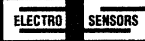
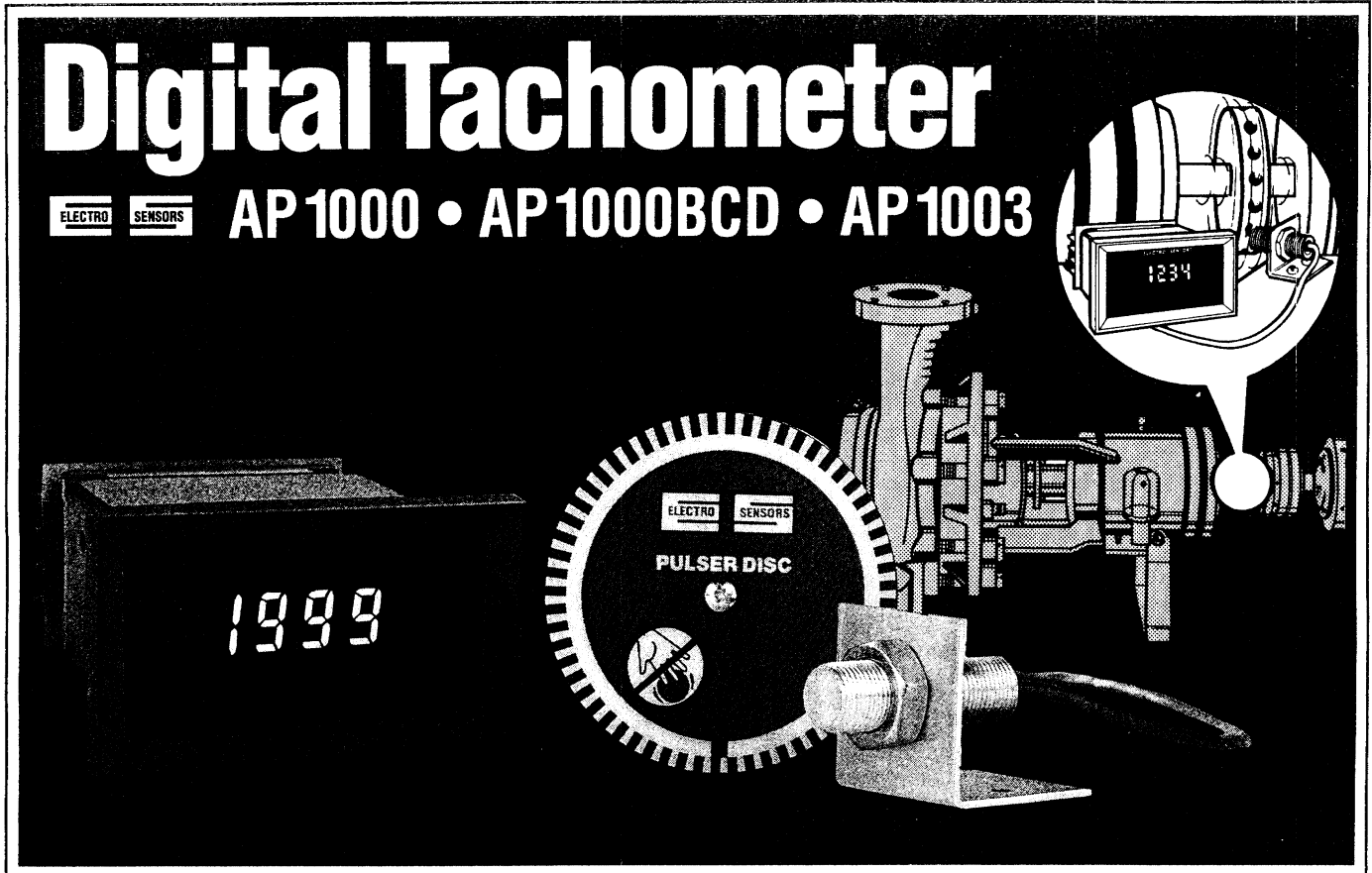


Digital Tachometer



AP 1000 • AP 1000BCD • AP 1003



Features:

- ▶ **Highly Accurate**
- ▶ **Simple Installation**
- ▶ **Complete System Including Transducer**
- ▶ **Choice Standard of Ranges:**
.25 to 39.99, 2.5 to 399.9, 25 to 3999
- ▶ **High Speed Model AP1003: 25 to 10,000 RPM**
- ▶ **Parallel BCD (Tristate) Output Model AP1000BCD**
- ▶ **Bright .43" High Efficiency LED Displays**
- ▶ **Panel Mount Meter**

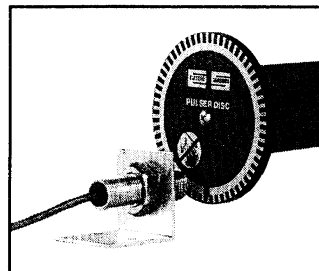
Description:

The AP1000 series digital tachometer systems combine accuracy and reliability in a rugged, compact housing. Each tachometer system includes a pulser disc (or wrap) to be mounted on the monitored shaft, a digital sensor and mounting bracket, and a panel mount display with a built-in power supply. Standard input power is 115Vac; 230 or 12 Vac and 12 or 24Vdc are optional. The AP1000, because of its flexibility, can be used in a wide variety of monitoring and process control applications.

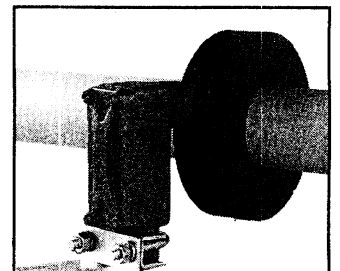
The AP1000 has three speed ranges. The desired range is selected using DIP switches. The slow speed range provides a readout from 0.25 to 39.99 RPM; accuracy is to a hundredth of an RPM. The intermediate speed range is from 2.5 to 399.9 RPM; accuracy is to tenths of an RPM. The high speed range provides a readout from 25 to 3999 RPM. The AP1003 is used in high speed applications that require a readout from 25 to 10,000 RPM. The model AP1000BCD features a Parallel BCD (Tristate) output.

Principle of Operation:

A pulser disc (or pulser wrap) is mounted on the monitored shaft. As the magnetic targets on the pulser disc (or wrap) rotate in front of the Hall Effect sensor, a digital signal is transmitted to the AP1000's electronics. This signal has a frequency proportional to the rotational speed of the monitored shaft. The AP1000 translates this signal into RPM (or any programmed user unit, such as FPM or GPM) and displays it on the front panel LEDs.



Standard Sensor and Pulser Disc



Optional Explosion Proof Sensor and Optional Pulser Wrap

Pulser Disc

To mount the Pulser Disc, center drill the monitored shaft to a depth of 1/2" with a No. 21 drill and tap it for a 10/32UNF screw. Apply Loctite™, or a similar adhesive, on the screw threads to keep the Pulser Disc tight. Attach the disc, decal side out, with the 10/32UNF machine screw provided. Pulser Discs can be used with all E.S.I. sensors.

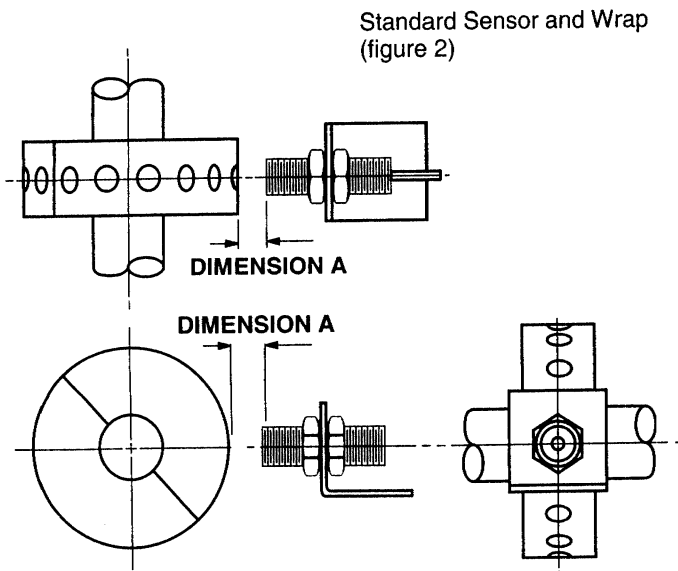
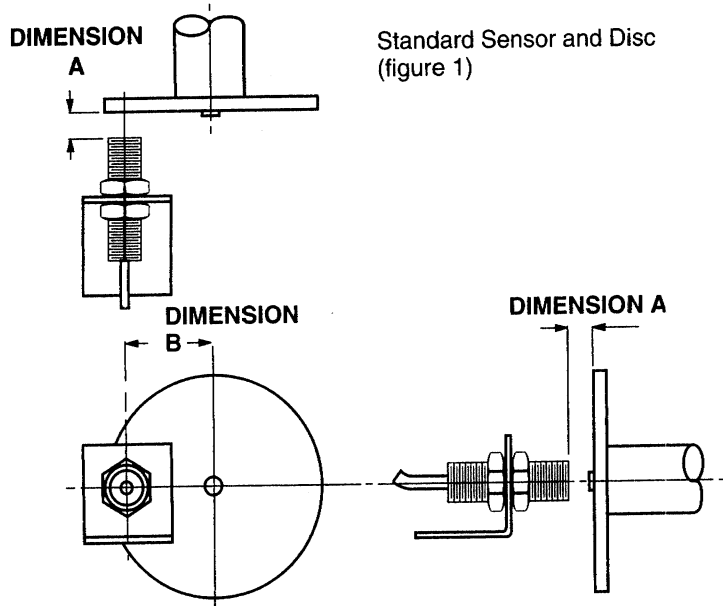
Pulser Wrap (optional)

Pulser Wraps are custom manufactured to fit the specific diameter of the shaft on which they will be mounted. To mount the Pulser Wrap, remove the 4 allen-head cap screws holding the halves of the wrap together, place the halves around the shaft, and reinsert the screws. Tighten the screws to 8 ft. lbs. Pulser Wraps can be used with all E.S.I. sensors.

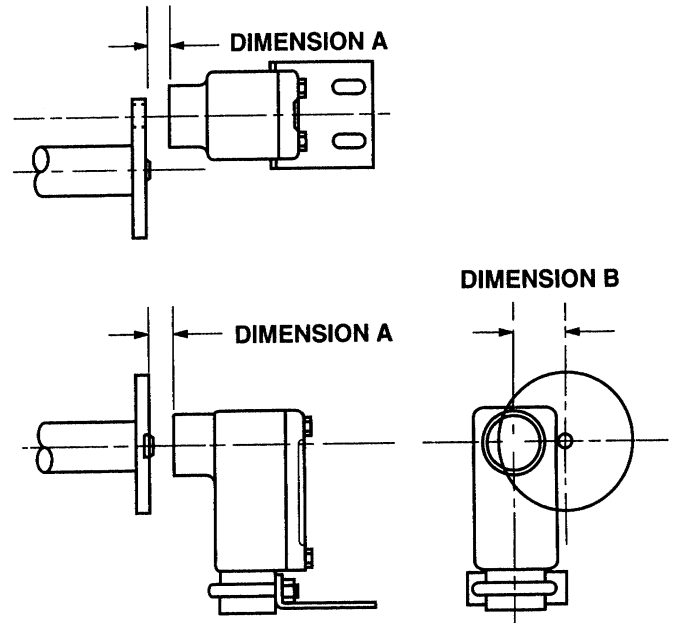
Transducer Installation:

The standard sensor is supplied with a mounting bracket and two jam nuts. The explosion-proof 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.

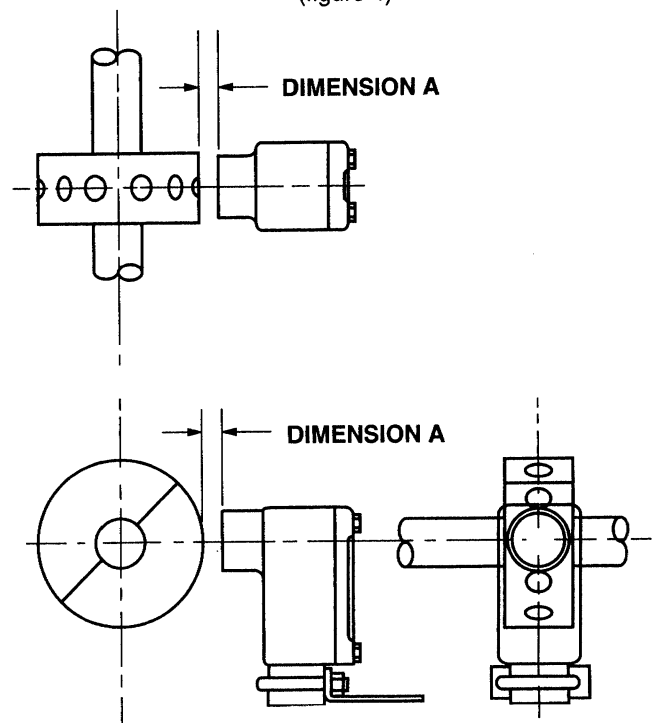
The gap distance between the sensor and the disc (or wrap), Dimension A in the diagrams, can be from 1/16" to 1/4". To achieve the proper gap distance, adjust the jam nuts holding the standard sensor in the mounting bracket, or adjust the position of the explosion proof sensor using the slots on its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



Explosion Proof Sensor and Disc (figure 3)



Explosion Proof Sensor and Wrap (figure 4)

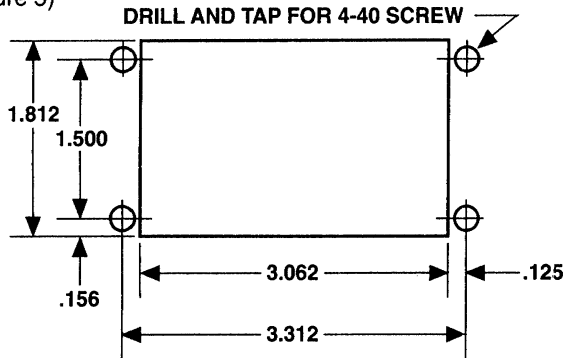


Electro-Sensors Digital Tachometer, AP1000

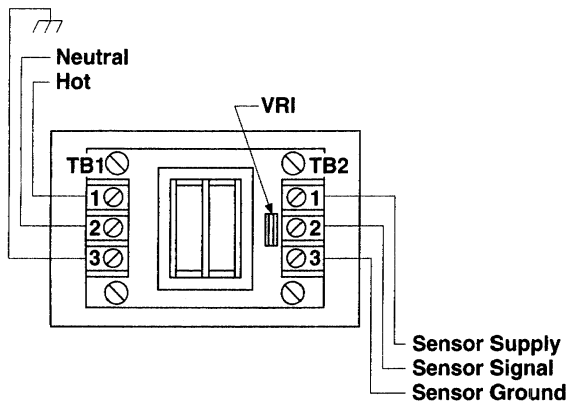
Meter Installation:

Figure 5 shows the cutout for installation of the AP1000 meter in a panel. Four #4-40 flathead screws are provided to secure the meter to the panel. The front bezel of the AP1000 comes off to allow access to the screw holes. To remove the bezel, gently pry the frame upward while pulling it off.

Cutout for Panel Mounting
(figure 5)



Wiring Connection Diagram:
(figure 6)



Sensor Connections:

Sensor connections are made on terminal strip TB2 (see figure 6). Refer to the table below for the proper connections.

Terminal	Description	Sensor Model 906-907-909	Sensor Model 930-931-1101-1102
TB2-1	Supply	Red	Red
TB2-2	Signal	Black	Clear
TB2-3	Ground	Clear/Shield	Black/Shield

Input Power:

Input power connections are made on terminal strip TB1 (see figure 6). Refer to the table below for the proper connections.

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

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

Display Calibration (Standard and Custom):

The AP1000 series tachometers are factory calibrated to display shaft speed in RPM using the a pulser disc (or wrap) and a Hall Effect sensor. Inform Electro-Sensors if other sensing systems are used so the AP1000 can be calibrated accordingly.

The AP1000 series meters can be factory calibrated to display speed in units other than RPM. To calibrate for other units, Electro-Sensors must receive information needed to convert RPM to the desired display. Examples: If the desired display is FPM (feet per minute), Electro-Sensors must know the diameter (or circumference) of the monitored shaft (usually a roller). If the desired display is GPM (gallons per minute), the information to be provided is the number of gallons per revolution. Electro-Sensors' Application Specialists can help determine what information is needed for custom displays. Supply display information when the AP1000 is ordered.

AP1000 Speed Range Selection:

Remove the front bezel of the AP1000 and the red filter to expose the DIP switches used to select the operating speed range. To remove the bezel, gently pry the frame of the bezel up while pulling forward. The DIP switches are located on the display board in the upper right corner of the meter. Select a range by placing the DIP switches in the positions shown in the table below. The "ON" position is up. Remove and reapply power to the tachometer after changing the speed range.

Speed Range	S1	S2	S3	S4
.25 to 39.99	Off	On	On	On
2.5 to 399.9	On	Off	Off	On
25 to 3999	Off	Off	On	Off

These field adjustable speed ranges do not apply to the AP1003 or any AP1000 tachometer that has been custom calibrated.

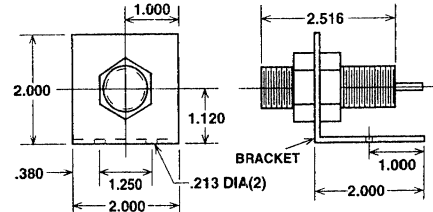
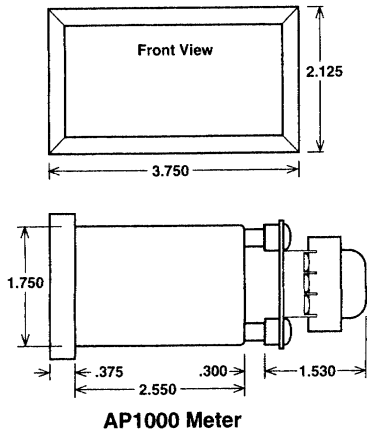
Parallel BCD Output (Model AP1000BCD):

The AP1000BCD provides Parallel BCD transmission of speed display information. The Tristate configuration of the output can be used with either TTL or CMOS external monitoring devices. A 26 pin connector with one foot of ribbon cable is provided for wiring. The chart below shows the pin designations on the connector.

Pin Designation	Function
J3-1 to J3-5	No Connection
J3-6	Sample Inhibit
J3-7	System Ground
J3-8	Sample Inhibit (Low Active)
J3-9	Output Enable
J3-10	Output Enable (Low Active)

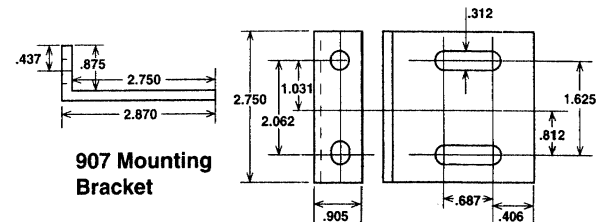
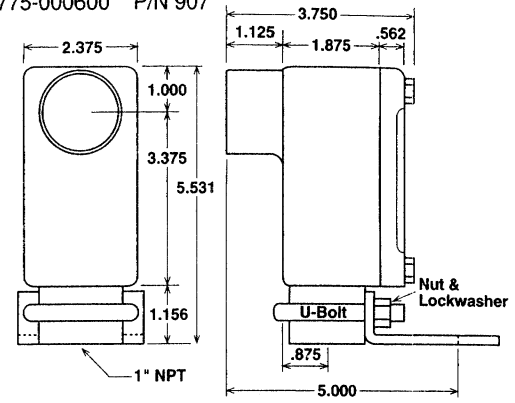
Pin #	Digit	Pin #	Digit
J3-11	10	J3-19	1000
J3-12	20	J3-20	2000
J3-13	40	J3-21	4000
J3-14	80	J3-22	8000
J3-15	800	J3-23	8
J3-16	400	J3-24	4
J3-17	200	J3-25	2
J3-18	100	J3-26	1

AP1000 Dimensional Drawings
Dimensions in Inches



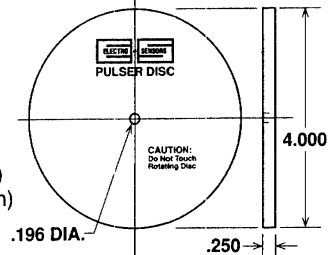
Standard Digital Sensing Head
S/N 775-000500 P/N 906

Explosion Proof Sensing Head
S/N 775-000600 P/N 907



907 Mounting Bracket

End of Shaft Pulsar Disc
S/N 700-000200 (Nylon 12)
S/N 700-001500 (Aluminum)
P/N 255 P/N 255-A



AP1000 General Specifications

Input Power:
Standard 115Vac ±10%
Optional 230Vac, 24Vac, 12Vac, 24Vdc, 12Vdc
Frequency 50-60 Hz
Wattage 2.4VA

Input Signal: *DC Current Draw ≈ 200mA*
Type Open Collector/Logic
Input Impedance 2200 Ohms
Nominal Amplitude 5 Volts
Minimum Amplitude 3 Volts
Maximum Frequency AP1000, AP1000BCD
Low Range 5.33 Hz
Intermediate Range 53.33 Hz
High Range 533.33 Hz
AP1003 (High Speed) 4368 Hz
Minimum Pulse Width 1.5 µsec.

Output:
Transducer Supply 8Vdc, 50mA max.

Electrical Connections:
Barrier Strip Screw type with wire clamping plate

Display:
Type43" height segmented LED
Resolution AP1000,
AP1000BCD 3 3/4 digits (3999)
AP1003 4 1/2 digit (19999)
Accuracy ±1 digit

Physical/Environmental:
Enclosure Material Noryl 255
Operating Temperature 0° to 70°C*
Storage Temperature -65° to 70°C

Pulsar Disc:
Material AP1000, AP1000BCD - Nylon 12 (std.)
Aluminum (optional)
AP1003 - Aluminum (standard)
Dimensions 4" diameter x 1/4" thick
Operating Temperature -40° to 60°C*
Maximum Speed Range Consult Factory

Pulsar Wrap:
Material PVC Standard,
Others - Consult Factory
Dimensions I.D. (shaft diameter) + 3" = O.D., 1.5" thick
Operating Temperature -40° to 60°C*
Maximum Speed Range Consult Factory

Sensor:
Sensor Body Material Aluminum
Mounting Bracket Material Steel
Sensor Threading 3/4-16 UNF
Output Type Open Collector, Current Sinking, 20mA max.
Signal Cable 3 Conductor shielded, 10' supplied
Operating Temperature -40° to 60°C*
Sensing Distance from
Sensor to Pulsar Disc 1/16" to 1/4"

Optional Explosion Proof Sensor:
Housing and Cover Cast aluminum, C.S.A. Approved;
UL® rated: Class I Group D; Class II
Group E,F,G; Class III.
Signal Cable 3 Conductor shielded, 10' supplied

Parallel BCD (Tristate):
Output (TTL Standard) LPTTL 2 Loads
Output (CMOS Standard) CMOS Compatible
Output Format 16 Bit (four digit)
Output Enable High or Low Active
Sample Inhibit High or Low Active

* Higher Temperature Ranges Available. Consult Factory.

Specifications Subject to Change Without Notice.

AP1000 Spare Parts List:

Pulsar Disc (Nylon 12)	P/N 255	S/N700-000200
Pulsar Disc (Aluminum)	P/N 255-A	S/N700-001500
Standard Digital Sensor	P/N 906	S/N775-000500
Explosion Proof Sensor	P/N 907	S/N775-000600
AP1000 Meter		S/N800-003900
AP1003 Meter		S/N800-003901
AP1000BCD Meter		S/N800-003902
Sensor Cable	P/N213-A	S/N610-000200
Pulsar Wraps		Consult Factory

CALL FOR APPLICATION SPECIALIST

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