Barksdale®
CONTROL PRODUCTS
CRANE Barksdale, Inc./Barksdale GmbH
A Subsidiary of Crane Co.

BOT - Barksdale OEM Transducer

BTX Series

Installation and Operational Manual

- cULus approvals for use in non-hazardous locations.
- RoHS & REACH Complaint.
- 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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Contents

1.0 GENERAL:

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

2.0 INTENDED USE:

Barksdale's pressure transducer 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 maintain this product. Misuse of this product may cause explosion and personal injury.

⚠ BTX series for Ordinary Locations (Non-Hazardous):

34MX
c UL us
LISTED
NTMR(7)
INDUSTRIAL
CONT. EQUIP.
QUYX(7)
PROCESS
CONT. EQUIP.
TYPE 4X

CE 0081

⚠ 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.

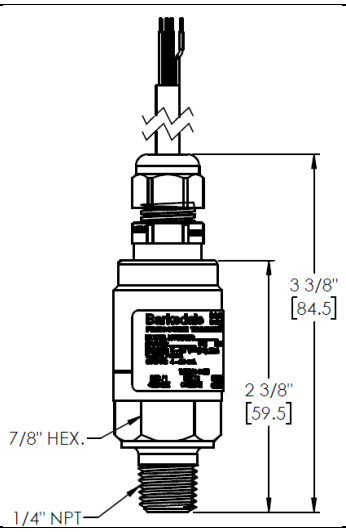
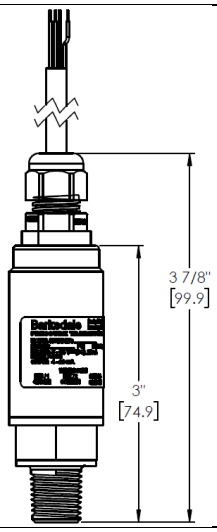
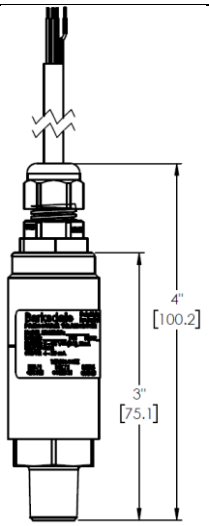
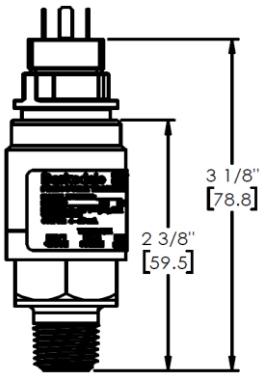
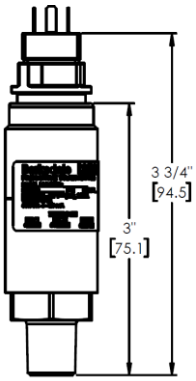
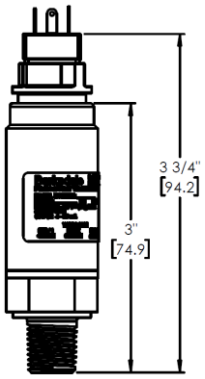
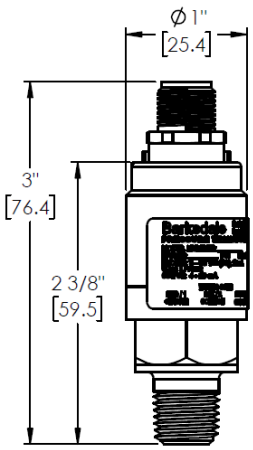
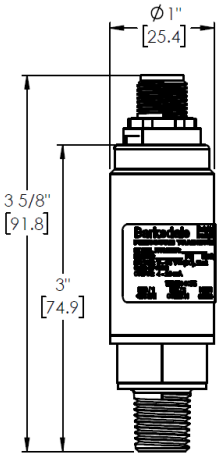
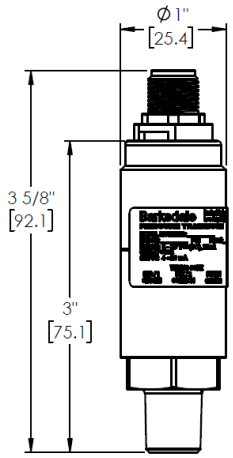
4.0 Technical Data

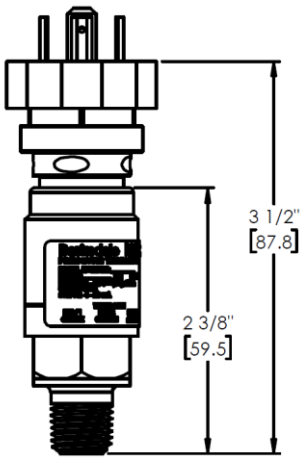
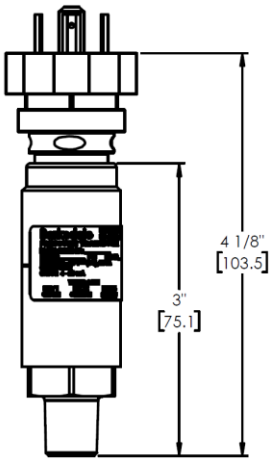
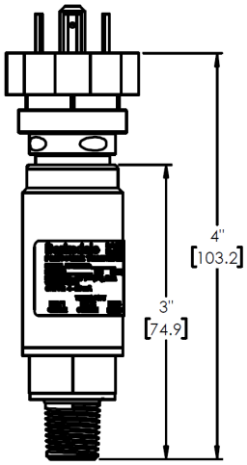
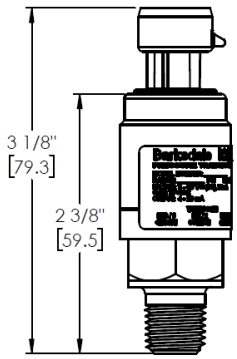
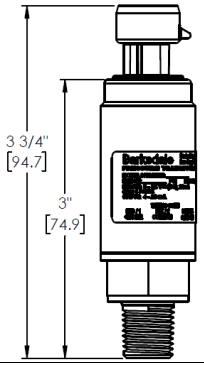
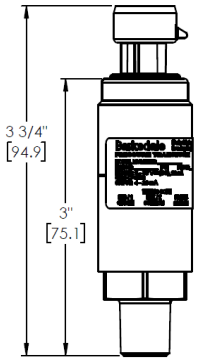
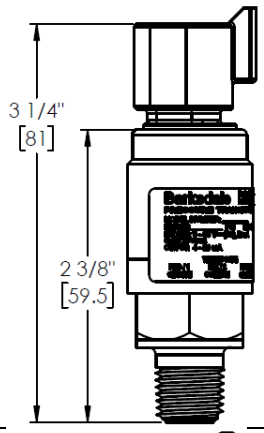
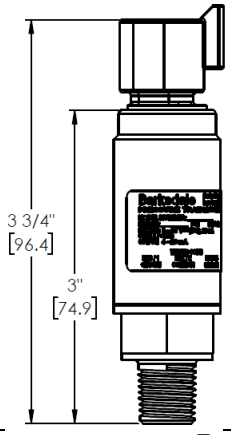
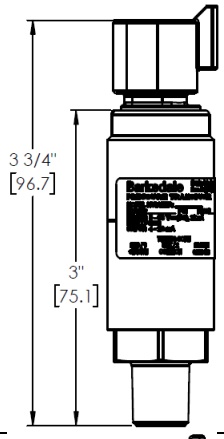
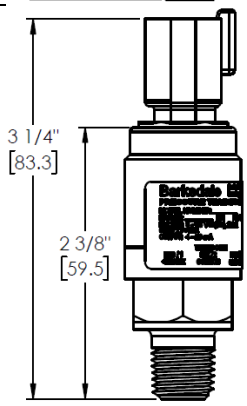
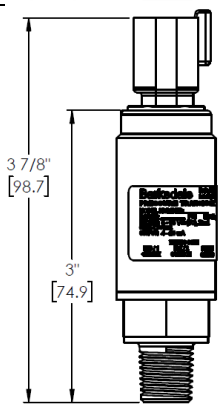
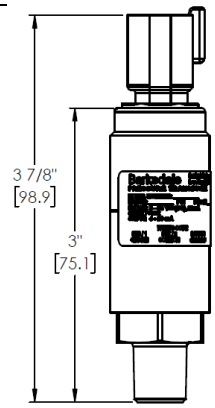
4.1 Common Specifications for All Units

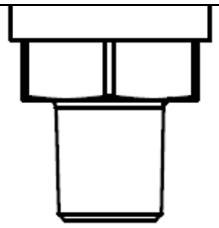
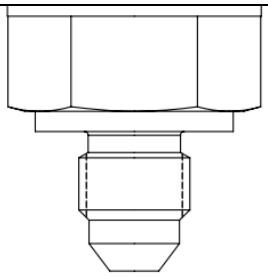
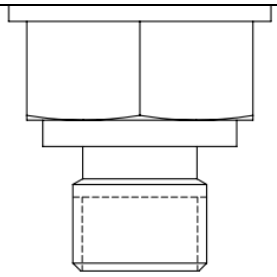
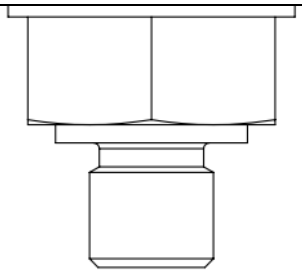
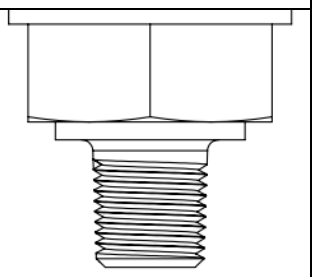
Calibration Reference Conditions		CALIBRATION	
Ambient Temperature:	-40°F to 212°F	All models are tested to meet or exceed the published specifications. The calibration and testing were done using instrumentation and standards traceable to the National Institute of Standards and Technology (NIST). Also tested in accordance with MIL-STD-45662A.	
Relative Humidity:	40 to 60%		
Barometric Pressure:	29.92 in. Hg.		
Performance Characteristics			
Accuracy (LH&R):	Best Fit Straight Line (BFSL) @75°F	**Vibration:**	15 g's, 10 to 2000 Hz (MIL-STD-202)
	C Class: ± 0.5% FS		
	W & P Class: ± 0.25% FS	**Shock:**	50 g's, 11 ms (MIL-STD-202, M213, Cond. G)
Long Term Stability:	± 0.2% FSO (typical)	**Wetted Material:**	300 series and 17- 4 PH stainless steel.
		Electrical Connection:	1 meter jacketed cable, standard
Proof Pressure:	2 times rated pressure range	**Pressure Cavity Volume:**	0.075 inches maximum
Life Cycle:	Full scale pressure cycles: 1 Million Cycles	**Enclosure Rating:**	NEMA 4X
	VOLTAGE OUTPUT MODELS	**CURRENT OUTPUT MODEL (BT5)**	**MILLIVOLT OUTPUT MODELS (BT2)**
Excitation:	7 to 33 VDC operating (BT3)	8 to 33 VDC operating (BT5)	15 VDC MAX operating (BT2)
	12 to 33 VDC operating (BT6)		
	4.5 to 5.5 VDC operating (BT4)		
Output:	1 to 5 VDC (BT3)	4 - 20mA (BT5)	10 mV/V (BT2)
	0 to 10 VDC (BT6)		
	0.5 to 4.5 VDC (BT4)		
Zero Balance:	±1% FSO @ 75°F (24°C) For W & P Option ±2% FSO @ 75°F (24°C) For C Option		
Span Accuracy:	±1% FSO @ 75°F (24°C)		
Protection:	Short Circuit, Reverse Polarity, EMI/EMC, UL, RoHS, REACH, IP		
Minimum Load Resistance:	≥ 7.5 kΩ	Max Loop Load= (Vsupply-8)/0.022	-
Temperature Range:	Compensated range for piezo: 0 to +165 °F (-18 to +74 °C) Compensated range for ceramic: 77 to 185 °F (+25 to +85 °C) Storage temperature range: -40 to +212 °F (-40 to +100 °C) Media temperature range: -40 to +257 °F (-40 to +120 °C) Operating (ambient) temperature: -40°F to 212°F (-40° to +100° C)		
Temperature Error:	±0.02% of FS/°F over the compensated temperature range		
Weight:	450 g (approximately)		

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	C Class	W Class	P Class	Ingress Protection
PVC Shielded & jacketed #24 AWG cable (1 meter)				IP67
Subminature DIN connector (DIN 43650/EN 175301-803, TYPE C)				IP65
M12 (4 Pin) connector				IP67

Standard DIN connector (DIN 43650/EN 175301-803, TYPE A)				IP65
Aptiv/Delphi Metripack 150 Series Connector				IP65
3 Pin Deutsch Connector - DT04-3P				IP65
4 Pin Deutsch Connector - DT04-4P				IP65

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:

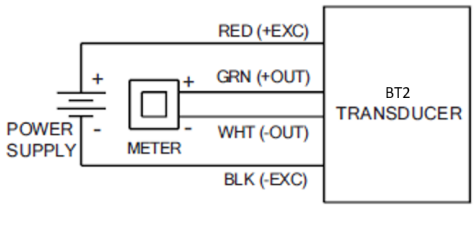
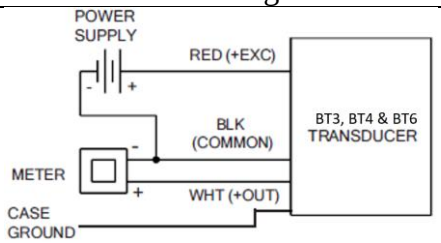
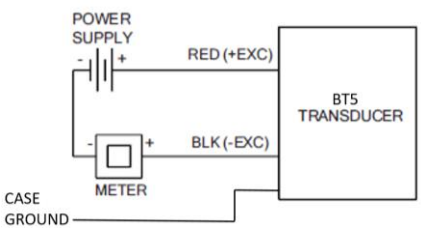
Use quality low-capacitance twisted pair or shielded wire cable. Do not run wires next to power lines, electrical systems, motors, generators, or any other equipment which may generate a significant amount of electrical noise or magnetic fields. If shielded cable is used, ground only one side of the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

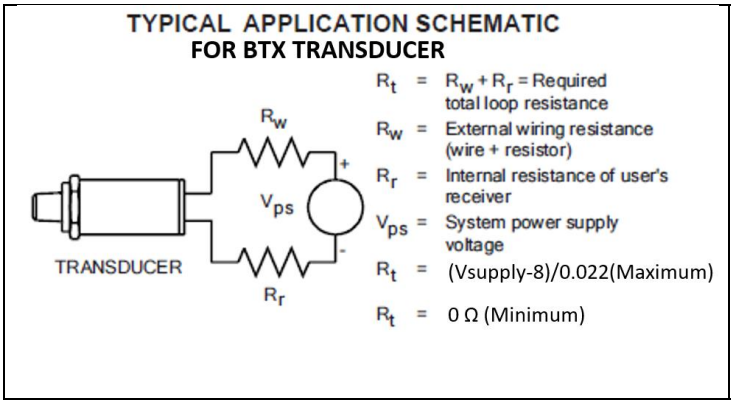
As a general rule of thumb, if the cable length is less than 5000 ft., #24 AWG wire can be used. Any cable runs over 5000 ft. should use #20 AWG wiring. Customer can do the further wire connection to standard 18 AWG wire provided with unit.

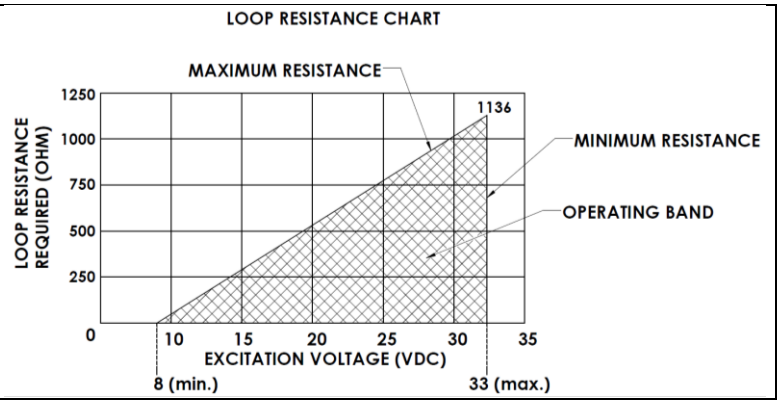
Wire Code for connections:

ELECTRICAL CONNECTIONS										
ELECTRICAL SIGNAL	**ELECTRICAL TERMINATION**									
	H3		**D3/T6**		**H4/T4/T5**		**D4**		**-Q50**	
	VOLTAGE	**CURRENT**	**VOLTAGE**	**CURRENT**	**VOLTAGE**	**CURRENT**	**VOLTAGE**	**CURRENT**	**VOLTAGE**	**CURRENT**
+EXCITATION	RED	RED	PIN 1	PIN 1	PIN 1	PIN 1	PIN 2	PIN 2	PIN 1	PIN 1
-EXCITATION (COMMON)	BLACK	BLACK	PIN 2	PIN 2	PIN 2	PIN 2	PIN 1	PIN 1	PIN 3	PIN 3
VOLTAGE OUTPUT	WHITE	-	PIN 3		PIN 3	-	PIN 4		PIN 2	
CASE GROUND/ DRAIN/EARTH	DRAIN	DRAIN		PIN 3	PIN 4	PIN 4	PIN 3	PIN 3	PIN 4	PIN 4

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.

Wiring		
		
MILLIVOLT OUTPUT	**VOLTAGE OUTPUT**	**CURRENT OUTPUT**





5.0 Troubleshooting:

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

Faults	Causes	Measures
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 with in the specifications
No change in output signal upon change in applied pressure	Sensor damage due to overpressure applied	Replace unit; Contact Barksdale.
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 Barksdale. 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; consulting by Barksdale
Output signal out of the limit (for example: output signal 5.1 Volt for BT3)	Applied pressure is out of calibration range	Adjust the pressure within the calibration range

6.0 Product configurator – How to order

Refer to configurator table on sales drawing or datasheet to configure the product.

- BTX Series: https://www.barksdale.com/tools-resources/reference-library?category[340]=340

Online product configurator and RFQ

- e-Configurator: https://configurator.barksdale.com/

7.0 Appendix A: Installation and Maintenance Instructions (IMI)

- BTX Series: https://www.barksdale.com/en/products/datasheet/

8.0 Appendix B: Product Certifications & Downloads

- BTX Series: https://www.barksdale.com/tools-resources/reference-library?category[340]=340

9.0 Return Request / Inquiries

Direct all warranty and repair requests/inquiries to Barksdale, Inc. Customer Service Department.
Call 323-589-6181, FAX: 323-589-3463
Before returning any product(s) to Barksdale, you must obtain a returned merchandise authorization from our customer service department (in order to avoid processing delays).
For warranty returns, please have the following information available BEFORE contacting Barksdale:

1. P.O. number under which the product was PURCHASED.
2. Model number of the product under warranty.
3. Repair instructions and/or specific problems you are having with the product.
4. Application information.