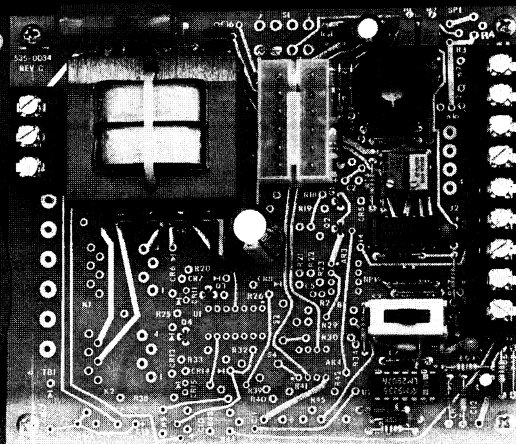


Signal Conditioner

ELECTRO SENSORS DSC-10C



Converts Shaft Speed to Dual Analog Outputs

Features:

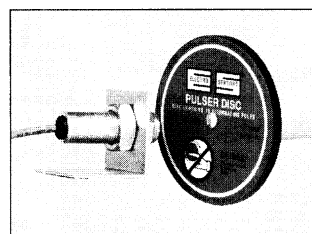
- 0 – 10 Vdc and 4 – 20 mA Outputs
- Switch Selectable Speed Ranges
- Non-Contact Sensor System
- Low Power Consumption
- Simple Installation and Set Up
- Terminal Strip Wiring

Description:

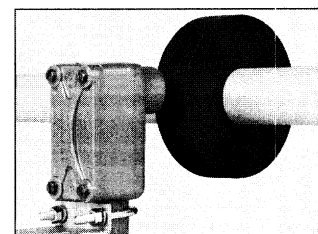
The Electro-Sensors' DSC-10C Signal Conditioner measures a pulse input frequency and converts it to an analog 0–10 Vdc and 4–20 mA output proportional to a machine or process speed. This output can be sent to a chart recorder, digital display, PLC, loop controller, drive speed controller, or other control or monitoring device.

The DSC-10C is provided as a complete system which includes the chassis mounted circuitry, a Hall Effect sensor with an adjustable mounting bracket, 10 feet of three-conductor shielded cable, and an end of shaft mount magnetic pulser disc.

The monitored shaft rotates with a pulser disc, or optional pulser wrap attached to it. When the alternating magnetic fields on the disc or wrap pass in front of the Hall Effect sensor, a digital signal proportional to the speed of the shaft is transmitted to the Signal Conditioner. The DSC-10C Signal Conditioner circuitry converts this signal to a 0–10 Vdc and 4–20 mA output directly proportional to the speed of the monitored shaft. Simple field adjustments are made to properly tune the span of the analog signals to the operating speed range of the monitored shaft.



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):

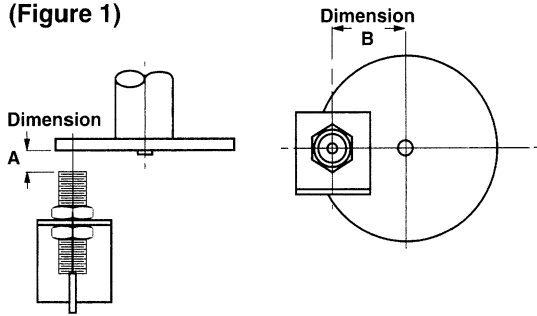
Pulser Wraps are custom manufactured to fit the shaft they will be mounted on. When the wrap is shipped, four Allen head cap screws hold the two halves of the wrap together. These screws must be removed so that the wrap is in two halves. Place the halves around the shaft, reinsert the screws and torque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

Sensor Installation:

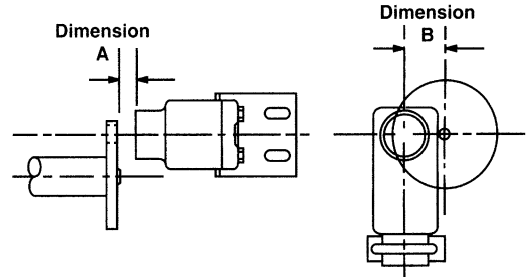
The standard sensor is supplied with a mounting bracket and two jam nuts. The explosionproof sensor is supplied with a slotted mounting bracket. Sensors should be installed so the center line of the magnets pass in front of the center of the sensor as the disc or wrap rotates. When using the pulser disc, 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.

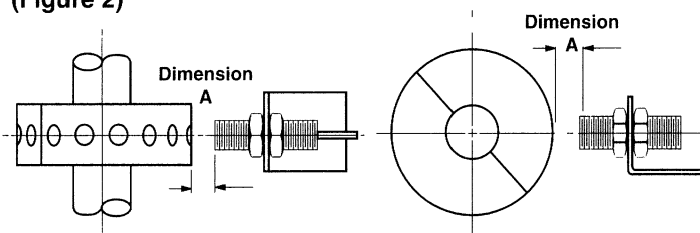
Standard Sensor and Disc (Figure 1)



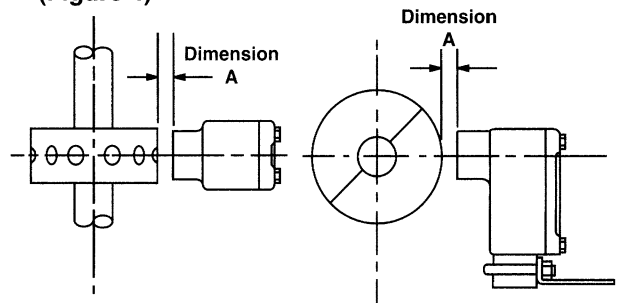
Explosionproof Sensor and Disc (Figure 3)



Standard Sensor and Wrap (Figure 2)



Explosionproof Sensor and Wrap (Figure 4)



Wiring Connections:

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

Sensor Wire Connections:

Terminal	Description	Sensor Model 906 - 907	All Other Sensor Models
TB2-7	Supply	Red	Red
TB2-8	Signal	Black	Clear
TB2-9	Ground	Clear/Shield	Black/Shield

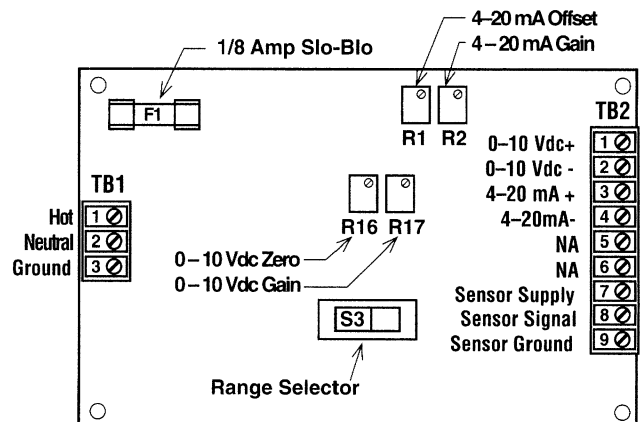
Input Power Connections:

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

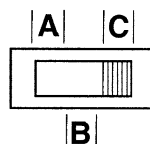
24 Vdc (optional)		24 Vac (optional)	
Positive (+)	TB1-1	High	TB1-1
Negative (-)	TB1-2	Low	TB1-2
Chassis Ground	TB1-3	Chassis Ground	TB1-3

Wiring Diagram

Figure 5



S3 Selector



RPM	S3 Pos.
0-10000	A
0-2000	B
0-200	C

Calibration:

Refer to figure 5 for all potentiometer positions and wiring connections.

Note: Please specify the actual operating RPM of the monitored shaft when ordering.

0–10 Vdc:

To calibrate this system accurately, a device with a visual display of RPM or voltage must be used. If a meter is not ordered with the system, a voltmeter set to the 10 Vdc range may be used. Connect The voltmeter to the 0–10 Vdc output terminals on TB2; polarity as follows: TB2-1 is positive, TB2-2 is negative. The unit can be calibrated using full meter deflection as 100% maximum operating speed.

Connect 115 Vac power to the TB1 terminals. With the monitored system OFF, place the Range Selector Switch (S3 in figure 5) in the position corresponding to the maximum RPM range of the monitored shaft (see figure B for position information). Turn the 0–10 Vdc Zero Adjustment Pot (R16) CCW to decrease the reading, or CW to increase the reading, until a zero reading is displayed.

Run the monitored shaft at maximum operating speed. Turn the 0–10 Vdc Gain Adjustment Pot (R17) CW to increase, or CCW to decrease, until the reading is 10 Vdc. The lowest recommended maximum speed i.e. 10 Vdc, is 70 rpm.

Note: The process should be repeated to ensure accuracy, because there is interaction between the zero and gain potentiometers.

Calibrating the 4-20mA Output:

To calibrate the 4-20 mA output, connect a milliammeter to the 4-20 mA outputs. Be sure to maintain proper polarity. TB2-3 is positive, TB2-4 is negative.

Apply 115 Vac power to the DSC-10C. With the monitored system OFF, place the Range Selector Switch (S3 in figure 5) in the position corresponding to the full RPM range of the monitored shaft (see figure B for position information). Set the offset level to 4 mA by turning the 4-20 mA Offset Adjustment (R1). Turn CCW to decrease, CW to increase.

Run the monitored shaft at full speed. Adjust the output to 20 mA using the 4-20 mA Gain Adjustment (R2). Turn CW to increase, CCW to decrease. The lowest recommended maximum speed, i.e. 20 mA is 70 rpm.

Note: This process should be repeated to ensure accuracy, because there is interaction between the offset and gain potentiometers.

Troubleshooting Guide:

Problem:	Possible Solutions:
No 0–10 Vdc or 4–20 mA Output	1. Is Power Present on TB1-1 and TB1-2? 2. Check Fuse "F1" 3. Check Sensor Supply "Approx. 13.6 Vdc" on TB1-9 and TB1-12 4. Check Square Wave Frequency Input on TB1-9 and TB1-11 "Approx. 13.6 Vdc Square Wave" 5. If No Frequency is Present, Check Sensor Alignment and Gap

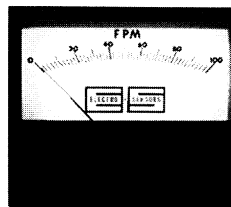
Digital or Analog Meter (Optional):

Note: When purchasing an analog or digital meter, supplemental literature with Installation Instructions will be provided. Use the following meter calibration instructions instead of the normal Calibration Instructions.

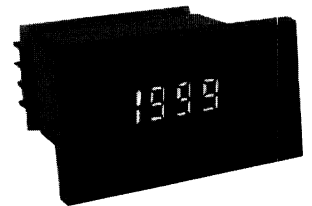
The optional meters are used to display shaft speed. Calibration procedures when using the meters are different than the normal calibration procedure, because the voltage output is used to generate the desired reading on the display, not to generate a precise 0–10 Vdc output.

To use the digital display (Model 267-A) connect 115 Vac power and the 0–10 Vdc output as shown in the supplementary literature. With the monitored shaft stopped, adjust the 0–10 Vdc Zero Potentiometer (R16) until zero (0) is displayed on the meter. Run the monitored shaft at maximum speed (this speed should be a known RPM or engineering unit value.) Adjust the 0–10 Vdc Gain Potentiometer (R17) until the display shows the value desired. Because there is interaction between the zero and gain potentiometers, repeat the process for better accuracy.

The analog meter (Model 264) does not require 115 Vac power. It is a 50-graduation taut band meter movement scaled to customer specifications. After attaching the 0–10 Vdc output (TB2-1 to meter positive, TB2-2 to meter negative) follow the digital meter calibration instructions above.

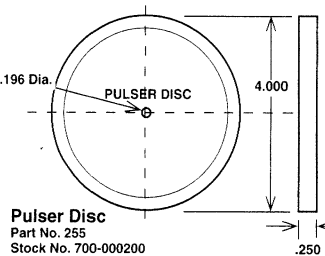
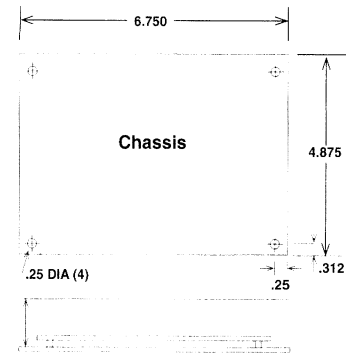


Analog Meter

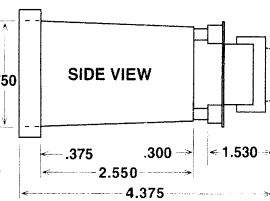
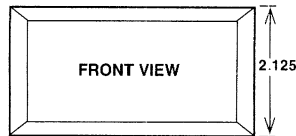


Digital Meter

DSC-10C Dimensional Drawings:
Dimensions in Inches

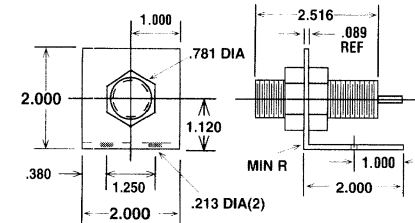


Optional Digital Meter
Part No. 267-A
Stock No. 800-000504



Digital Sensing Head

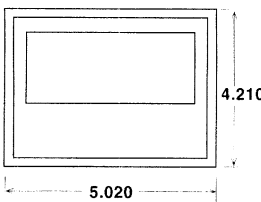
Part No. 906
Stock No. 775-000500



*Sensing Head Dimensions are ±.062

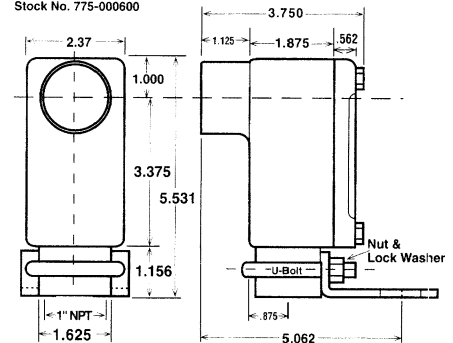
Optional Analog Meter

Part No. 264
Stock No. 510-000100



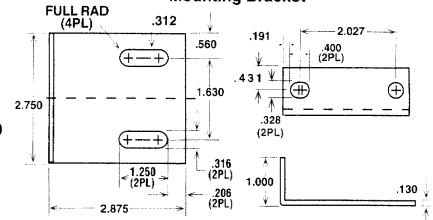
Explosionproof Sensor

Part No. 907
Stock No. 775-000600



*Sensing Head Dimensions are ±.062

Mounting Bracket



DSC-10C General Specifications:

Power:

Voltage	115 Vac ±10%, Standard, 24 Vac / Vdc, Optional 230 Vac ±10%, Optional
Frequency	50 – 60 Hz
Wattage	12 Va
Fuse	1/8 Amp slo-blo 115 Vac 1/16 Amp slo-blo 230 Vac

Input Signal:

Type	Open Collector/Logic
Amplitude	15 Volts nominal, 8 Volts minimum
Impedance	2200 Ohms to 15 Vdc
Frequency	9.33 Hz Minimum 2.666 KHz Maximum
Duty Cycle	50% required for Linear Output
Transducer Supply	+15 Vdc, 50 mA maximum

Output Signal:

Type	4–20 mA; 0-10 Vdc, Standard 10–50 mA, Optional
Load	500 Ohms maximum
Accuracy	± .5% at Midrange
Calibration	3 Gross Speed Ranges (Switchable): 0–200 rpm 0–2000 rpm 0–10,000 rpm Offset and Gain Adjustments for Outputs – 22-Turn Potentiometers
Response Time	Approx. 3-Sec. for 10% – 90% step
Minimum Full Scale RPM	70 at 8 PPR

Physical/Environmental:

Mounting	PVC Chassis
Operating Temperature	0°C to +60°C
Storage Temperature	-20°C to +65°C

Electrical Connections	Terminal Strip
Shipping Weight (System)	2 lb

Pulsar Disc:

Material	Nylon® 12, Standard
Dimensions	4 inch Diameter x 1/4-inch Thick
Operating Temperature	-40°C to +60°C*
Maximum Speed Range	Consult Factory

Sensor:

Material (Sensor Body)	Aluminum
Material (Mounting Bracket)	Steel
Thread Size (Stan. Sensor)	3/4-16 UNF
Output Type	Open Collector, Current Sinking, 20mA Maximum
Signal Cable	3-Conductor Shielded, 10-feet Supplied
Maximum Cable Length	1500-Feet
Operating Temperature	-40°C to +60°C*
Air Gap	1/16 inch to 1/4 inch

Optional Explosionproof Sensor:

Signal Cable	3-Conductor Shield, 10-feet Included
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

Spare Parts List	Stock No.	Part No.
Pulsar Disc (Nylon 12)	700-000200	255
Pulsar Disc (Aluminum)	700-001500	255A
Standard Digital Sensing Head	775-000500	906
XP Digital Sensing Head	775-000600	907
DSC -10C Circuit Board	878-000100	935
Pulsar Wraps	Consult Factory	
Sensor Cable	610-000200	213-A
Male Conduit Adapter for Sensor	271-000100	259-M
NEMA 4 Enclosure	285-000100	
NEMA 12 Enclosure	287-000300	

CALL TOLL FREE FOR MORE INFORMATION

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95-800-328-6170 MEXICO
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FAX. NO. 612/930-0130

Specifications Subject to Change Without Notice.