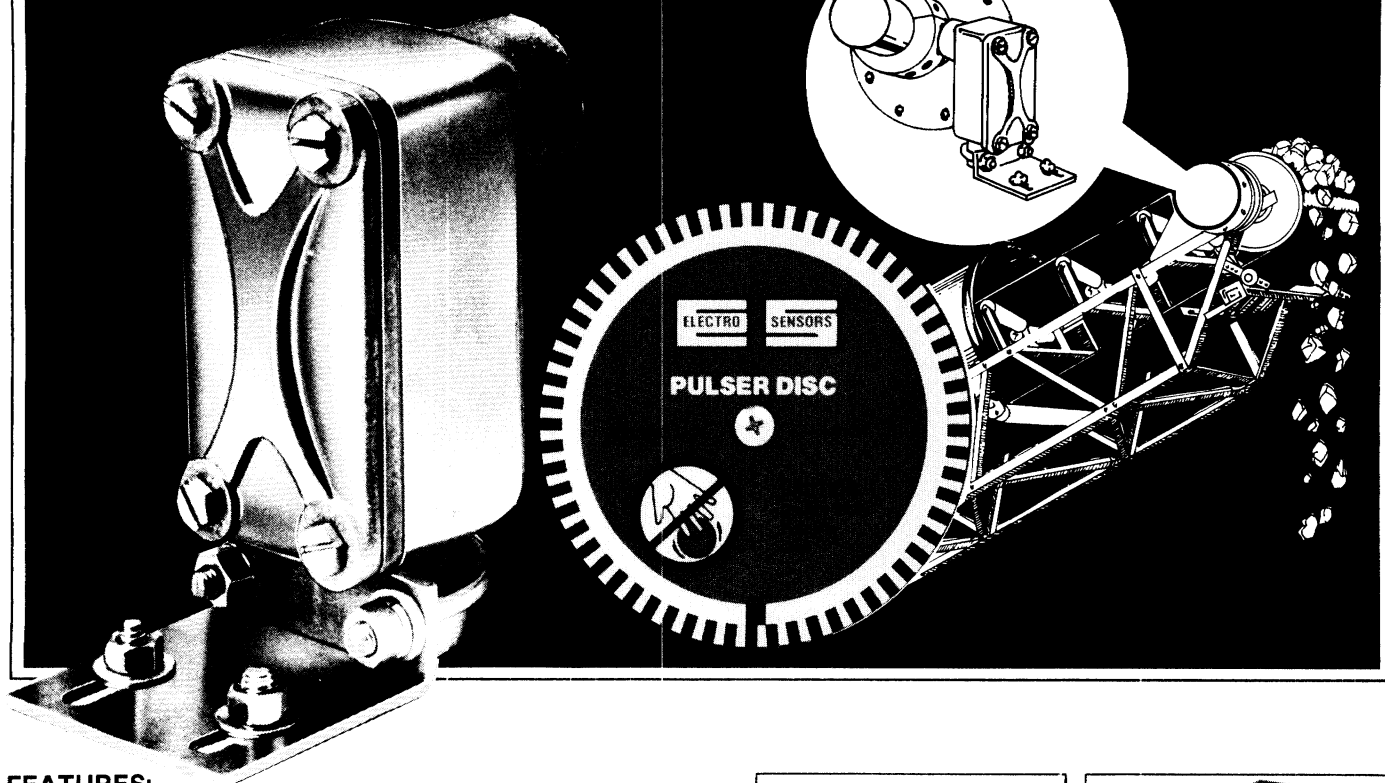


Shaft Reversal Detector

ELECTRO SENSORS

D100



FEATURES:

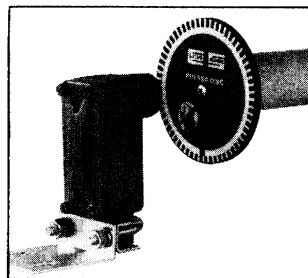
- Easy Installation**
- Dust, Dirt, Grease Proof**
- Cast Aluminum XP Housing**
- Fail-Safe Wiring**
- Optional Split Collar Wrap**

The D100 system provides constant monitoring of the direction of rotation of a rotating shaft. An onboard control switch allows the customer to select either a clockwise or counterclockwise rotation as the alarm mode. A change in rotation triggers a SPDT 5 Amp relay output that can be used for alarm or shutdown purposes. The reversal monitor is available in 115Vac, 12 and 24Vdc.

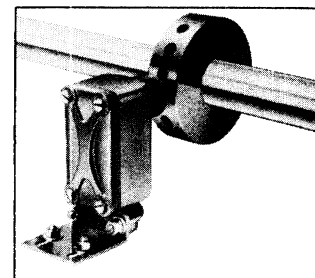
The D100 relay may also be used to interface with devices that are only effective when a shaft is turning one certain direction, such as counters during a rewind. The complete system includes a pulser disc and a sensor/controller packaged together in a cast-aluminum UL approved housing with mounting bracket.

Principle of Operation

While the monitored shaft is rotating in the proper direction, the pulser disc or wrap mounted on the shaft generates a control signal which energizes a relay inside the sensing head. If for some reason the shaft should reverse direction, the control signal de-energizes the relay. The Switch is fail-safe: any malfunction during operation will de-energize the control circuit.



Sensing head and pulser disc



Sensing head and pulser wrap (optional)

Pulser disc

The end of the shaft to be monitored must be center drilled to a depth of $\frac{1}{2}$ " 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 a 10-32UNF machine screw.

Pulser wrap (optional)

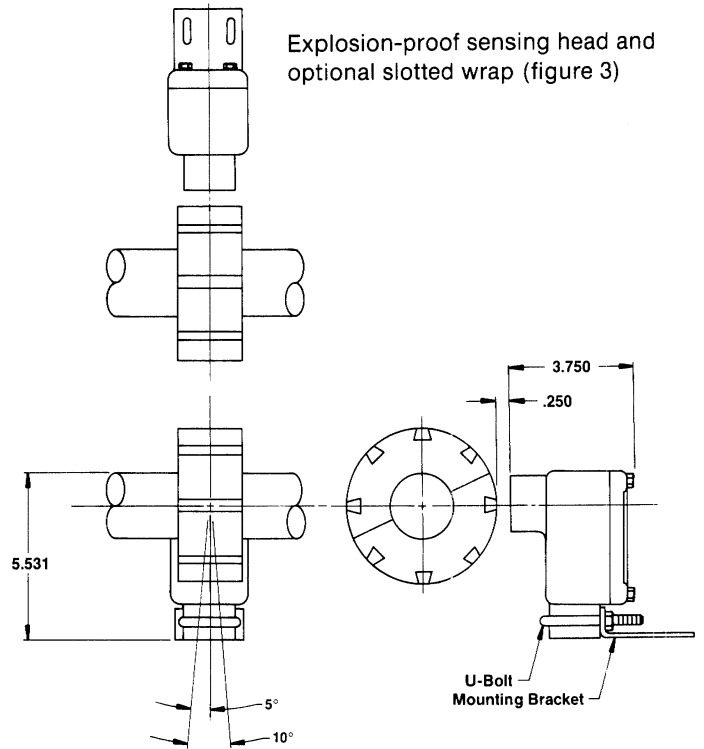
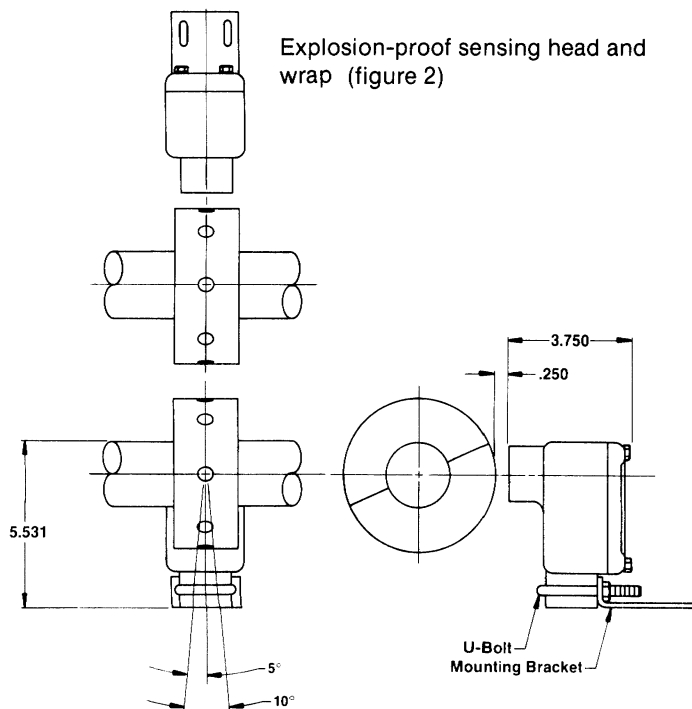
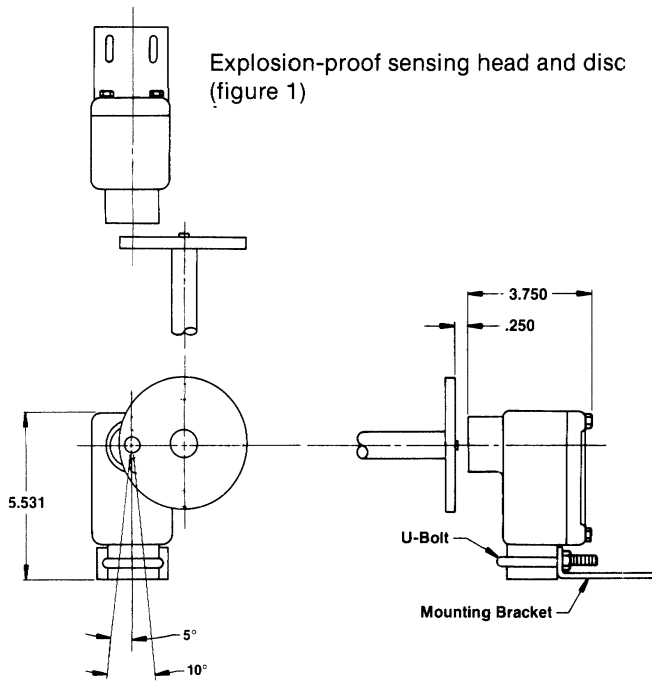
When the wrap is shipped, four allen-head cap screws hold the two halves of the wrap together. These screws must be removed so that the wrap is in two halves. Place the halves around the shaft and screw together so the wrap fits the shaft tightly. Wraps are custom made to fit a specific diameter.

Transducer Installation

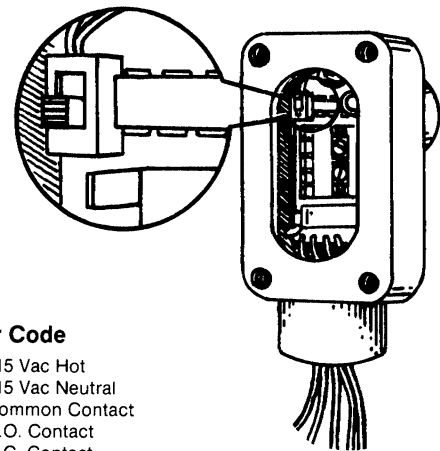
The explosion-proof transducer is supplied with a slotted mounting bracket. Transducers should be installed so the center line of the sensor passes through the center line of the magnets as they rotate.

When using a disc (figs. 1 and 3) the pick-up gap (dimension A) should be adjusted between 1/16" and 1/4" for proper operation. This is achieved by adjusting the position of the explosion-proof transducer through use of the slotted mounting bracket. Dimension B is 1 3/4" from the center hole of disc.

When using a wrap (figs. 2 and 4), dimension A must be between 1/16" and 1/4". There should be no more than a ± 5° deviation from the vertical center line.



Selector Switch Location Diagram



Lead Wire Color Code

| | |
|--------|-----------------|
| Black | 115 Vac Hot |
| White | 115 Vac Neutral |
| Yellow | Common Contact |
| Red | N.O. Contact |
| Blue | N.C. Contact |

Wiring Connections

The D100 is supplied with five color coded lead wire connections for wiring the unit into the customers circuit. Refer to the lead wire color code chart for proper lead wire description. It is recommended that the system calibration procedure be completed before the final relay connections are made.

System Calibration

It is important to complete the installation of the pulser disc or wrap before proceeding with the system calibration.

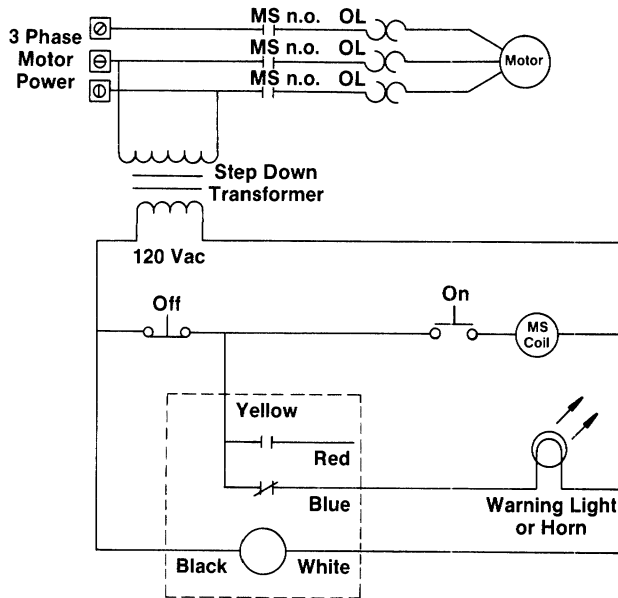
The only calibration required for the D100 is accomplished via a selector switch inside the unit. This switch is used to select which direction, clockwise or counterclockwise is the normal operating direction.

To determine the proper switch setting the following procedure may be used. (See figure 5). Remove the back cover and apply 115 Vac to the unit. With the shaft turning in the proper direction visually observe whether the LED (Light Emitting Diode) indicator is lit. If it is lit the switch is in the proper position. If it is not lit place the selector switch in the other position. Observe LED. The system is now ready for final wiring.

Wiring Diagrams

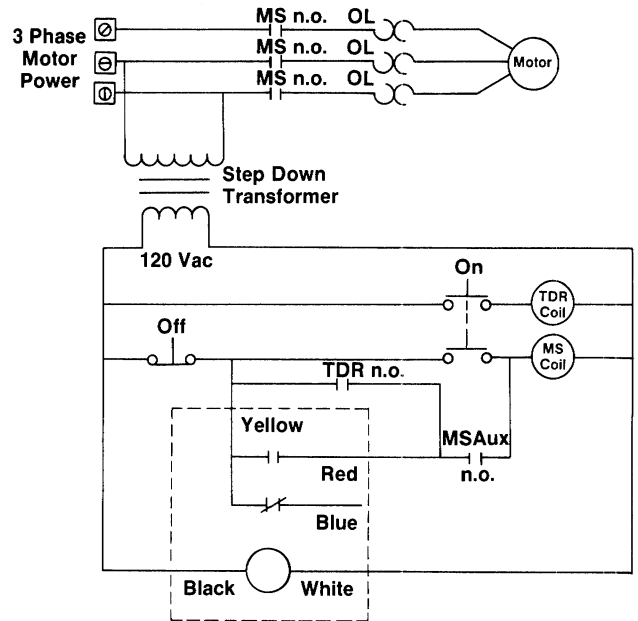
These are typical wiring diagrams. Other circuits may be used and some equipment may require different wiring.

Alarm only circuit



Shaft Reversal Detector, D100

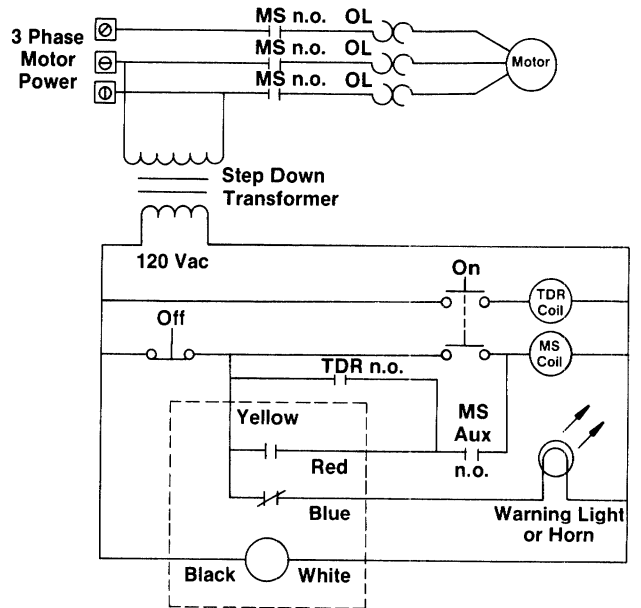
Motor shutdown control, no alarm



Shaft Reversal Detector, D100

Motor shutdown control, with alarm

This is a typical wiring diagram using the maximum capabilities of the D100.



Shaft Reversal Detector, D100

Wiring Diagram Key

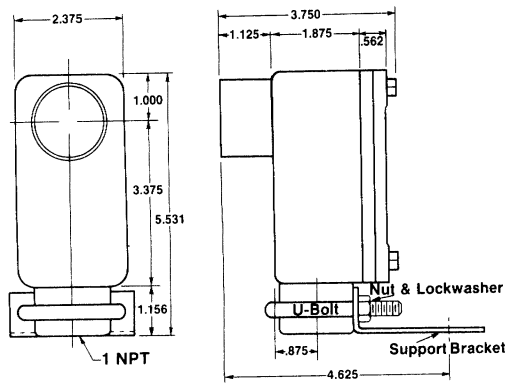
- MS Motor Starter (not supplied)
- OL Overload contacts
- n.o. Normally open (relay in its de-energized state).

WARNING

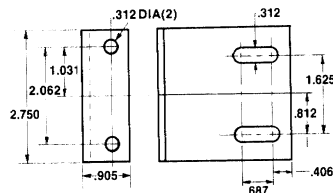
During a stopped condition, even a slight movement of the shaft or magnetic disc could energize the control relay and start the motor if the Motor Starter Auxiliary Normally Open Contact (MS Aux n.o.) is not wired in series as shown in these typical wiring diagrams. This situation could cause equipment damage or PERSONAL INJURY! To prevent starting the motor accidentally, ALWAYS USE PROPER LOCK-OUT - TAG-OUT PROCEDURES.

D100 Dimensional Drawings

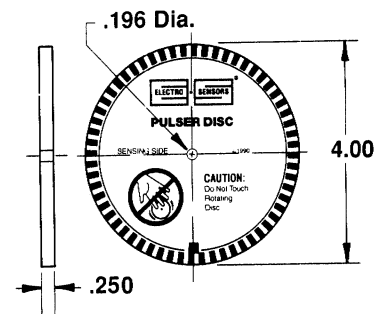
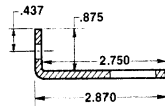
Dimensions in inches



Explosion Proof Sensing Head



Mounting Bracket



End of Shaft Pulser Disc

D100 General Specifications

Input Power:

Standard 115Vac ± 10% 50-60Hz, 3VA
 Optional 12Vdc and 24Vdc

Relay Output:

Contact Arrangement SPDT (1 Form C)
 Maximum Contact Ratings ... 5@ 115Vac, 30Vdc resistive

Transducer:

Housing and Cover Cast aluminum, C.S.A. approved, U.L. rated:
 Class I Group C,D, Class II Group E,F,G,
 Class III.

Material Transducer Steel
 Mounting Bracket Steel
 Electrical Connections Hand splice, 12" lead length
 Sensing distance between
 Transducer and Pulser Disc ... 1/16" to 1/4"

Ambient Temperature Range:

Storage Temperature -55° to 55° C
 Operating Temperature -40° to 55° C

Pulser Disc:

Material PVC (standard)
 Aluminum (optional)
 Dimensions 4" diameter X 1/4" thick
 Operating Temperature -40° to 60° C*
 Maximum Speed Range 0-5000RPM

Pulser Wrap:

Material PVC (standard)
 Aluminum (optional)
 Dimensions O.D. (Shaft O.D. +3") X 1 1/2" thick
 Operating Temperature -40° to 60° C*
 Maximum Speed Range Consult factory

*Higher temperature ranges available.

Specifications Subject to Change Without Notice

Conditional Limited Warranty

Electro-Sensors, Inc. warrants to the purchaser for one year from the date of purchase, any defect which upon our examination proves to have been caused by faulty material or workmanship. This warranty does not cover abuse, normal wear or careless handling, and it is void if the product has been repaired or serviced by personnel not authorized by Electro-Sensors, Inc. No other warranty, however, expressed or implied, on our products is authorized by us.

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