

---Instructions 1020 Series Differential Pressure Instruments

Orange Research

140 Cascade Boulevard, Milford, Connecticut 06460
orangeresearch.com 203 877-5657 800 989-5657

Indicator & Switch:

Please read all instructions carefully before attempting to install your new Orange Research instrument.

CAUTION: Do not exceed nameplate maximum operating pressure. Use only fluids compatible with wetted parts.

HOW IT WORKS

The instrument operates on the difference between two pressures (delta P). The sensing element is a spring biased diaphragm which moves linearly in proportion to the difference between two basic pressures. A magnet on the **HI** pressure side of the diaphragm assembly moves with the diaphragm and rotates a follower magnet located adjacent to the pressure cavity. The gauge pointer is located at the end of the rotary magnet shaft and rotates with the magnet to provide gauge readings proportional to differential pressure variations. There are no mechanical seals between the pressure side of the instrument and the gauge mechanism side. This is accomplished by coupling the forces between two adjacent magnets through a solid wall.

SWITCH UNITS: On indicating switch models, reed switches are located adjacent to the pressure chamber and are actuated when the diaphragm magnet field interacts at a preset point with the reed switch. Switch set points are adjustable (see below).

INSTALLATION

Check instrument and identify the **HI** and **LO** markings on the nameplate. **HI** identifies the high-pressure port; **LO** the low-pressure port. If the instrument is installed backwards, it will neither operate nor be damaged. Reverse connections if installed backwards. The instrument can be line or panel mounted.

Under normal conditions 1020DI/DIS Series Instruments are designed for line pressure to 1000 psig and can sustain a continuous 1000 psig forward or reverse overpressure regardless of the instrument measuring range.

It is recommended that the instrument be located above the pressure source to allow drainage of the unit.

IMPORTANT: Because of the magnetic movement, this instrument should never be mounted in direct contact with a steel surface; otherwise, a calibration shift will occur. Mount the instrument so that the pressure body is at least 1 inch away from metal surfaces with non-magnetic spacers or an aluminum mounting bracket. Flush panel mounted instruments will not be affected by contact with stainless steel or aluminum panels.

MAINTENANCE

Your Orange Research instrument will provide years of maintenance-free operation. Other than replacing a broken lens there is only one area where this instrument may need attention. Erratic pointer or switch action may indicate that cleaning is required. Please consult the factory for guidance on how to properly clean your instrument.

RECALIBRATION

Recalibration of this instrument is not required. However, if the range spring is damaged or a new dial is required, the instrument must be returned to the factory for the parts and recalibration.

NOTE: When ordering replacement parts, identify instrument S/N from the nameplate. Identify parts required and quantity.

SWITCH ADJUSTMENT

Reed switch set points are field adjustable. To change the reed switch setting, a source of pressure will be needed. Loosen the set screw holding the reed switch. To increase the set point, slide the switch tube toward the **LO** port. To decrease the set point, slide the switch tube toward the **HI** port. Repeat as required until new setting is reached. Tighten the screw holding the switch tube in place and recheck the new actuation point.

CAUTION: Do not over-tighten the switch holding screw – this is a cone-point set screw and digs into the tube with light pressure.

SWITCH WIRE COLOR

- A SPST white and white
- B SPST green (N/C); blue (common)
- C SPDT green (N/C); red (N/O); blue (common)

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Mini-Transmitter (-T3)

Your Orange Research transmitter is a rugged, industrial instrument featuring a simple design which affords dependable and efficient performance in many severe services and high-pressure applications. Please read all instructions and consult the wiring diagrams before attempting to install the transmitter.

CAUTION: Do not exceed the maximum operating pressures listed on the body label. Use only with fluids or gases compatible with the instrument's wetted parts.

HOW IT WORKS: Differential pressure instruments operate on the pressure difference between the high and low ports. Changes in the pressure difference will cause the transmitter's sensor/magnet assembly to move in proportion to the change.

A Hall Effect sensor and amplifier are located adjacent to the pressure cavity. As the pressure sensing magnet assembly moves with respect to pressure input, the change in position is followed and amplified as an output signal.

Indicator models incorporate a rotary magnet located in a pocket isolated from the pressure cavity. The indicator is rotated by magnetic coupling to indicate differential pressure on an easy-to-read dial.

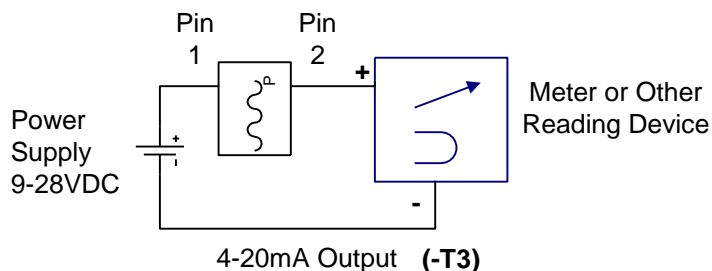
MECHANICAL INSTALLATION: Check maximum operating pressure for the model series you are using,

listed on the instrument body label. Check instrument to identify *HI* and *LO* markings identifying the high- and low-pressure ports and connect piping accordingly. The transmitter can be stored and used within the temperature limits of 0°F to 175°F. The transmitter should be installed with the gauge indicator face (if present) in a normal horizontal orientation to reduce position error. Mount the transmitter where vibration is at a minimum. Install NPT fittings with sealing tape or other non-migrating sealant on the threads prior to installation. It is recommended that the instrument be installed above the pressure source to allow drainage and removal of particulate.

See wiring diagram and transmitter connector sections for all electronic wiring connections. These instruments are reverse polarity protected to protect the board. Mating connectors are included.

IMPORTANT: *Because of its magnetic movement, these instruments should not be mounted in direct contact with a steel surface to avoid calibration shift in the dial gauge movement. Mount the instrument so that the body is at least 1" away from metal surfaces using non-magnetic spacers or an optional aluminum mounting bracket.*

WIRING DIAGRAM:



Voltage input is 9 to 28 VDC. Additional drive voltage may be necessary depending on loop resistance.

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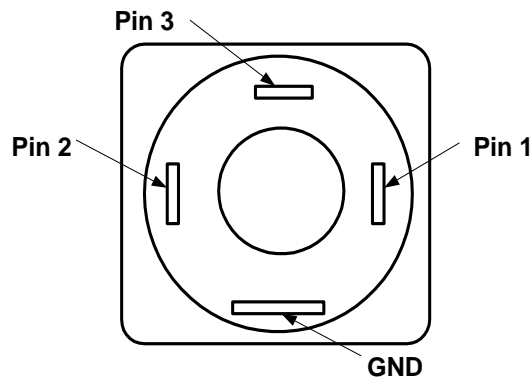
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Transmitter Connector:

Hirschmann Type GSSNR-300
EN175301-803-C Form C 8mm Male (DIN 43650)

4-20mA OUTPUT (T3)
PIN 1: V+
PIN 2: V-
PIN 3: NC
GND: NC



FRONT FACE OF CONNECTOR

Mating Connector Included:

Hirschmann Automation and Control
EN175301-803-C (DIN 43650)
Type GDSN 307 Form C
3C + Ground
Order P/N 933 023-100

When using a Shielded Cable, connect the shield drain wire to the Meter or Reading Device Ground connection.

The Mini-Transmitter is calibrated and sealed at the factory. There are no field accessible adjustments on the transmitter.