NEW

New BiT with HART® Communication Protocol

BiT - Barksdale Intelligent Transmitters

Series 450, 450X & 450E

A New Generation of Barksdale Digital Transmitters

- New transmitters offering lightweight, compact footprint, higher accuracy & higher pressure ranges
- Oil & Gas, Explosion Proof Models: Series 450X
- Oil & Gas, Intrinsically Safe Models: Series 450E
- Non-Hazardous/Ordinary Locations Models: Series 450
- HART® Communication Protocol & Digital Amplifier Models Available

Control every move

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

Barksdale Transmitters

A performance legacy

New BiT Series

BiT - Barksdale Intelligent Transmitter

With 24 standard pressure ranges from vacuum to **30,000 PSI** and multiple electrical and process connections, our intelligent transmitter is designed to meet your application needs. From high pressure models, to intrinsically safe and explosion proof models, to models with HART® communication protocol--our BiT is compact in size and big in performance.

Series 450, 450E & 450X

Barksdale
Engineering the future

Barksdale - Innovating since 1949

With over 70 years experience, Barksdale has been at the forefront of innovation with patented designs like our Shear-Seal® technology used in our valves with great success in demanding applications such as workholding, oil exploration and processing. Invented in 1949, Barksdale engineers have successfully built upon this technology expanding its product portfolio and have continued to offer best-in-class solutions to our customers in safety critical applications. This same technology was again reinvented and incorporated in our air suspension valves that have been used in the transportation industry with much success since 1992. Our switch technology has also made its mark in the industry. Barksdale's ground breaking temperature switch design, known for accuracy and reliability, enjoy a heritage that dates back to the mid-1960's when Barksdale perfected the first effective method for ambient compensation of bulb and capillary type switches. In the 1980's, Barksdale entered the transducer business and has developed a complete line of pressure transducers and transmitters for general industrial, intrinsically safe and hazardous applications. Our latest product innovation is our BiT -- Barksdale Intelligent Transmitter with HART®, which offers big performance in a small package.

Crane Co. our Parent Company

Barksdale is proud to be a part of the Crane Co. family, a diversified manufacturer of highly engineered industrial products. With approximately 12,000 employees worldwide and four business segments: Fluid Handling, Payment & Merchandising Technologies, Aerospace & Electronics and Engineered Materials, Crane Co. associates work together to develop synergies to grow our business and benefit our customers. Founded in 1855, Crane Co. remains committed to the business principles of its founder, R.T. Crane, to conduct business with honesty and integrity.

Introducing our *new* BiT

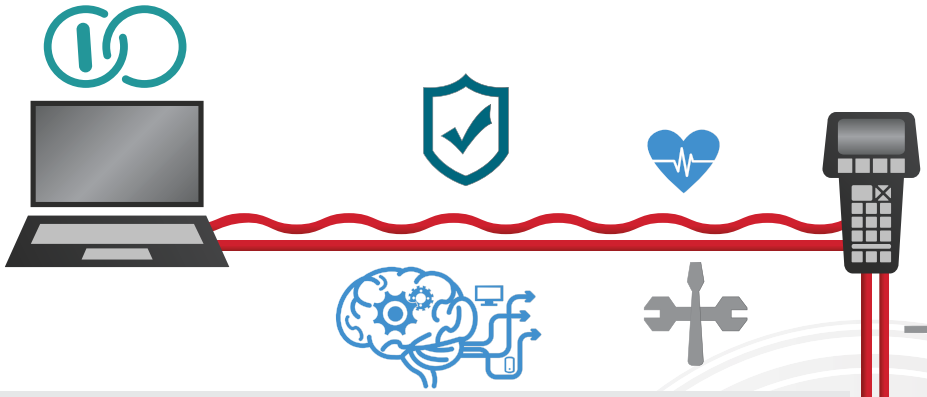
Designed to meet your application needs

Barksdale®

Digital Transmitter
Compatible with conventional installations

SMART TRANSMITTER

Unlocking the true potential of your transmitter



Equipped with HART® communication protocol, embracing smart features such as transmitter diagnostics, calibration and field re-ranging up to 10 times less than calibrated full scale output. HART® enabled pressure transmitters can communicate over the legacy two-wire 4–20 mA analog current loops.

Reliable

HART® technology provides a reliable, proven solution for leveraging the benefits of intelligent devices with digital communication. Reliability of the new BiT series is supported by a rugged platform that has been tested extensively to meet burst pressure, vibration & shock, and electrical EMC requirements.

Accurate

Accuracy and stability are enhanced both through sensor technology and digital linearization of sensor output. HART® capability will allow you to adjust calibration to maintain accuracy.

Intelligent

HART® enabled transmitters provide higher data availability without the up-front investment in digital field networks, by using existing 2-wire current loop infrastructure. Digital data available includes transmitter configuration, calibration, and device status.

Remote Calibration & Re-ranging

HART® enables connectivity to transmitters which allows calibration from the safety and comfort of the control room. Remote calibration capabilities include zero trim and span adjustment, 10:1 turn down ratio which allows multiple ranges from a single transmitter.

Diagnostics

HART® diagnostics capability alerts when the transmitter has failed by latching at 4 or 20 mA output. HART® transmitters communicate diagnostic information to the control room, which minimizes the time required to identify the source of any problem and allows for quick corrective action. As a result, trips into the field or hazardous areas are reduced or eliminated.

Low Maintenance

HART® enabled devices reduce unplanned shutdowns and maintenance with diagnostic capabilities including device status, which allows quick identification of a failing device. Maintenance is also reduced with its remote calibration and ability to view, verify, test and clone existing configurations, which can be downloaded to other transmitters from a control room.

New BiT
Engineered to perform

Engineered Innovative Design

BiT's lightweight and compact design reduces the product footprint in your application. All-welded rugged stainless steel construction allows for use in test & measurement and hazardous area applications. The explosion proof enclosure (flame proof and dust proof) provides IP66 & IP67, NEMA 4X, 7 & 9 ratings and an operating temperature range of -40° F to 176° F. Intrinsically safe design limits electrical and thermal energy below the threshold required to ignite a hazardous gas mixture. Designed with safety in mind, Barksdale Intelligent Transmitters are equipped with environmental friendly halogen-free output wires and cable providing low toxicity in the event of a fire. NACE compliance is achieved by optional 316L Stainless Steel or 718 Inconel wetted material for up to 10,000 psi ranges. Third party certifications includes cULus, cCSAus, ATEX, IECEx, CE, CRN, Single Seal, and HART® Foundation approvals to validate design.

Thin-Film vs. Strain-Gage Technology

The best modern designs of pressure and load sensor are based on thin film technology, proven in the tough environmental conditions where temperature, shock, vibration and EMC resilience are required. With the Titanium Nitride (TiN)-thin-film technique, no adhesive of any kind is used, as the film is bonded directly onto the sensor material. The sensor is precisely placed, providing long life, stability and high accuracy. The sensor element used in Titanium Nitride (TiN) thin film coating technology is particularly small and compact compared to strain gages, and has impressive specifications in terms of precision and long-term stability. Thin film gauges have been proven to more than a billion cycles on large diesel/gas engines, whereas foil strain gage sensors are typically only rated to one million cycles. In addition, manual placement of the foil strain gage frequently results in foil gage axis misalignment which causes in inaccuracy and off-axis sensitivity. Barksdale high Pressure models over 10KPSI use thin-film and also use more price competitive technologies below 10KPSI.

Available Configurations

Non-Hazardous/Ordinary Locations (Series 450), Intrinsically Safe (Series 450E) and Explosion Proof (Series 450X) offer three base models: 1) 4-20mA with HART® communication. 2) Amplified 4-20mA 3) Amplified 1-5 VDC or optional custom voltage ranges up to 10 VDC (consult factory). In addition, we provide 24 standard ranges from vacuum to 30,000 psi with optional custom pressure ranges. Accuracy level options include 0.25% standard and 0.1% optional.

Multiple electrical connections with optional wire or cable outputs are available for hazardous and non-hazardous applications. Series 450 and 450E models are available with industrial and military style connectors. BiT offers 13 process connections including 17-4 PH stainless steel or optional NACE compliant 316L stainless steel or Inconel material for corrosive production and wellbore environments.

BiT - Series 450X & 450E

Oil & Gas Applications

Barksdale BiT Series Transmitters are designed to be environmentally rugged with a corrosion resistant, all-welded stainless steel design with select standard and optional features to meet varying oil and gas application needs. Mobile equipment applications will be supported with BiT Series global hazardous area certifications which will allow movement of equipment worldwide, while meeting varying country hazardous certification requirements. Hard to reach remote or offshore locations will benefit from digital remote calibration and range turndown capabilities to reduce maintenance time and greatly reduce the need for spares. Oil and gas process applications requiring the monitoring of a high number of pressure points from a central control room will be aided by HART® technology providing remote diagnostics and calibration capability with a unique device ID for quick identification of failed transmitters.

Installation of the HART® transmitter with industry leading compact size will allow higher density mounting in manifolds. In addition, we provide many stainless steel process connections that include NACE compliant corrosive environment materials. 10:1 turndown ratio enabled with HART communication protocol allows consolidation of wide pressure ranges.

Typical applications for 450X explosion proof transmitters include offshore control panels and other O&G process and production equipment requiring cCSAus, cULus, ATEX and IECEx hazardous approvals. O&G Equipment applications include hydraulic and pneumatic control systems, pumps and compressors. 450E Intrinsically Safe transmitters typical applications include cCSAus, ATEX and IECEx approved hazardous mobile or modular equipment requiring setup and breakdown for transport with circular connector and flexible cable convenience.

The new generation 450X series includes global hazardous area certifications, rugged welded construction, high accuracy and compact footprint to meet your Oil & Gas application requirements.

BiT - Series 450

Test & Measurement Applications

BiT Series Transmitter capabilities provide a rugged design platform for product testing and validation where high accuracy and reliable pressure measurement with long term stability are primary considerations. OEM's will benefit from the accuracy and long term stability to reduce calibration cycles required to maintain transmitters used for validating and monitoring product quality and to perform factory acceptance tests. High pressure, high cycle applications including pumps and compressors will benefit from the high cycle capabilities of thin-film sensing technology. Diffused silicon and thin-film technologies come together to provide vacuum to 30,000 psi range and proprietary digital linearization enables accuracies to 0.1% FSO. Test facilities and OEM's requiring a high number of pressure ranges will benefit from optional HART® communication protocol which enables 10:1 turndown of full scale output to reduce inventory cost by meeting multiple pressure range requirements from each transmitter. In addition, turndown range capability can provide over 10X proof pressure for worry-free service life in challenging environments with pressure spikes routinely exceeding the calibrated range. Digital field calibration capability keeps the transmitters in service reducing calibration cycle time and cost. In addition, digital calibration capability eliminates the need for external potentiometers to adjust zero and span, eliminating risk of potentiometer drift with temperature and vibration, and potential of moisture ingress.

450 series applications include non-hazardous industrial engine and pump lube pressure monitoring, test stands and test pressure logging, high cycle testing of pumps and compressors.

The new UL approved 450 series transmitter provides rugged welded construction, high accuracy, long term stability and high cycle capability to meet your Test & Measurement application requirements.

BiT – Barksdale Intelligent Transmitter

Series H455, 455, 452

Features

- Lightweight, compact and all-welded rugged stainless steel construction
- High performance sensors for high accuracy
- Optional HART® communication protocol with diagnostics & field calibration, reducing maintenance time and cost; and 10:1 turndown ratio for re-ranging, maintaining high accuracy and allowing one part number for multiple pressure ranges
- High accuracy: ±0.1% and ±0.25% FSO, (L,H,R)
- cULus Certification for Ordinary Locations
- IP66 & IP67 and NEMA 4X Protection
- CE, CRN, NACE compliant and Superior EMC/EMI protection
- RoHS / REACH Compliant

Applications

- Hydraulic and Pneumatic Product Testing
- Engine Testing
- Hydraulic Equipment
- O&G BOP Pressure Testing
- Acid Pumps
- Data Acquisition System
- Heavy Mobile Equipment Testing
- OEM Factory Acceptance Testing
- Pressure Data Loggers
- Mobile Pressure Test Labs

General Specifications*

Accuracy including Linearity, Hysteresis and Repeatability: at 75°F, Typical	±0.1% of Calibrated FSO (Option [–A1]) ±0.25% of Calibrated FSO (Standard) ±0.5% of Calibrated FSO (Vacuum only [-23])
Temperature Shift:	Zero & Span: 0.0125% Per °F over the compensated temperature range
Long Term Stability:	±0.2% FSO /year of calibration curve
Typical Life Cycle:	100 million cycles
Proof Pressure:	2X range for up to 7500 psi models 1.5X range for 7500 - 30000 psi models
Input: H455: 455*: 452*:	 Excitation voltage: 9 to 30 VDC Excitation voltage: 9 to 30 VDC Excitation voltage: 12 to 30 VDC * (SELV, PELV), Class II Power Supply
Supply Current: H455 & 455: 452:	 20mA max. 20mA max.
Output: H455: 455: 452:	 Output: 4–20 mA with HART® Protocol Full Scale Output: 20 mA ±1% Zero output: 4 mA ±1% Output: 4–20 mA Full Scale Output: 20 mA ±1% Zero output: 4 mA ± 1% Output: 1–5 VDC Full scale output: 5.0 VDC ±1% Zero output: 1.0 VDC ± 1%

Dynamic Response Time: H455: 455 & 452:	 <70 milliseconds <50 milliseconds
Enclosure:	All welded 300 series stainless steel. IP66 & IP67 and NEMA 4X rated. 316 Stainless steel (optional)
Wetted Parts: Sensor: Fitting:	 17-4 PH Stainless steel (more than 10k psi) 316L Stainless steel (up to 10k psi) Inconel (optional: up to 10k psi) 17-4 PH Stainless Steel for -UL option (10k psi) 17-4 PH Stainless steel (all ranges) 316L Stainless steel and 718 Inconel (optional: up to 10k psi)
Media General: Corrosive and Acidic: (up to 10,000 psi)	 Gas, vapor, liquid and viscous fluids [-Z17] 718 Inconel wetted material, NACE [-NC]; and 316L Stainless Steel, NACE [-SS]
Pressure Connection:	13 available options. Refer to product configurator for available connections and ranges.
Electrical Connection:	3 conductors for voltage output series and 2 conductors for current output series, 18 AWG, 80" (2 m) long with integral strain relief and case ground (standard). Jacketed cable (optional). Halogen free wires and cable.
Temperature Ranges: Operating (Ambient): Compensated: Media: Storage:	 -40 to +176 °F (-40 to +80 °C) 0 to +165 °F (-18 to +74 °C) -40 to +176 °F (-40 to +80 °C) -40 to +185 °F (-40 to +85 °C)
Vibration:	10 g's, 10-500 Hz, MIL-STD 202, Method 204, Cond. A
Shock:	50 g's, 11 mS, MIL-STD 202 Method 213, Cond. G.

* See product configurator for additional options.

General Specifications* cont.

Approvals: **cULus:**	cULus approved for ordinary locations (UL 61010-1)
HART® Protocol:	HART® 7.6
Turndown Ratio:	10:1 (Full scale output rangeability)
Analog Output Calibration:	Adjustable zero and span of 4-20mA. Full scale range must be ≥ (calibrated span / 10)
Sensor Trim:	Sensor zero and full scale trim
Diagnostics:	Transmitter failure indicated by off-scale analog signals to alarm the user See HART Installation and Operation Manual 272438 for detailed information
Compliances:	CE, CRN (refer to drawing # 272479 for applicable models) NACE (316L SS or 718 Inconel wetted material)

Electromagnetic Compatibility (EMC) IEC/EN 55011:	Emission & radiated emission for class A limits
IEC/EN 61000-4-2:	Electrostatic discharge (ESD) test - contact discharge +/-4 kV, Air discharge +/-8 kV
IEC/EN 61000-4-3:	Radiated RF, EM field immunity 80mhz-1ghz, 3v/M
IEC/EN 61000-4-4: H455:	EFT (Burst) Test, +/-2 kV
455 & 452:	EFT (Burst) Test, +/-1 kV
IEC/EN 61000-4-5: H455:	Surge Test, +/-1kV between line and earth ground
455 & 452:	Surge test not applicable; Class II power supply used at input of the device
IEC/EN 61000-4-6:	RF Immunity, 150 kHz – 80 MHz, 3V
Weight:	16 Ounces (453 grams)
Warranty:	1 Year warranty

* See product configurator for additional options.

Wiring Code

TABLE 1. FREE LEAD WIRES AND CONNECTOR PIN CONNECTIONS

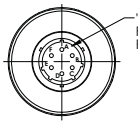
MODEL NO.	RED/A/1	BLACK/B/2	GREEN/D/4	WHITE/C/3
H455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
452	+ EXCITATION	- EXCITATION	EARTH GROUND	VOLTAGE OUTPUT

TABLE 2. JACKETED CABLE WIRE CONNECTIONS (-J Option)

MODEL NO.	WHITE	BROWN	GREEN	YELLOW
H455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
452	+ EXCITATION	- EXCITATION	EARTH GROUND	VOLTAGE OUTPUT

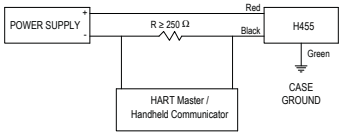
TABLE 3. DEUTSCH CONNECTOR PIN CONNECTIONS (-D3 & -D4 Option)

MODEL NO.	CONNECTOR	PIN A/1	PIN B/2	PIN C/3	PIN D/4
CURRENT	D3	+ EXCITATION	- EXCITATION	EARTH GROUND	N/A
VOLTAGE	D3	+ EXCITATION	- EXCITATION	VOLTAGE OUTPUT	N/A
CURRENT	D4	- EXCITATION	+ EXCITATION	EARTH GROUND	N/A
VOLTAGE	D4	- EXCITATION	+ EXCITATION	VOLTAGE OUTPUT	EARTH GROUND

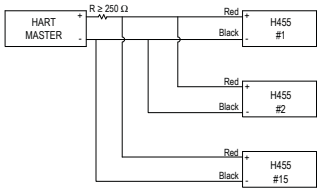


CONFIGURATION WITH HART

Point to Point



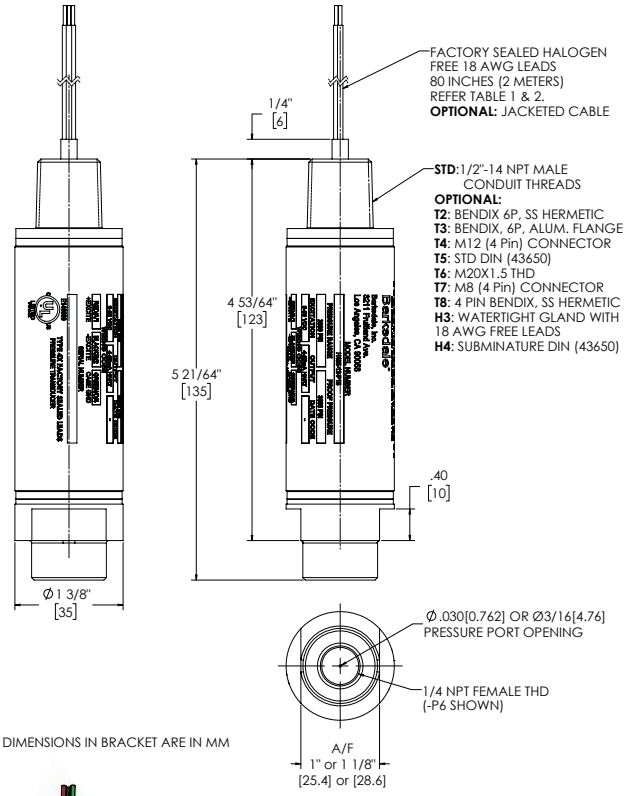
Multi Drop



BiT – Barksdale Intelligent Transmitter

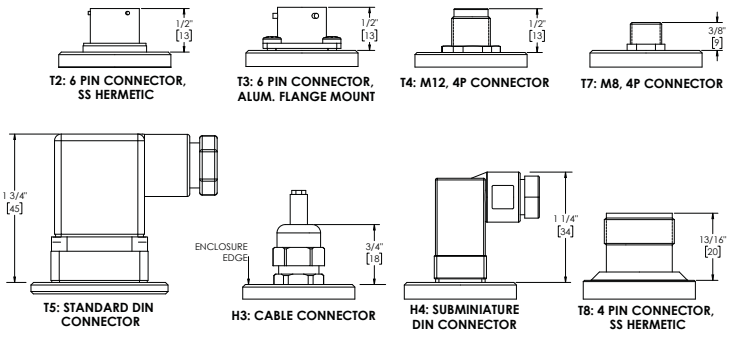
Series H455, 455, 452

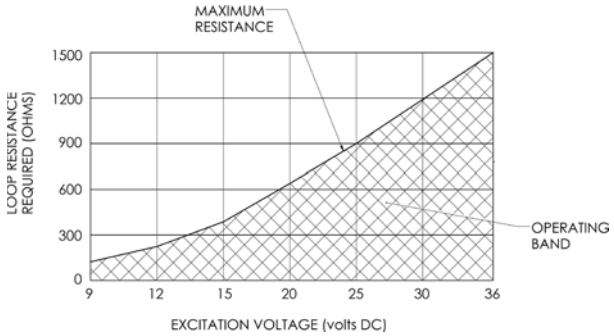
Technical Drawings



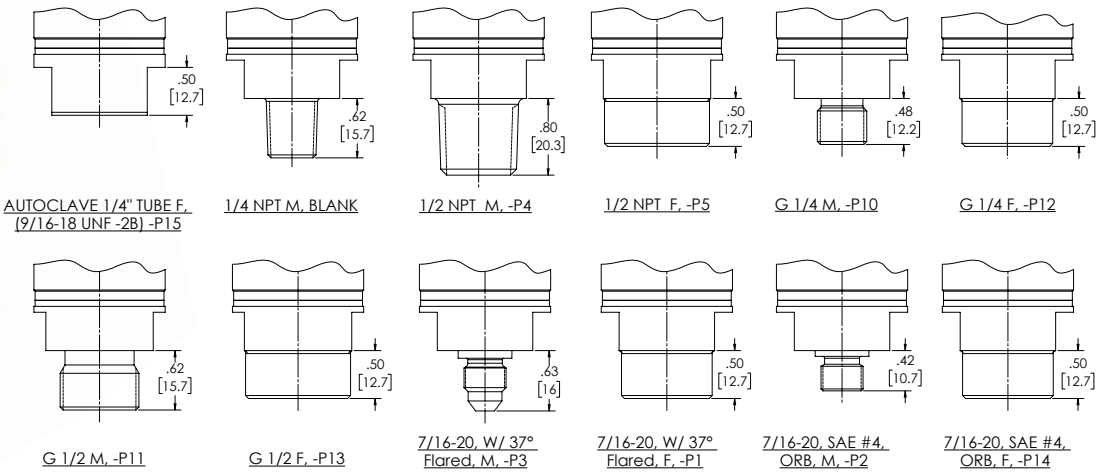
DIMENSIONS IN BRACKET ARE IN MM

Standard and Optional Electrical Connections





Process Connections



CRN DWG #272479 * For ordinary location

BiT – Barksdale Intelligent Transmitter

Series H455, 455, 452

Product Configurator

Example:	H455	T6	-29	BA	-P15	-Z17-A1-Z123

Base Model

H455	4 - 20 mA Output with HART® Comm. Protocol
455	4 - 20 mA Output
452	1-5 VDC Output

Electrical Connection

Blank	1/2"-14 NPT Male conduit
T2	6 pin connector, SS Hermetic, PTIH-10-6P
T3	6 pin connector, Alum. Flange Mount, PT02E-10-6P
T4	M12 (4 Pin) connector
T5	Standard DIN (EN 175301-803, Type A)
T6	M20 x 1.5 Male conduit
T7	M8 (4 Pin) connector
T8	4 pin connector, SS Hermetic, PTIH-14S-2P
H3	Watertight Gland with 18AWG Free Leads
H4	Mini DIN (EN 175301-803, Type C)

Pressure Range

-23*	0-29.9" of Hg	0 to -1 Bar
-01	0-15 psi	0-1 Bar
-21	0-30 psi	0-2 Bar
-03	0-50 psi	0-3 Bar
-22	0-60 psi	0-4 Bar
-04	0-100 psi	0-7 Bar
-05	0-150 psi	0-10 Bar
-06	0-200 psi	0-15 Bar
-07	0-300 psi	0-20 Bar
-08	0-500 psi	0-40 Bar
-10	0-1,000 psi	0-70 Bar
-11	0-1,500 psi	0-100 Bar
-12	0-2,000 psi	0-150 Bar
-13	0-3,000 psi	0-200 Bar
-14	0-4,000 psi	0-300 Bar
-15	0-5,000 psi	0-350 Bar
-16	0-6,000 psi	0-400 Bar
-17	0-7,500 psi	0-500 Bar
-18[7]	0-10,000 psi	0-700 Bar
-29[3]	0-15,000 psi	0-1,000 Bar
-30[3]	0-20,000 psi	0-1,400 Bar
-31[3]	0-22,000 psi	0-1,500 Bar
-32[3]	0-25,000 psi	0-1,700 Bar
-33[3]	0-30,000 psi	0-2,000 Bar

* Vacuum

Pressure Unit & Type

Blank	PSI - Sealed gage pressure (standard)
A	PSI - Absolute pressure (Not applicable with "-23" range)
B	Bar - Sealed gage pressure
BA	Bar - Absolute Pressure (ranges start from -1 Bar) (Not applicable with "-23" range)

Process Connection

Blank[4]	1/4-18 NPT male (standard)
-P6[4]	1/4" NPT female
-P4[4]	1/2" NPT male
-P5[4]	1/2" NPT female
-P10[4]	G 1/4, washer seal, male
-P12[4]	G 1/4, washer seal, female
-P11[4]	G 1/2, washer seal, male
-P13[4]	G 1/2, washer seal, female
-P3[4]	7/16-20, with 37° flared, male
-P1[4]	7/16-20, with 37° flared, female
-P2[4]	7/16-20, SAE #4, ORB, male
-P14[4]	7/16-20, SAE #4, ORB, female
-P15	HF4 Autoclave, 1/4" tube, female (9/16-18 UNF-2B THD)

Options

-ZVxx	Custom voltage output (Available on 452X only). Up to 10VDC. Consult Factory.
-Z17[2]	Larger orifice; without pressure surge protector
-SC[6]	316 Stainless steel enclosure
-SS[4,6]	316L stainless steel wetted material (NACE)
-NC [1,4,5]	718 Inconel wetted material (NACE)
-UL[7]	cULus approval for -18 range (10k psi) only
-A1	Accuracy BFSL 0.1% FSO (LHR) at 75°F (Consult factory on vacuum [-23] models)
-ZXXY	Special pressure ranges XX - significant digits Y - number of trailing zeros Example: 130 psi calibration: add -Z131
-JXXX	Jacketed cable (available on conduit and gland electrical connections) (in inches)
-WXXX	Custom Length of free leads (Available on Conduit and gland electrical connections) (In Inches)
-D3[8]	3 Pin deutsch connector DT04-3P
-D4[8]	4 Pin deutsch connector DT04-4P

Notes

1. No agency approvals
2. All pressure ranges have built-in pressure surge protector. Add "-Z17" suffix for no snubber; for use with high viscosity media. Refer to Sales drawing for orifice sizes.
3. Ranges with more than 10k psi are available only with -P15 Process Connection
4. Available up to 10,000 psi
5. "–NC" option only available with following pressure ranges: -11, -13, -16 and -18. Consult factory for availability on other pressure ranges. Not available for Vacuum [-23] range and Absolute models [A] & [BA].
6. -SS option is included in -SC option. -SC does not include material of electrical connection."-UL" option and more than 10k psi ranges only with 17-4PH SS wetted material.
7. -UL option only available for 10,000 psi range. No cULus approval for 10,000 psi range without -UL suffix option. cULus approval standard for all other ranges. -UL only with 17-4 PH SS wetted material
8. Connected to factory sealed halogen free, 18 AWG free leads 12" (.3m). Also available with -WXXX and -JXXX options.

Additional Documents and Accessories

Title	Reference Number
Installation and Maintenance Instructions	272441
HART Installation and Operation Manual	272438
Cable & Connectors	Cable & Connectors. Bulletin #S0115-C
Certificate of Compliance (Found on back of packing slip)	Use Document Title in purchase order. Only available at the time of order.
Certificate of Compliance (Signed document)	
Test Report	
Calibration Test Sheet (Included in product package)	
Material Certification	
Paper Tag	
Metal Tag	

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BiT – Barksdale Intelligent Transmitter *Series H455X, 455X, 452X*

Features

- Lightweight, compact and all-welded rugged stainless steel construction
- High performance sensors for high accuracy
- Optional HART® communication protocol with diagnostics & field calibration, reducing maintenance time and cost; and 10:1 turndown ratio for re-ranging, maintaining high accuracy and allowing one part number for multiple pressure ranges
- High accuracy: ±0.1% and ±0.25% FSO, (L,H,R)
- cULus, ATEX, IECEx and Single Seal certifications
- Explosion proof enclosure with IP66 & IP67 and NEMA 4X, 7 & 9 ratings
- CE, CRN, and NACE compliant and superior EMI/EMC protection
- Factory sealed, environment friendly, halogen free wires and cable
- RoHS & REACH Compliant

Applications

- Production Control Systems
- Chemical Injection Systems
- Oil & gas pipelines
- Petrochemical plants
- Refineries
- Coal and oil fired power plants
- Hydraulic Power Units
- Gas transfers for fuel systems

General Specifications*

Accuracy including Linearity, Hysteresis and Repeatability: at 75°F, Typical	±0.1% of Calibrated FSO (Option [–A1]) ±0.25% of Calibrated FSO (Standard) ±0.5% of Calibrated FSO (Vacuum only [-23])
Temperature Shift:	Zero & Span: 0.0125% Per °F over the compensated temperature range
Long Term Stability:	±0.2% FSO/year of calibration curve
Typical Life Cycle:	100 million cycles
Proof Pressure:	2X range for up to 7500 psi models 1.5X range for 7500 - 30000 psi models
Input: H455X: 455X*: 452X*:	 Excitation voltage: 9 to 30 VDC Excitation voltage: 9 to 30 VDC Excitation voltage: 12 to 30 VDC * (SELV, PELV), Class II Power Supply
Supply Current: H455X & 455X: 452X:	 20 mA max. 20 mA max.
Output: H455X: 455X: 452X:	 Output: 4–20 mA with HART® Protocol Full Scale Output: 20 mA ±1% Zero output: 4 mA ±1% Output: 4–20 mA Full Scale Output: 20 mA ±1% Zero output: 4 mA ± 1% Output: 1–5 VDC Full scale output: 5.0 VDC ±1% Zero output: 1.0 VDC ± 1%

Dynamic Response Time: H455X: 455X & 452X:	 <70 milliseconds <50 milliseconds
Enclosure:	All welded 300 series stainless steel. IP66 & IP67 and NEMA 4X rated. 316 Stainless Steel (optional)
Wetted Parts: Sensor: Fitting:	 17-4 PH Stainless steel (more than 10k psi) 316L Stainless steel (up to 10k psi) 17-4 PH Stainless Steel for -UL option (10k psi) 17-4 PH Stainless steel (all ranges) 316L Stainless steel (optional: up to 10k psi)
Media General: Corrosive and Acidic: (up to 10,000 psi)	 Gas, vapor, liquid and viscous fluids [-Z17] 316L Stainless Steel, NACE [-SS]
Pressure Connection:	13 available options. Refer to product configurator for available connections and ranges. 3 and 4 pin Deutsch connector (optional)
Electrical Connection:	3 conductors for voltage output series and 2 conductors for current output series, 18 AWG, 80" (2 m) long with integral strain relief and case ground (standard). Jacketed cable (optional). Halogen free wires and cable.
Temperature Ranges: Operating (Ambient): Compensated: Media: Storage:	 -40 to +176 °F (-40 to +80 °C) 0 to +165 °F (-18 to +74 °C) -40 to +176 °F (-40 to +80 °C) -40 to +185 °F (-40 to +85 °C)
Vibration:	10 g's, 10-500 Hz, MIL-STD 202, Method 204, Cond A.
Shock:	50 g's, 11 mS, MIL-STD 202 Method 213, Cond. G.

* See product configurator for additional options.

General Specifications* cont.

Approvals: **cULus:**	cULus approved for ordinary locations (UL 61010-1)
HART® Protocol:	HART® 7.6
Turndown Ratio:	10:1 (Full scale output rangeability)
Analog Output Calibration:	Adjustable zero and span of 4-20mA. Full scale range must be ≥ (calibrated span / 10)
Sensor Trim:	Sensor zero and full scale trim
Diagnostics:	Transmitter failure indicated by off-scale analog signals to alarm the user See HART Installation and Operation Manual 272438 for detailed information
Compliances:	CE, CRN (refer to drawing # 272479 for applicable models) NACE (316L SS or 718 Inconel wetted material)

Electromagnetic Compatibility (EMC) IEC/EN 55011:	Emission & radiated emission for class A limits
IEC/EN 61000-4-2:	Electrostatic discharge (ESD) test - contact discharge +/-4 kV, Air discharge +/-8 kV
IEC/EN 61000-4-3:	Radiated RF, EM field immunity 80mhz-1ghz, 3v/M
IEC/EN 61000-4-4: H455:	EFT (Burst) Test, +/-2 kV
455 & 452:	EFT (Burst) Test, +/-1 kV
IEC/EN 61000-4-5: H455:	Surge Test, +/-1kV between line and earth ground
455 & 452:	Surge test not applicable; Class II power supply used at input of the device
IEC/EN 61000-4-6:	RF Immunity, 150 kHz – 80 MHz, 3V
Weight:	16 Ounces (453 grams)
Warranty:	1 Year warranty

* See product configurator for additional options.

Wiring Code

TABLE 1. FREE LEAD WIRES AND CONNECTOR PIN CONNECTIONS

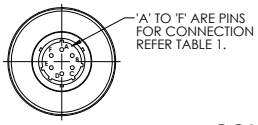
MODEL NO.	RED/A/1	BLACK/B/2	GREEN/D/4	WHITE/C/3
H455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
452	+ EXCITATION	- EXCITATION	EARTH GROUND	VOLTAGE OUTPUT

TABLE 2. JACKETED CABLE WIRE CONNECTIONS (-J Option)

MODEL NO.	WHITE	BROWN	GREEN	YELLOW
H455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
452	+ EXCITATION	- EXCITATION	EARTH GROUND	VOLTAGE OUTPUT

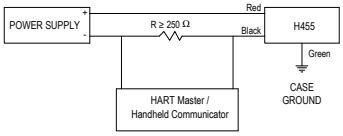
TABLE 3. DEUTSCH CONNECTOR PIN CONNECTIONS (-D3 & -D4 Option)

MODEL NO.	CONNECTOR	PIN A/1	PIN B/2	PIN C/3	PIN D/4
CURRENT	D3	+ EXCITATION	- EXCITATION	EARTH GROUND	N/A
VOLTAGE	D3	+ EXCITATION	- EXCITATION	VOLTAGE OUTPUT	N/A
CURRENT	D4	- EXCITATION	+ EXCITATION	EARTH GROUND	N/A
VOLTAGE	D4	- EXCITATION	+ EXCITATION	VOLTAGE OUTPUT	EARTH GROUND

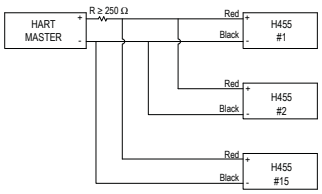


CONFIGURATION WITH HART

Point to Point

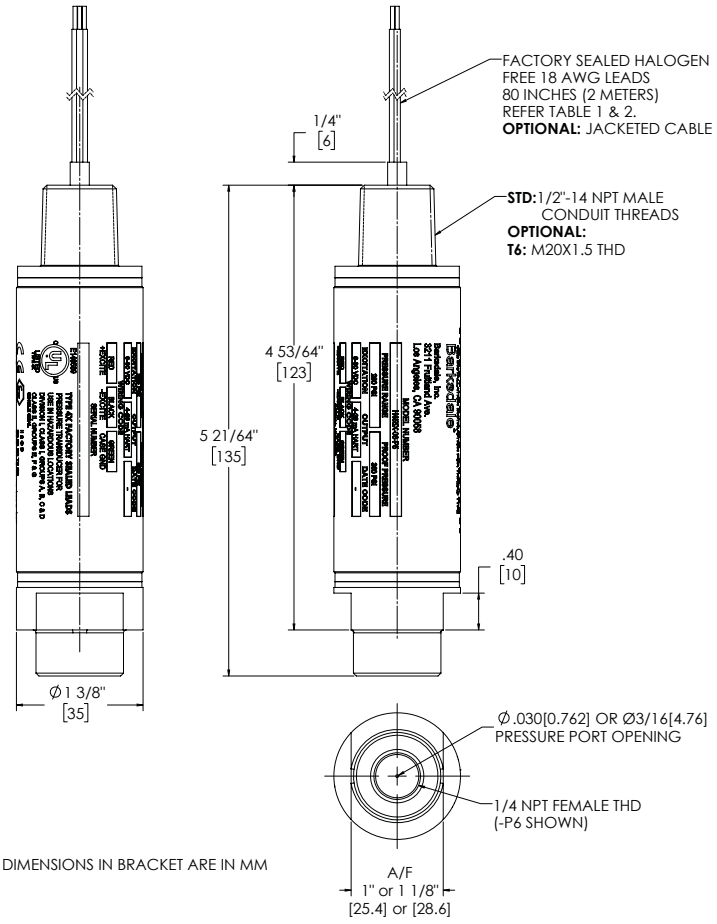


Multi Drop

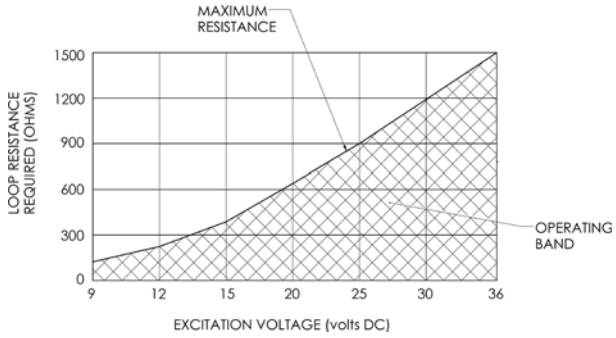


BiT – Barksdale Intelligent Transmitter *Series H455X, 455X, 452X*

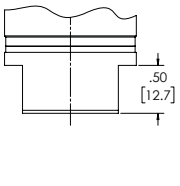
Technical Drawings



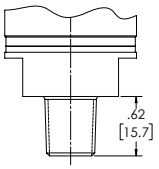
DIMENSIONS IN BRACKET ARE IN MM



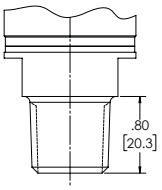
Process Connections



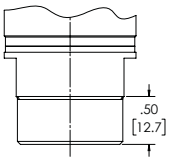
AUTOCLAVE 1/4" TUBE F,
(9/16-18 UNF -2B) -P15



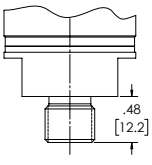
1/4 NPT M, BLANK



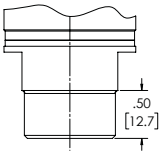
1/2 NPT M, -P4



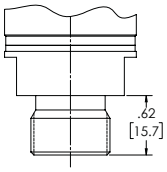
1/2 NPT F, -P5



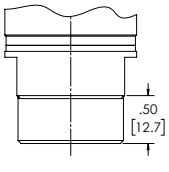
G 1/4 M, -P10



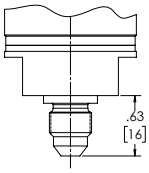
G 1/4 F, -P12



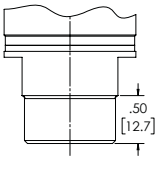
G 1/2 M, -P11



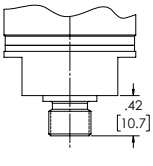
G 1/2 F, -P13



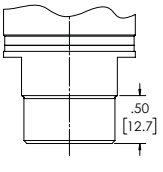
7/16-20, W/ 37°
Flared, M, -P3



7/16-20, W/ 37°
Flared, F, -P1



7/16-20, SAE #4,
ORB, M, -P2



7/16-20, SAE #4,
ORB, F, -P14

CRN
DWG #272479

BiT – Barksdale Intelligent Transmitter *Series H455X, 455X, 452X*

Product Configurator

Example:	H455X	T6	-29	BA	-P15	-Z17-A1-Z123

Base Model

H455X	4 - 20 mA Output with HART® Comm. Protocol
455X	4 - 20 mA Output
452X	1-5 VDC Output

Electrical Connection

Blank	1/2"-14 NPT Male conduit
T6	M20 x 1.5 Male conduit

Pressure Range

-23*	0-29.9" of Hg	0 to -1 Bar
-01	0-15 psi	0-1 Bar
-21	0-30 psi	0-2 Bar
-03	0-50 psi	0-3 Bar
-22	0-60 psi	0-4 Bar
-04	0-100 psi	0-7 Bar
-05	0-150 psi	0-10 Bar
-06	0-200 psi	0-15 Bar
-07	0-300 psi	0-20 Bar
-08	0-500 psi	0-40 Bar
-10	0-1,000 psi	0-70 Bar
-11	0-1,500 psi	0-100 Bar
-12	0-2,000 psi	0-150 Bar
-13	0-3,000 psi	0-200 Bar
-14	0-4,000 psi	0-300 Bar
-15	0-5,000 psi	0-350 Bar
-16	0-6,000 psi	0-400 Bar
-17	0-7,500 psi	0-500 Bar
-18[5]	0-10,000 psi	0-700 Bar
-29[2]	0-15,000 psi	0-1,000 Bar
-30[2]	0-20,000 psi	0-1,400 Bar
-31[2]	0-22,000 psi	0-1,500 Bar
-32[2]	0-25,000 psi	0-1,700 Bar
-33[2]	0-30,000 psi	0-2,000 Bar

* Vacuum

Pressure Unit & Type

Blank	PSI - Sealed gage pressure (standard)
A	PSI - Absolute pressure (Not applicable with "-23" range)
B	Bar - Sealed gage pressure
BA	Bar - Absolute Pressure (ranges start from -1 Bar) (Not applicable with "-23" range)

Process Connection

Blank[3]	1/4-18 NPT male (standard)
-P6[3]	1/4" NPT female
-P4[3]	1/2" NPT male
-P5[3]	1/2" NPT female
-P10[3]	G 1/4, washer seal, male
-P12[3]	G 1/4, washer seal, female
-P11[3]	G 1/2, washer seal, male
-P13[3]	G 1/2, washer seal, female
-P3[3]	7/16-20, with 37° flared, male
-P1[3]	7/16-20, with 37° flared, female
-P2[3]	7/16-20, SAE #4, ORB, male
-P14[3]	7/16-20, SAE #4, ORB, female
-P15	HF4 Autoclave, 1/4" tube, female (9/16-18 UNF-2B THD)

Options

-ZVxx	Custom voltage output (Available on 452X only). Up to 10VDC. Consult Factory.
-Z17[1]	Larger orifice; without pressure surge protector
-SC[4]	316 Stainless steel enclosure
-SS[3,4]	316L Stainless steel wetted material (NACE)
-UL[5]	cULus in addition to ATEX & IECEx approvals for -18 range (10k psi) only
-A1	Accuracy BFSL 0.1% FSO, typical (LHR) at 75°F (Consult factory on vacuum [-23] models)
-ZXXY	Special pressure ranges XX - significant digits Y - number of trailing zeros Example: 130 psi calibration: add -Z131
-JXXX	Jacketed cable (in inches)
-WXXX	Custom length of free leads (in inches)
-D3[6]	3 Pin deutsch connector DT04-3P
-D4[6]	4 Pin deutsch connector DT04-4P

Notes

1. All pressure ranges have built-in pressure surge protector. Add "-Z17" suffix for no snubber; for use with high viscosity media. Refer to sales drawing for orifice sizes.
2. Ranges with more than 10k psi are available only with "-P15" Process Connection
3. Available up to 10,000 psi
4. -SS option is included in -SC option. -SC does not Include material of electrical connection. "-UL" option and more than 10k psi ranges only with 17-4PH SS wetted material.
5. -UL option only available for 10,000 PSI range. No cULus approval for 10,000 psi range without -UL option. cULus approval standard for all other ranges. ATEX & IECEx approvals standard for all ranges. "-UL" only with 17-4 PH SS wetted material
6. Connected to factory sealed halogen free, 18 AWG free leads 12" (.3m). Also available with -WXXX and -JXXX options.

Additional Documents and Accessories

Title	Reference Number
Installation and Maintenance Instructions	272439
HART Installation and Operation Manual	272438
Certificate of Compliance (Found on back of packing slip)	Use Document Title in purchase order. Only available at the time of order.
Certificate of Compliance (Signed document)	
Test Report	
Calibration Test Sheet (Included in product package)	
Material Certification	
Paper Tag	
Metal Tag	

R0047-D • 01/20

BiT – Barksdale Intelligent Transmitter

Series H455E, 455E

Features

- Intrinsic safety certification with ATEX, IECEx and CSA approvals
- Lightweight, compact and all-welded rugged stainless steel construction
- High performance sensors
- Optional HART® communication protocol with diagnostics & field calibration, reducing maintenance time and cost; 10:1 turndown ratio for re-ranging, maintaining high accuracy and allowing one part number for multiple pressure ranges
- High accuracy: ±0.1% and 0.25% FSO, (L,H,R)
- Additional CSA certification for ordinary locations
- Factory sealed IP66 & IP67 and NEMA 4X enclosure
- CE, NACE compliant and superior EMC/EMI protection
- RoHS / REACH Compliant

Applications

- Drilling rig control & monitoring instrumentation
- Drilling and frac offshore equipment skids
- Production control systems
- Chemical injection systems
- Oil & gas pipelines
- Petrochemical plants
- Refineries
- Gas and oil fired power plants
- Hydraulic power units
- Gas transfers for fuel systems
- O&G process pumps
- Gas compressors
- Generators and turbines

General Specifications*

Accuracy including Linearity, Hysteresis and Repeatability: at 75°F, Typical	±0.1% of Calibrated FSO (Option [–A1]) ±0.25% of Calibrated FSO (Standard) ±0.5% of Calibrated FSO (Vacuum only [-23])
Temperature Shift:	Zero & Span: 0.0125% Per °F over the compensated temperature range
Long Term Stability:	±0.2% FSO /year of calibration curve
Typical Life Cycle:	100 million cycles
Proof Pressure:	2X range for up to 7500 psi models 1.5X range for 7500 - 30000 psi models
Input:	Excitation voltage: 9 to 30 VDC
Supply Current:	20mA max.
Output: H455E: 455E:	 Output: 4–20 mA with HART® Protocol Full Scale Output: 20 mA ±1% Zero output: 4 mA ±1% Output: 4–20 mA Full Scale Output: 20 mA ±1% Zero output: 4 mA ± 1%
Dynamic Response Time:	<70 milliseconds
Enclosure:	All welded 300 series stainless steel. IP66 & IP67 and NEMA 4X rated. 316 Stainless Steel (optional)

Wetted Parts: Sensor: Fitting:	 17-4 PH Stainless steel (more than 10k psi) 316L Stainless steel (up to 10k psi) Inconel (optional: up to 10k psi) 17-4 PH Stainless steel for -UL option (10k psi) 17-4 PH Stainless steel (all ranges) 316L Stainless steel and 718 Inconel (optional: up to 10k psi)
Media General: Corrosive and Acidic: (up to 10,000 psi)	 Gas, vapor, liquid and viscous fluids [-Z17] 718 Inconel wetted material, NACE [-NC], and 316L stainless steel, NACE [-SS]
Pressure Connection:	13 available options. Refer to product configurator for available connections and ranges.
Electrical Connection:	10 available electrical connections such as M12, Bendix, DIN, conduit, gland and etc. Option for free leads from conduit or gland electrical connection includes two signal leads plus ground lead consisting of 18AWG halogen free type, 80" (2m) long or optional jacketed cable exiting 1/2 NPT or M20 conduit or gland connections.
Temperature Ranges: Operating (Ambient): Compensated: Media: Storage:	 -40 to +176 °F (-40 to +80 °C) 0 to +165 °F (-18 to +74 °C) -40 to +176 °F (-40 to +80 °C) -40 to +185 °F (-40 to +85 °C)
Vibration:	10 g's, 10-500 Hz, MIL-STD 202, Method 204, Cond. A
Shock:	50 g's, 11 mS, MIL-STD 202 Method 213, Cond. G.

* See product configurator for additional options.

General Specifications* cont.

Approvals:	
CSA	**cCSAus** Ordinary Locations
CSA	**cCSAus** Intrinsic Safety for Hazardous Locations Class I, Div. 1, Groups A, B, C & D Class II, Div. 1, Groups E, F & G Ex ia IIC T4 Ga Ex ia IIIC T135°C Da Class 1 Zone 0, AEx ia IIC T4 Ga Zone 20 AEx ia IIIC T135°C Da Factory sealed IP66 & IP67 and NEMA 4X enclosure
ATEX/IECEx:	CE 0081 Ex II 1 G D Ex ia IIC T4 Ga Ex ia IIIC T135°C Da, IP66 & IP67 -40 °C ≤ Tamb ≤ +80 °C CML 19 ATEX 2240X IECEx CML 19.0066X
HART® Protocol:	HART® 7.6
Turndown Ratio:	10:1 (Full scale output rangeability)
Analog Output Calibration:	Adjustable zero and span of 4-20mA. Full scale range must be ≥ (calibrated span / 10)
Sensor Trim:	Sensor zero and full scale trim
Diagnostics:	Transmitter failure indicated by off-scale analog signals to alarm the user See HART Installation and Operation Manual 272438 for detailed information

Compliances:	CE, NACE (316L SS or 718 Inconel wetted material)
Electromagnetic Compatibility (EMC)	
IEC/EN 55011:	Emission & radiated emission for class A limits
IEC/EN 61000-4-2:	Electrostatic discharge (ESD) test - contact discharge +/-4 kV, Air discharge +/-8 kV
IEC/EN 61000-4-3:	Radiated RF, EM field immunity 80mhz-1ghz, 3v/M
IEC/EN 61000-4-4:	EFT (Burst) Test, +/-2 kV
IEC/EN 61000-4-5:	Surge Test, +/-1kV between line and earth ground
IEC/EN 61000-4-6:	RF Immunity, 150 kHz – 80 MHz, 3V
Weight:	16 Ounces (453 grams)
Warranty:	1 year warranty

* See product configurator for additional options.

Installation: Intrinsic Safety Installation for Hazardous Locations: Install per Barksdale Control Drawing 272471

I.S. Entity Parameters	Supply/Signal Barrier		PressureTransmitter		
	Vmax (Ui)	Imax	Ci	Li	Pi max
	30 VDC	100 mA	2.2 nF	30 µH	750 mW

Wiring Code

TABLE 1. FREE LEAD WIRES AND CONNECTOR PIN CONNECTIONS

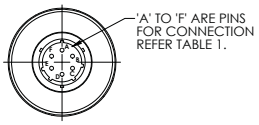
MODEL NO.	RED/A/1	BLACK/B/2	GREEN/D/4
H455E	+ EXCITATION	- EXCITATION	EARTH GROUND
455E	+ EXCITATION	- EXCITATION	EARTH GROUND

TABLE 2. JACKETED CABLE WIRE CONNECTIONS (-J Option)

MODEL NO.	WHITE	BROWN	GREEN
H455E	+ EXCITATION	- EXCITATION	EARTH GROUND
455E	+ EXCITATION	- EXCITATION	EARTH GROUND

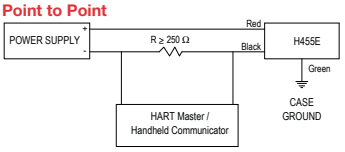
TABLE 3. DEUTSCH CONNECTOR PIN CONNECTIONS (-D3 & -D4 Option)

MODEL NO.	CONNECTOR	PIN A/1	PIN B/2	PIN C/3	PIN D/4
H455E & 455E	D3	+ EXCITATION	- EXCITATION	EARTH GROUND	N/A
H455E & 455E	D4	- EXCITATION	+ EXCITATION	EARTH GROUND	N/A

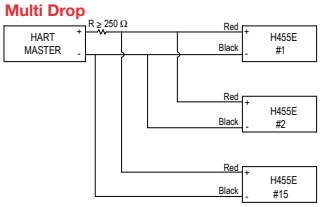


CONFIGURATION WITH HART®

Point to Point



Multi Drop

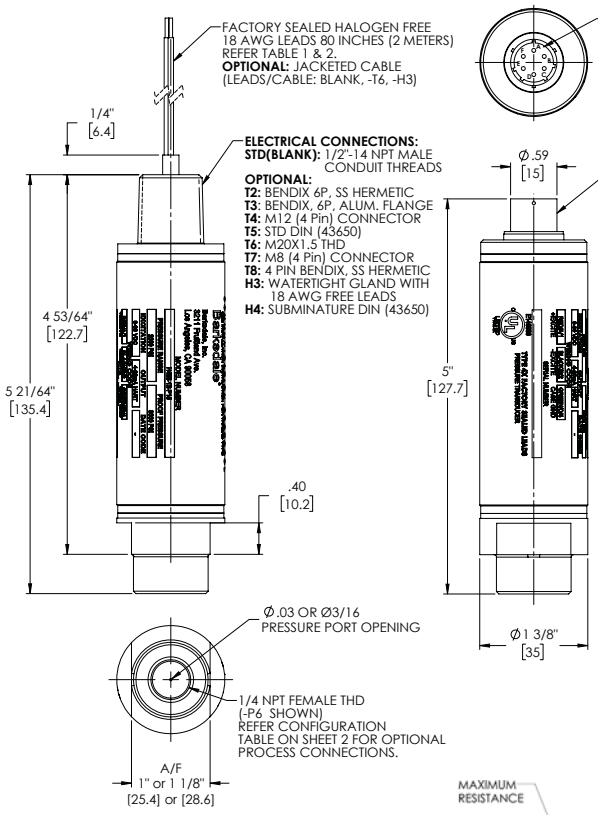


BiT – Barksdale Intelligent Transmitter

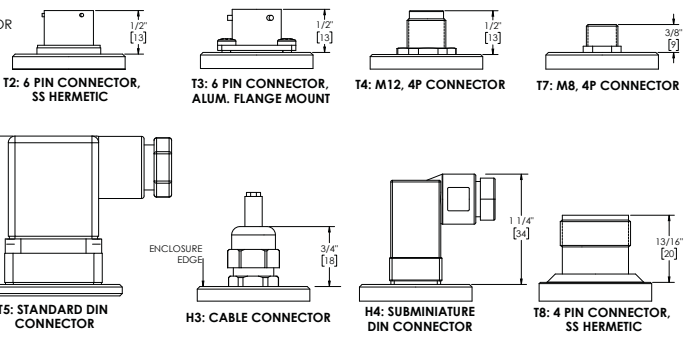
Series H455E, 455E

Technical Drawings

DIMENSIONS IN BRACKET ARE IN MM

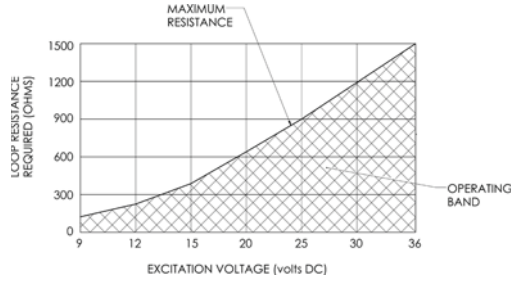


Standard and Optional Electrical Connections

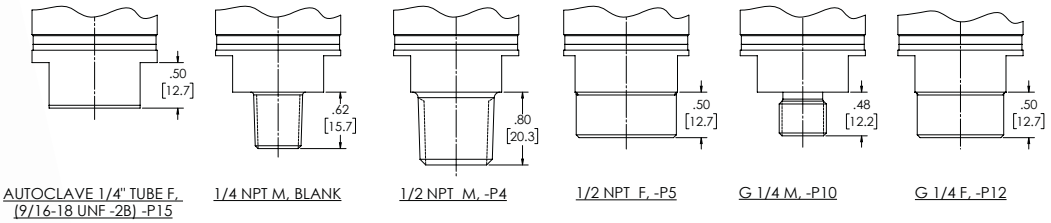


-D3 CONNECTOR OPTION

-D4 CONNECTOR OPTION WITH WATERTIGHT GLAND (H3)



Process Connections



C US IEC IECEx CE HART COMMUNICATION PROTOCOL NACE INTERNATIONAL

BiT – Barksdale Intelligent Transmitter

Series H455E, 455E

Product Configurator

Example:	H455E	T6	-29	BA	-P15	-Z17-A1-Z123

Base Model

H455E	4 - 20 mA Output with HART® Comm. Protocol
455E	4 - 20 mA Output

Electrical Connection

Blank	1/2"-14 NPT Male conduit
T2	6 pin connector, SS Hermetic, PTIH-10-6P
T3	6 pin connector, Alum. Flange Mount, PT02E-10-6P
T4	M12 (4 Pin) connector
T5	Standard DIN (EN 175301-803, Type A)
T6	M20 x 1.5 Male conduit
T7	M8 (4 Pin) connector
T8	4 pin connector, SS Hermetic, PTIH-14S-2P
H3	Watertight Gland with 18AWG Free Leads
H4	Mini DIN (EN 175301-803, Type C)

Pressure Range

-23*	0-29.9" of Hg	0 to -1 Bar
-01	0-15 psi	0-1 Bar
-21	0-30 psi	0-2 Bar
-03	0-50 psi	0-3 Bar
-22	0-60 psi	0-4 Bar
-04	0-100 psi	0-7 Bar
-05	0-150 psi	0-10 Bar
-06	0-200 psi	0-15 Bar
-07	0-300 psi	0-20 Bar
-08	0-500 psi	0-40 Bar
-10	0-1,000 psi	0-70 Bar
-11	0-1,500 psi	0-100 Bar
-12	0-2,000 psi	0-150 Bar
-13	0-3,000 psi	0-200 Bar
-14	0-4,000 psi	0-300 Bar
-15	0-5,000 psi	0-350 Bar
-16	0-6,000 psi	0-400 Bar
-17	0-7,500 psi	0-500 Bar
-18[1]	0-10,000 psi	0-700 Bar
-29[3]	0-15,000 psi	0-1,000 Bar
-30[3]	0-20,000 psi	0-1,400 Bar
-31[3]	0-22,000 psi	0-1,500 Bar
-32[3]	0-25,000 psi	0-1,700 Bar
-33[3]	0-30,000 psi	0-2,000 Bar

* Vacuum

Pressure Unit & Type

Blank	PSI - Gauge pressure (standard)
A	PSI - Absolute pressure (Not applicable with "-23" range)
B	Bar - Gauge Pressure
BA	Bar - Absolute Pressure (ranges start from -1 Bar) (Not applicable with "-23" range)

Process Connection

Blank[4]	1/4-18 NPT male (standard)
-P6[4]	1/4" NPT female
-P4[4]	1/2" NPT male
-P5[4]	1/2" NPT female
-P10[4]	G 1/4, washer seal, male
-P12[4]	G 1/4, washer seal, female
-P11[4]	G 1/2, washer seal, male
-P13[4]	G 1/2, washer seal, female
-P3[4]	7/16-20, with 37° flared, male
-P1[4]	7/16-20, with 37° flared, female
-P2[4]	7/16-20, SAE #4, ORB, male
-P14[4]	7/16-20, SAE #4, ORB, female
-P15	HF4 Autoclave, 1/4" tube, female (9/16-18 UNF-2B THD)

Options

-ZVxx	Custom voltage output (Available on 452X only). Up to 10VDC. Consult Factory.
-Z17[2]	For high pressure models with larger orifice; without pressure surge protector
-SC[6]	All 316 stainless steel construction with 316L SS wetted material (NACE)
-SS[4,6]	316L stainless steel wetted material (NACE)
-NC[4,5]	718 Inconel wetted material (NACE)
-UL[1]	cCSAus approval, only for 10k psi "-18" range. Includes ATEX & IECEX approvals.
-A1	Accuracy BFSL 0.1% FSO (LHR) at 75°F (Consult factory on vacuum [-23] models)
-ZXXY	Special pressure ranges XX - significant digits Y - number of trailing zeros Example: 130 psi calibration: add -Z131
-JXXX	Jacketed cable (available on conduit and gland electrical connections) (in inches)
-WXXX	Custom Length of free leads (Available on Conduit and gland electrical connections) (In Inches)
-D3[7]	3 Pin deutsch connector DT04-3P
-D4[7]	4 Pin deutsch connector DT04-4P

Notes

1. -UL option only available for 10,000 psi range. No cCSAus approval for 10,000 psi range without -UL suffix option. cCSAus approval standard for all other ranges
2. All pressure ranges have built-in pressure surge protector. Add "-Z17" suffix for high pressure models with no snubber; for use with high viscosity media. Refer to Sales drawing for orifice sizes.
3. Ranges with more than 10k psi are only available with -P15 Process Connection
4. Available up to 10,000 psi
5. "–NC" option only available with following pressure ranges: -11, -13, -16 and -18. Consult factory for availability on other pressure ranges. Not available for Vacuum [-23] range and Absolute models [A] & [BA].
6. -SS option is included in -SC option. -SC does not include material of electrical connection. -UL option and ranges that are more than 10k psi are only available with 17-4PH SS wetted material.
7. Connected to factory sealed halogen free, 18 AWG free leads 12" (.3m). Also available with -WXXX and -JXXX options.

Additional Documents & Accessories

Title	Reference Number
Installation and Maintenance Instructions, Control Drawing	272441, 272471
HART Installation and Operation Manual	272438
Cable & Connectors	Cable & Connectors. Bulletin #S0115-C
Certificate of Compliance (Found on back of packing slip)	Use Document Title in purchase order. Only available at the time of order.
Certificate of Compliance (Signed document)	
Test Report	
Calibration Test Sheet (Included in product package)	
Material Certification	
Paper Tag	
Metal Tag	

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