The Dwyer Series 630A Differential Pressure Transmitter converts compatible gas or liquid pressure into a standard 4-20 mA DC output signal for pressure ranges from 0-.25 to 0-300 in. w.c. Each of the models overlap in range so that any range within these pressure limits can be achieved by adjustment of the zero and span controls located on the front of the transmitter. Positive, negative or differential pressure can be measured within ±3% of full span output. The Series 630A Transmitter is based on the proven Capsubolithic gage design and uses several of its basic components. However, the 630A Transmitter eliminates the mechanical amplification achieved by the magnet/helix-pointer assembly of the indicating gage. Instead, it substitutes electrical conditioning and amplification of the resistive change produced by a silicon strain gage cemented to the range spring. This spring is deflected by the diaphragm in response to pressure. Refer to Bulletin E-50 for additional information on the design, operation and construction of the complete line of Dwyer Pressure and Temperature Transmitters.

### SERIES 630A TRANSMITTER MODELS & RANGES

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>RANGES IN INCHES OF WATER</th>
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<tbody>
<tr>
<td></td>
<td>AS Stocked</td>
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<tr>
<td>630A-1</td>
<td>0-50</td>
</tr>
<tr>
<td>630A-2</td>
<td>0-2.0</td>
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<tr>
<td>630A-3</td>
<td>0-5.0</td>
</tr>
<tr>
<td>630A-4</td>
<td>0-25</td>
</tr>
<tr>
<td>630A-5</td>
<td>0-100</td>
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### SPECIFICATIONS

**GENERAL**
- Maximum Pressure: 500 PSIG (35.15 kg/cm²)
- Media Compatibility: Air and compatible non-combustible, non-corrosive gases and liquids
- Materials: Forged brass case, acrylic cover, die cast aluminum bezel with baked dark gray hammerflop finish, silicone diaphragm

**ELECTRICAL**
- Power Supply: 13-35 VDC - 2, 3 or 4 wire
- Connections: 18-26 VAC - 4 wire
- Output Signal: 4-20 mA DC (limited at 36 mA DC)
- Loop Resistance: DC; 0-1100 ohms
- AC; 0-1130 ohms
- Warm-Up: 10 minutes
- Current Consumption: DC; 36 mA max. AC; 76 mA max.
- PERFORMANCE AT 72°F (22.2°C)
  - Zero Output: 4 mA DC
  - Full Span Output: 20 mA DC
- Accuracy: (includes linearity, hysteresis & repeatability) ±3% of full span
- Stability: 1% F.S./year

**ENVIRONMENTAL**
- Operating Temperature: 32-120°F (0-49°C)
- Thermal Errors: ±1%/50°F

**MECHANICAL**
- Weight: 8 lb., 10 oz. (3.91 kg)
- Span and Zero: Externally accessible
- Adjustments: Potentiometers
- Pressure Connections: 1/4" NPT female duplicated top and bottom

**STANDARD ACCESSORIES**
- Mounting ring, snap ring, (4) 8-32 x 1/4" round head machine screws, (2) 1/4" NPT pipe plugs and adjustment key for zero and span.
INSTALLATION

LOCATION: Select a clean, dry location free from shock and vibration where temperature limits will not be exceeded. Distance from the transmitter to the receiver is limited only by total loop resistance. See ELECTRICAL CONNECTIONS. Tubing feeding pressure to the instrument can be practically any length required, but long lengths will increase response time slightly.

POSITION: All standard models are calibrated for use in a vertical mounting position. Higher range models will perform properly at other angles but should be spanned and zeroed in the position in which they will be used. Because of their sensitivity to gravitational forces, models with ranges under 1" w.c. must always be mounted vertically.

PRESSURE CONNECTIONS: For installation convenience two sets of 1/4" NPT female pressure ports are supplied. Be sure to seal the unused ports with pipe plugs included.

Positive Pressure – Connect tubing to HIGH PRESSURE port and vent LOW PRESSURE port to atmosphere.

Negative (Vacuum) Pressure – Connect tubing to LOW PRESSURE port and vent HIGH PRESSURE port to atmosphere.

Differential Pressure – Connect tubing from the higher source to HIGH PRESSURE port and from the lower source to LOW PRESSURE port.

MOUNTING: The Series 630A Differential Pressure Transmitter may be either panel (flush) mounted or surface mounted.

Panel Mounting – Cut a 4½/8" (122mm) diameter hole in the panel and insert the unit from the front. Slip on the mounting ring with the stepped side facing rear. Next, fit the snap ring into the narrow groove at back edge of bezel. Thread four 6-32 x 1/4" mounting screws into tapped holes in mounting ring and set it against snap ring. Tighten screws against rear of panel. See Fig. C.

Surface Mounting – Drill (4) 3/16" (4.8mm) diameter holes for mounting and cut an 11/16" x 1/4" (17.4 x 27mm) opening for access to terminal block as indicated in Fig. B. Also provide (2) 1/4" (6.3mm) holes for blowout passage as shown. Insert 6-32 machine screws from rear of mounting surface, thread into tapped holes on back of transmitter and tighten.

Fig. C

Fig. B
ELECTRICAL CONNECTIONS

CAUTION: DO NOT EXCEED SPECIFIED SUPPLY VOLTAGE RATINGS. PERMANENT DAMAGE NOT COVERED BY WARRANTY WILL RESULT. THIS UNIT IS NOT DESIGNED FOR 120 OR 240 VOLT AC LINE OPERATION.

All electrical connections for Series 630A Transmitters are made to the five-screw terminal strip on the rear of the case. See Fig. D.

Wire Length – The maximum length of wire connecting transmitter and receiver is a function of wire size and receiver resistance. Wiring should not contribute more than 10% of receiver resistance to total loop resistance. For extremely long runs (over 1000 feet), choose receivers with higher resistances to minimize size and cost of connecting leads. Where wiring length is under 100 feet, lead wire as small as #22 AWG can be used.

2-Wire Operation – An external power supply delivering 13-35 VDC with minimum current capability of 40 mA DC (per transmitter) must be used to power the control loop. See Fig. E for connection of the power supply, transmitter and receiver. Note the jumper between terminals 3 and 4. The range of appropriate receiver load resistance (R_L) for the DC power supply voltage available is expressed by the formula and graph in Fig. H. Shielded two wire cable is recommended for control loop wiring. If grounding is required use negative side of control loop after receiver. In Fig. E below, if power supply lead to terminal 1 is positive, ground should be connected to wiring at right of receiver. Otherwise, in 2 wire operation it is not necessary to observe polarity of control loop connections.

3-Wire Operation – An external power supply delivering 13-35 VDC with minimum current capability of 40 mA DC (per transmitter) is required. See Fig. F for connection of power supply, transmitter and receiver. The range of appropriate receiver load resistance (R_L) for the DC power supply available is expressed by the formula and graph in Fig. H. Shielded cable is recommended for control loop wiring. Do not employ a separate ground in 3 wire operation. Unit will not function properly and/or damage could result. Control loop polarity must be observed in the following respect. Although power supply terminals 1 and 2 are not polarized, the receiver must be connected between terminal 4 of transmitter and positive side of power supply.

4-Wire Operation – An external power supply delivering 13-35 VDC with minimum current capability of 40 mA DC (per transmitter) or 18-26 VAC with minimum current capability of 80 mA AC (per transmitter) is required. See Fig. G for connection of power supply, transmitter and receiver. The range of appropriate load resistance (R_L) for the DC or AC power supply available is expressed by the formulas and graphs in Figs. H and J. Shielded cable is recommended for control loop wiring. Do not employ a separate ground in 4 wire operation. Unit will not function properly and/or damage could result. Control loop polarity must be observed, terminal 3 is positive and terminal 4 is negative. Power supply terminals 1 and 2 are not polarized.

Voltage Input – Series 630A Differential Pressure Transmitters can be easily adapted for receivers requiring 1-5 VDC input. Insert a 250 ohm, 1/2 watt resistor in series with the current loop but in parallel with the receiver input. Locate this resistor as close as possible to the input. Because resistor accuracy directly influences output signal accuracy, we recommend use of a precision ±0.1% tolerance resistor to minimize this effect.
PRESSURE RANGING

Each standard Series 630A Transmitter is factory calibrated to a specific stock range as shown in the Model Number Chart. If unit was specially calibrated it will be marked accordingly. To check calibration or re-calibrate to a different range (within limits described in chart), follow the procedure below. For clarification, range is defined as that pressure which applied to the transmitter will produce 20 mA DC of loop current. Zero pressure will produce 4 mA DC.

1. With transmitter connected to its companion receiver and power supply, an accurate milliammeter ranged to approximately 30 mA should be inserted in series with the current loop. A controllable pressure source should be connected to one leg of a tee with remaining sides run to the high pressure port of the transmitter and an accurate reference gage or manometer. Low pressure port must be vented to atmosphere. The transmitter must be calibrated in the same position in which it will be used; vertical is recommended.

2. Apply electrical power to the system and check for proper operation. Slowly apply pressure and observe whether loop current increases above the 4 mA zero pressure value.

3. Included with the accessories is a spanner type key to adjust zero and span. This helps reduce unauthorized tampering. Apply the full range pressure required and adjust the SPAN control on front of transmitter for a reading of 20 mA in the current loop.

4. Relieve pressure and adjust the ZERO control on front of transmitter for a reading of 4 mA in the current loop.

5. ZERO and SPAN controls are slightly interactive so steps 3 and 4 should be repeated until outputs are consistently 4 and 20 mA, respectively.

6. Remove the milliammeter from the current loop, make connections to system pressure sources and place unit in service.

MULTIPLE RECEIVER INSTALLATION

An advantage of the standard 4-20 mA DC output signal used in Series 630A transmitters is the compatibility with a wide range of receivers. Devices such as the A-701 Digital Readout, A-702 Digital Readout with alarms, a analog panel meter, a chart recorder and other process control equipment can be operated simultaneously. It is only necessary that all devices be designed for a standard 4-20 mA input, the proper polarity of input connections be observed and the combined receiver resistances must not exceed the maximum for the current loop. If any receiver indicates a negative or downscale reading, the signal input leads are reversed.

MAINTENANCE

After final installation of the Series 630A Differential Pressure Transmitter, no routine maintenance is necessary. A periodic check of calibration is recommended following the procedure under PRESSURE RANGING. Except for this, these transmitters are not field serviceable and should be returned, freight prepaid, to the factory if service is needed. Be sure to include a clear description of the problem plus any application information available.

RELATED PRODUCTS

<table>
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<th>Series/Model Number</th>
<th>Catalog Bulletin</th>
<th>Instruction Bulletin</th>
</tr>
</thead>
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<td>Durablock® Inclined Manometers, ranges from 0-25 to 0-23 in. w.c.</td>
<td>Series 100, 200, 300, 400</td>
<td>D-40</td>
<td>D-2, D-3, D-4, D-5</td>
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<tr>
<td>Magnehelic® Differential Pressure Gages, ranges from 0-20 in. w.c. to 30 PSID</td>
<td>Series 2000</td>
<td>A-30</td>
<td>A-27</td>
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<tr>
<td>Digital Panel Meter/Power Supply</td>
<td>A-701</td>
<td>E-50</td>
<td>E-77</td>
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<td>Digital Panel Meter/Power Supply with alarms</td>
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<td>Temperature/Process Controller</td>
<td>Series 1600</td>
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<td>DC Power Supply</td>
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