

## Series 616WL Differential Pressure Transmitter

### Specifications - Installation and Operating Instructions

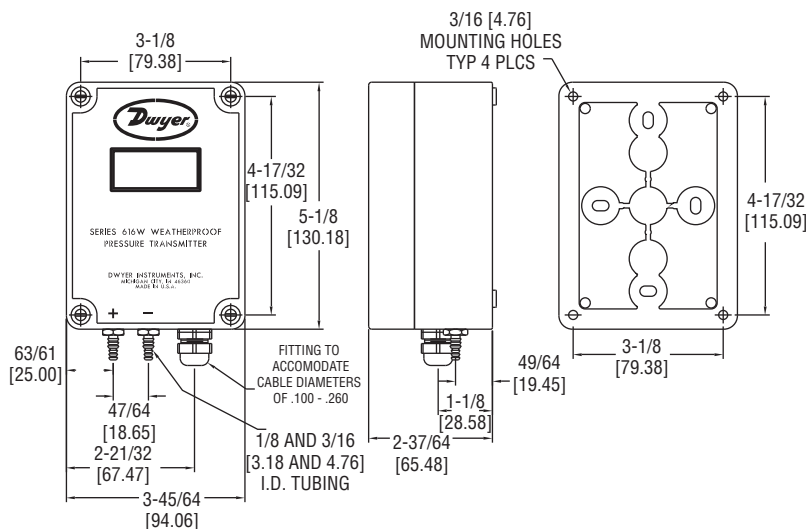


Fig. A

The **Dwyer Series 616WL** Differential Pressure Transmitter senses the pressure of air and non-combustible, compatible gases and sends a standard 4-20 mA output signal.

All models, including those featuring the 3 digit LCD digital read-out, are factory calibrated to specific ranges as listed in the chart below.

Positive, negative and differential pressures can be measured within a full span accuracy of  $\pm 0.50\%$ . This weatherproof unit is enclosed in a polycarbonate case, designed to meet (IP66/NEMA 4X).

The Span and Zero controls are for use when checking calibration. They are not intended for re-ranging to a significantly different span.

#### INSTALLATION

**1. Location:** Select a clean, dry mounting location free from excess vibration where the temperature will remain between 20 and 120°F (-6.7 and 49°C). Distance from the receiver is limited only by total loop resistance. See Electrical Connections below. The tubing supplying pressure to the instrument can be practically any length required, but long lengths will increase response time slightly.

#### SERIES 616WL TRANSMITTER MODELS & RANGES

MODEL NUMBER	PRESSURE RANGE	MAXIMUM PRESSURE	DIGITAL DISPLAY
616WL-2	0-0.25 in. w.c.	2 psig	-
616WL-4	0-1 in. w.c.	4 psig	-
616WL-12	0.25-0-0.25 in. w.c.	2 psig	-
616WL-14	1-0-1 in. w.c.	4 psig	-
616WL-22	0-60 Pa	13.8 kPa	-
616WL-32	60-0-60 Pa	13.8 kPa	-
616WL-25	0-250 Pa	27.6 kPa	-
616WL-35	250-0-250 Pa	27.6 kPa	-
616WL-2-LCD	0-0.25 in. w.c.	2 psig	0-.250
616WL-4-LCD	0-1 in. w.c.	4 psig	0-1.00
616WL-12-LCD	0.25-0-0.25 in. w.c.	2 psig	-.250-0-.250
616WL-14-LCD	1-0-1 in. w.c.	4 psig	1.00-0-1.00
616WL-22-LCD	0-60 Pa	13.8 kPa	0-60.0
616WL-32-LCD	60-0-60 Pa	13.8 kPa	-60.0-0-60.0
616WL-25-LCD	0-250 Pa	27.6 kPa	0-250
616WL-35-LCD	250-0-250 Pa	27.6 kPa	250-0-250

#### SPECIFICATIONS

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Accuracy:**  $\pm 0.50\%$  F.S., display accuracy  $\pm 0.5\%$ .

**Stability:**  $\pm 1\%$  F.S./yr.

**Temperature Limits:** 0 to 140°F (-17.8 to 60°C).

**Compensated Temperature Limits:** 32 to 120°F (0 to 48.9°C).

**Pressure Limits:** See chart.

**Thermal Effect:**  $\pm 0.02\%$  F.S./°F (0.036% F.S./°C) from 77°F (25°C).

**Power Requirements:** 12-30 VDC (2-wire).

**Output Signal:** 4 to 20 mA.

**Zero and Span Adjustments:** Digital, Push Button Adj.

**Loop Resistance:** DC; 0-900 ohms maximum.

**Current Consumption:** DC; 38 mA maximum.

**Electrical Connections:** Screw-type terminal block.

**Process Connections:** Barbed, dual size to fit 1/8" and 3/16" (3.12 and 4.76 mm) I.D. rubber or vinyl tubing.

**Enclosure Rating:** NEMA 4X (IP66).

**Mounting Orientation:** Vertical, consult factory for other position orientations.

**Weight:** Without LCD 17 oz (482 g); with LCD 18 oz (510 g).

**Agency Approvals:** CE.

CE The following standards were used for CE approval:	
Specifications	Test Result
CENELEC EN 61000-4-2: 2001	PASS CRITERION A
CENELEC EN 61000-4-3: 2002	PASS CRITERION B
CENELEC EN 61000-4-4: 1995	PASS CRITERION B
CENELEC EN 61000-4-5: 2001	PASS CRITERION A
CENELEC EN 61000-4-6: 2003	PASS CRITERION A
CENELEC EN 55011: 1998	PASS CRITERION B
CENELEC EN 61326: 2002	PASS

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**2. Position:** A vertical position, with the pressure connection pointing down, is recommended. That is the position in which all standard models are spanned and zeroed at the factory. They can be used at other angles, but final spanning and zeroing must be done while transmitter is in that alternate position.

**3. Pressure Connections:** Two integral barbed tubing connections are provided. They are dual-sized to fit both 1/8" and 3/16" (3.2 and 4.8 mm) I.D. tubing. Be sure the pressure rating of the tubing exceeds that of the operating range. On ranges over 20 psi, we recommend use of a suitable hose clamp to assure the integrity of the connection.

## 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 volts AC line operation.**

Electrical connections are made to the terminal block located on the inside of the transmitter. Terminals are marked +, -. See Fig. B.

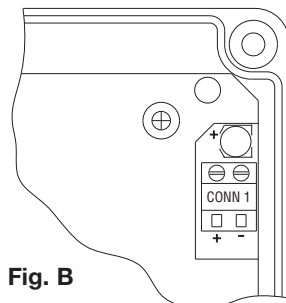


Fig. B

**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 the receiver resistance to total loop resistance. For extremely long runs (over 1000 feet), choose receivers with higher resistance to minimize size and cost of connecting leads. Where wiring length is under 100 feet, hook-up wire as small as 22 AWG can be used.

**2-Wire Operation** - An external power supply delivering 12-30 VDC with minimum current capability of 40 mA DC (per transmitter) must be used to power the control loop. See Fig. C for connection of the power supply, transmitter and receiver. The range of appropriate receiver load resistance ( $R_L$ ) for the DC power supply voltage available is expressed by the formula.

$$R_L \text{ Max} = \frac{V_{ps} - 12V}{20\text{mA DC}}$$

Shielded two wire cable is recommended for control loop wiring. If grounding is required, use the negative side of the control loop after the receiver. Otherwise, in the 2-wire operation it is not necessary to observe polarity of control loop connections.

## 2-Wire Connections

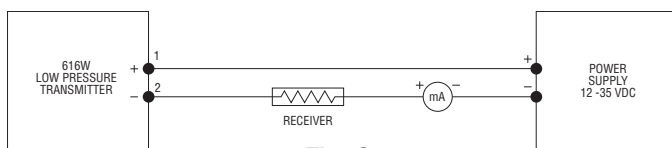


Fig. C

**Calibration Check** - Each Series 616WL Transmitter is factory calibrated in the vertical position to the range given in the model chart. To check calibration and adjust if necessary, the following procedure should be used. For purposes of clarification in these instructions, range is defined as that pressure which, applied to the transmitter, produces 20 milliamps of current in the loop. Zero pressure is always assumed to be 4 milliamps.

1. With the transmitter connected to the companion receiver, insert an accurate milliammeter in series with the current loop. Full scale range should be approximately 30 mA.
2. Connect a controllable pressure source to one leg of a tee with the other two legs connected to the high pressure port of the transmitter and the third leg to an accurate test gage or manometer, in an appropriate range. The low pressure port should be vented to atmosphere. Calibration must be performed with the unit in the same position in which it will be mounted.
3. Apply electrical power to the unit and allow it to stabilize for 15 minutes.
4. With no pressure applied to the transmitter, adjust ZERO control so that loop current is 4 mA. Zero center units, ie. 1-0-1 in w.c. units, will output 12 mA with no pressure applied. To calibrate zero center units an accurate pressure source must be used to apply the minimum pressure then adjust zero control to 4 mA. Use the increase/decrease buttons located on left side. See Fig. D.
5. Apply full range pressure and adjust loop current to 20 mA using SPAN control. Use the increase/decrease buttons located on the right side. See Fig. D.
6. Relieve pressure and allow transmitter to stabilize for 2 minutes.
7. Zero and span controls are slightly interactive, so repeat steps 4 through 6 until zero and full range pressures consistently produce currents of 4 and 20 mA respectively.
8. Remove the milliammeter from the current loop and proceed with final installation of the transmitter and receiver.

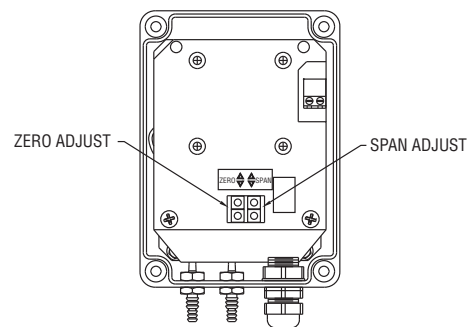


Fig. D

## MAINTENANCE

Upon final installation of the Series 616WL Differential Pressure Transmitter, no routine maintenance is required. A periodic check of the system calibration is recommended following the procedures explained under Calibration Check. The Series 616WL Transmitter is not field serviceable and should be returned, freight prepaid, to the factory if repair is required. Please enclose a description of the problems encountered plus any available application information. Contact customer service to receive a return goods authorization number before shipping.