thread Size—Standard Sensor	3/4-16UNF
Output Type	Open Collector, current sinking 20mA max.
Signal Cable	3-Conductor shielded, 10 feet supplied
Operating Temperature	-40°C to +60°C*
Sensing Distance between Sensor and Disc	1/16-inch to 1/4-inch

**Optional Explosionproof Sensor:**

Signal Cable	3-conductor shielded, 10-feet supplied
Housing and Cover	Cast Aluminum, C.S.A. approved U.L.® rated: Class I Group D, Class II Group E, F, G, Class III.

\*Higher Temperature Ranges Available Consult Factory

Specifications Subject to Change Without Notice

**DD106T Spare Parts List:**

Description	Part No.	Stock No.
Meter Only	DD106T	800-000500
Standard Digital Sensing Head	906	775-000500
XP Sensing Head	907	775-000600
Pulser Disc (Nylon)	255	700-000200
Pulser Disc (Aluminum)	255-A	700-001500
Pulser Wraps		Consult Factory

**CALL TOLL FREE FOR MORE INFORMATION**

**ELECTRO SENSORS** Electro-Sensors®, Inc.  
6111 Blue Circle Drive • Minnetonka, MN • 55343 USA

**1-800-328-6170**

IN MINNESOTA: 612/930-0100  
FAX. NO. 612/930-0130