



*Excellence Since 1953*

## LE3 AND LIM SERIES Installation and Operational Manual



- ▶ cULus approvals for use in non-hazardous locations.
- ▶ RoHS & REACH Compliant.
- ▶ Lightweight and compact footprint
- ▶ Highly accurate down to 0.25% FS
- ▶ Vacuum to 10,000 psi, custom ranges available
- ▶ Long term stability, reducing maintenance & calibration cost
- ▶ Multiple process & electrical connections to meet your application needs
- ▶ CE compliant with highly corrosion resistant material, environment friendly halogen free wires and superior EMI/RFI protection
- ▶ High over pressure protection to prevent sensor damage from initial pump start up.

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## 1.0 GENERAL:

To ensure proper and safe operation of a Winters pressure transmitter, the entire manual must be read and understood clearly. Please pay special attention to all safety information.

## 2.0 INTENDED USE:

Winters' pressure transmitter is intended to provide pressure measurement for use in monitoring system pressures across industrial applications.

## 3.0 SAFETY INSTRUCTIONS AND WARNINGS:

⚠ Read this manual before working with the product. The contents must be thoroughly read and understood before installing, using or maintaining this product. Misuse of this product may cause explosion and personal injury.

⚠ LE3 and LIM series for Ordinary Locations (Non-Hazardous)



⚠ Temperature Range:

Compensated:

Piezo Version: 0 to +165 °F (-18 to +74 °C)

Ceramic version: 77 to 185 °F (+25 to +85 °C)

Storage: -40 to +212°F (-40 to +100°C)

Media: -40 to +257°F (-40 to +120°C)

Operating (ambient): -40 to +212°F (-40 to +100°C).

⚠ Prior to installation, check the wetted parts material for compatibility to the process media.

⚠ This product should be installed according to local standards and safety codes for that area.

⚠ This product does not have any field replaceable parts. Any replacement of components will invalidate third-party issued approvals and certifications.

⚠ Avoid contact with the exposed leads and terminals. High voltage that may be present on leads can cause electrical shock.

⚠ Properly tighten process connections before applying pressure.

⚠ Apply and maintain pressure within the limits of markings of the device.

## 4.0 Technical Data

### LE3 Specifications

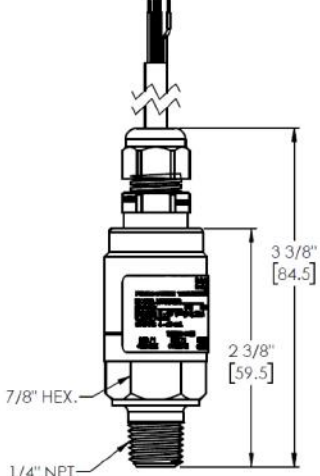
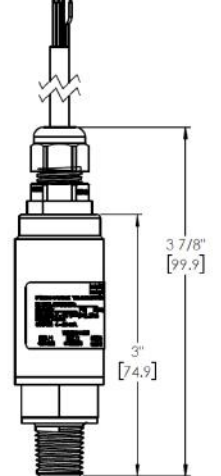
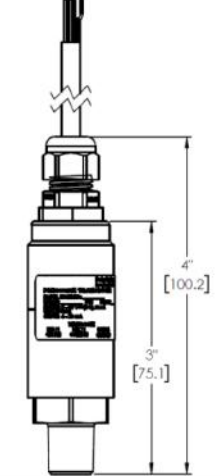
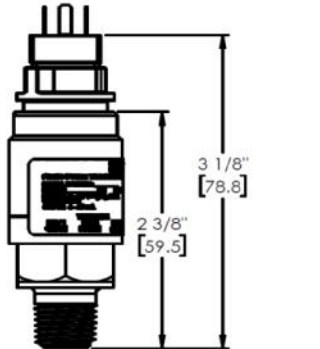
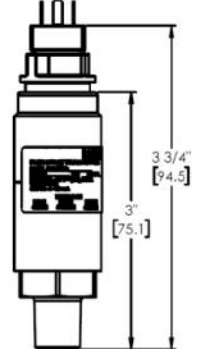
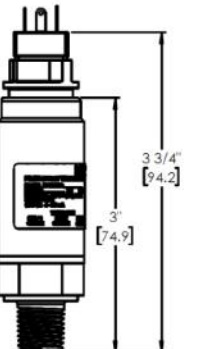
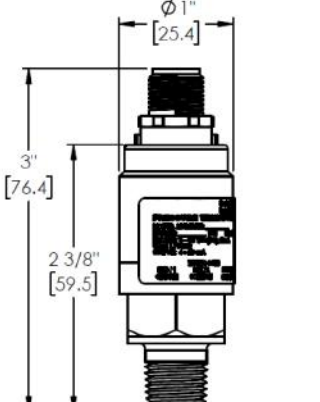
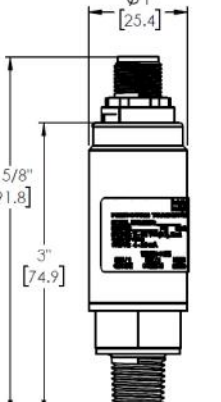
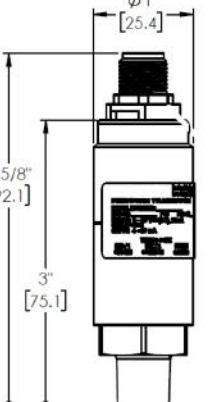
<b>Output Signal</b>	4...20 mA, 2-wire / Vs = 8-33 Vdc 0...10 Vdc, 3-wire / Vs = 12-33 Vdc 1...5 Vdc, 3-wire / Vs = 7-33 Vdc 0.5...4.5 Vdc, 3-wire, ratiometric output / Vs = 4.5-5.5 Vdc (UL listing not included)
<b>Response Time</b>	4...20 mA = 3 ms, all others = 5 ms
<b>Current Consumption</b>	4...20 mA = 22 mA maximum, all others = 15 mA maximum
<b>Accuracy</b>	±0.5% Full Scale Output, ±0.6% FSO for ranges greater and equal to 4,000 psi
<b>Long-Term Stability</b>	±0.2% FSO (typically per year)
<b>Wetted Parts</b>	316SS Pressure port, Ceramic sensor with Viton O-ring
<b>Shock</b>	50 g's 11 ms, MIL-STD 202 Method 213 G
<b>Vibration</b>	15 g's 10 to 2,000 Hz, MIL-STD 202
<b>Storage Temperature</b>	-40 to 100 deg C (-40 to 212 deg F)
<b>Media Temperature</b>	-40 to 120 deg C (-40 to 248 deg F)
<b>Reverse Polarity Protection</b>	Yes
<b>EMI-EMC Compliance</b>	IEC 61000 4-2 to 4-6, IEC 61326-1 Class A
<b>Enclosure Rating</b>	NEMA 4X; IP65 or IP67
<b>Approvals</b>	UL listed or UL recognized for USA and Canada, CRN pending
<b>Compliance</b>	RoHS, REACH, CE
<b>Operation Life</b>	1 million cycles, minimum
<b>Weight</b>	120 g (4.23 oz)

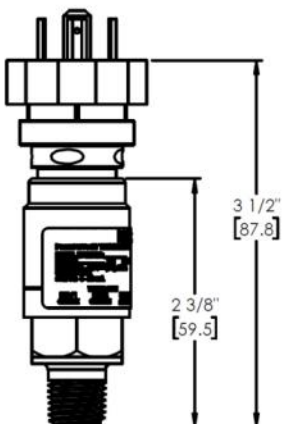
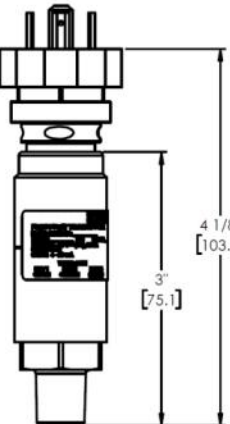
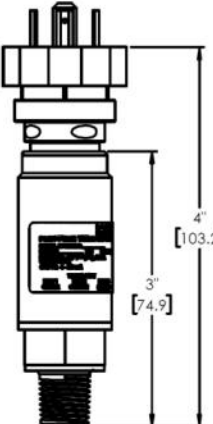
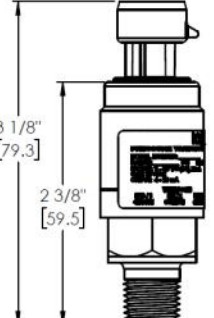
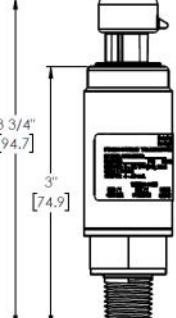
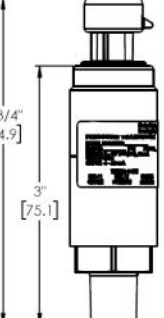
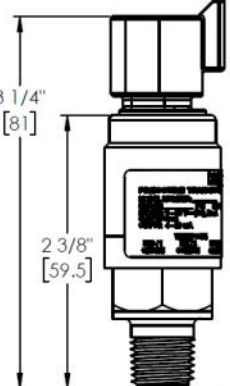

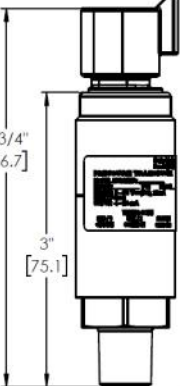
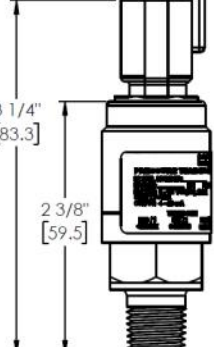
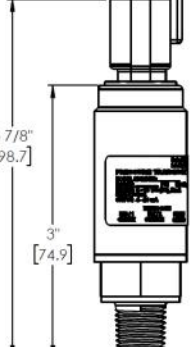
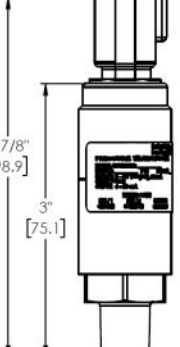
### LIM Specifications

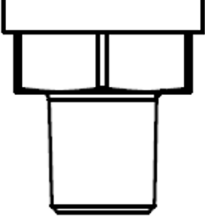
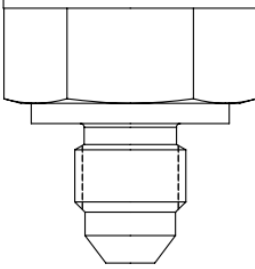
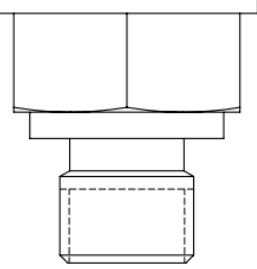
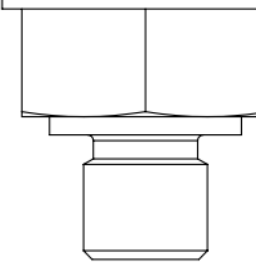
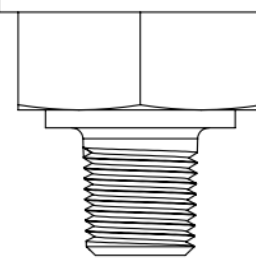
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<b>Response Time</b>	4...20 mA = 3 ms, all others = 5 ms
<b>Current Consumption</b>	4...20 mA = 22 mA maximum, all others = 15 mA maximum
<b>Accuracy</b>	±0.25% Full Scale Output
<b>Long-Term Stability</b>	±0.2% FSO (typically per year)
<b>Wetted Parts</b>	316SS all welded or 17-4 PH SS with NBR O-ring
<b>Shock</b>	50 g's 11 ms, MIL-STD 202 Method 213 G
<b>Vibration</b>	15 g's 10 to 2,000 Hz, MIL-STD 202
<b>Storage Temperature</b>	-40 to 100 deg C (-40 to 212 deg F)
<b>Media Temperature</b>	-40 to 120 deg C (-40 to 248 deg F)
<b>Reverse Polarity Protection</b>	Yes
<b>EMI-EMC Compliance</b>	IEC 61000 4-2 to 4-6, IEC 61326-1 Class A
<b>Enclosure Rating</b>	NEMA 4X; IP65 or IP67
<b>Approvals</b>	UL listed or UL recognized for USA and Canada, CRN pending
<b>Compliance</b>	RoHS, REACH, CE
<b>Operation Life</b>	1 million cycles, minimum
<b>Weight</b>	120 g (4.23 oz)

### 4.2 Mounting

Always locate the product where shock, vibration and ambient temperature fluctuations are minimal. Do not mount in ambient temperature areas exceeding 100°C (for cULus installation). Apply torque 125 to 150 lb.in to the flat available at the process connection of the transducer. Refer below dimensional drawing while mounting of the unit.

Electrical	LE3	LIM WITH ALL SS WELDED AND O-RING	LIM WITH ALL SS WELDED	
PVC Shielded & jacketed #24 AWG cable (1 meter)	 <p>Dimensions: 3 3/8" [84.5], 2 3/8" [59.5], 7/8" HEX., 1/4" NPT.</p>	 <p>Dimensions: 3 7/8" [99.9], 3" [74.9].</p>	 <p>Dimensions: 4" [100.2], 3" [75.1].</p>	IP67
Subminiature DIN connector (DIN 43650/EN 175301-803, TYPE C)	 <p>Dimensions: 3 1/8" [78.8], 2 3/8" [59.5].</p>	 <p>Dimensions: 3 3/4" [94.5], 3" [75.1].</p>	 <p>Dimensions: 3 3/4" [94.2], 3" [74.9].</p>	IP65
M12 (4 Pin) connector	 <p>Dimensions: 3" [76.4], 2 3/8" [59.5], <math>\phi</math> 1" [25.4].</p>	 <p>Dimensions: 3 5/8" [91.8], 3" [74.9], <math>\phi</math> 1" [25.4].</p>	 <p>Dimensions: 3 5/8" [92.1], 3" [75.1], <math>\phi</math> 1" [25.4].</p>	IP67

<p>Standard DIN connector (DIN 43650/EN 175301-803, TYPE A)</p>				<p>IP65</p>
<p>Aptiv/Delphi Metripack 150 Series Connector</p>				<p>IP65</p>
<p>3 Pin Deutsch Connector</p>				<p>IP65</p>
<p>4 Pin Deutsch Connector</p>				<p>IP65</p>

Process Connections				
				
1/4" NPT, Male	7/16-20 UNF male(JIC 37°)	G1/4 male (gasket seal)	7/16-20 SAE #4 ORB	1/8" NPT Male

### 4.3 Wiring and Pin Connection:

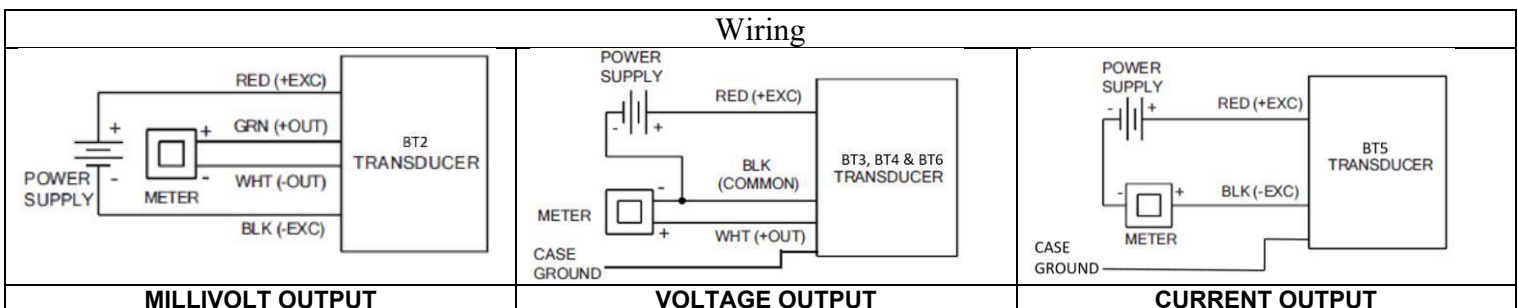
Use quality low-capacitance twisted pair or shielded wire cable. Do not run wires next to power lines, electrical systems, motors, generators, or any other equipment which may generate a significant amount of electrical noise or magnetic fields. If shielded cable is used, ground only one side of the cable, typically to the negative side of the power supply.

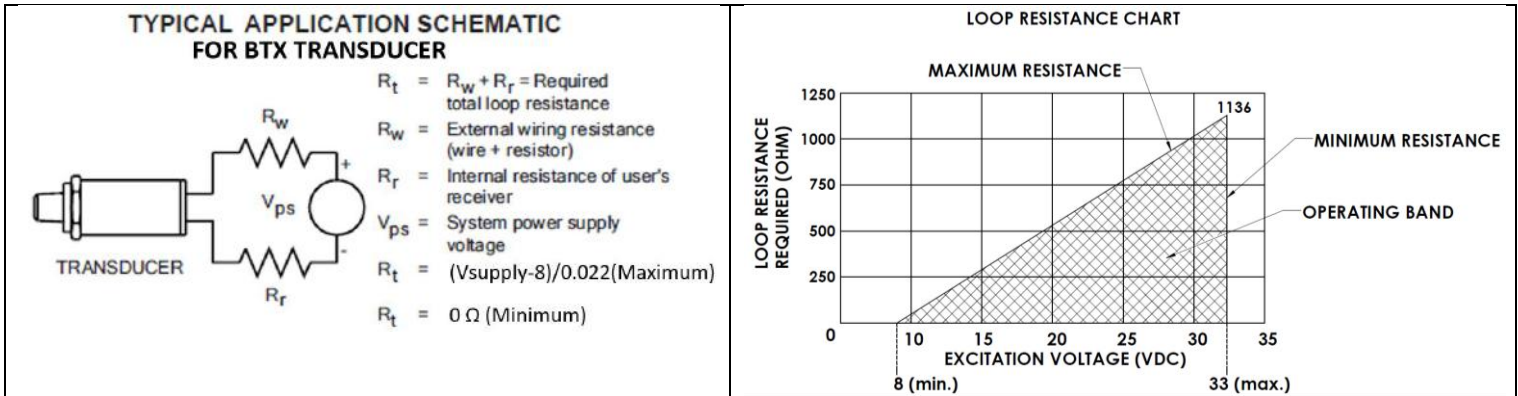
As a general rule, if the cable length is less than 5000 ft., #24 AWG wire can be used. Any cable runs over 5000 ft. should use #20 AWG wiring. Customer can do the further wire connection to standard 18 AWG wire provided with unit.

#### Wire Code for connections:

ELECTRICAL CONNECTIONS								
ELECTRICAL SIGNAL	ELECTRICAL TERMINATION							
	CABLE OUTPUT		3-PIN DEUTSCH, APTIV/DELPHI		MINI-DIN, M12, DIN		4-PIN DEUTSCH	
	VOLTAGE	CURRENT	VOLTAGE	CURRENT	VOLTAGE	CURRENT	VOLTAGE	CURRENT
+EXCITATION	RED	RED	PIN 1	PIN 1	PIN 1	PIN 1	PIN 2	PIN 2
-EXCITATION (COMMON)	BLACK	BLACK	PIN 2	PIN 2	PIN 2	PIN 2	PIN 1	PIN 1
VOLTAGE OUTPUT	WHITE	-	PIN 3		PIN 3	-	PIN 4	
CASE GROUND/ DRAIN/EARTH	DRAIN	DRAIN		PIN 3	PIN 4	PIN 4	PIN 3	PIN 3

The unit should be attached to the power supply with load resistor in series as shown in the picture below to create the current loop. A current meter can be placed anywhere on the loop to measure the loop current. A voltmeter can also be used to measure the current by measuring the voltage across the 250 ohm in series as shown in the picture below.





## 5.0 Troubleshooting:

This section provides summarized maintenance and troubleshooting suggestions for the most common operating problems.

Faults	Causes	Corrective Action
No output signal	Cable break No/wrong power supply	Check the continuity of the cable and if required replace the cable Rectify the power supply (for example: Polarity)
Wrong output signal	Improper power supply voltage	Increase or decrease the power supply voltage to operate the device within the specifications
No change in output signal upon change in applied pressure	Sensor damage due to overpressure applied	Replace unit; Contact Winters
Signal output is not proportional to applied pressure	Sensor damage due to overpressure applied Sealing damaged or Improper sealing or improper mounting	Replace unit; Contact Winters Clean the sealing face and mount properly if applicable replace sealing.
Fluctuations in the output signal	Electromagnetic interference sources in the field around device (for example switching of heavy inductive load, etc..)  Unit not grounded  Strongly fluctuating pressure of the process medium	Shield unit; cable shield; remove source of EMC interference  Ground the unit  Damping; consult Winters
Output signal out of the limit	Applied pressure is out of calibration range	Adjust the pressure within the calibration range