

# 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:  $\pm 0.1\%$  and  $\pm 0.25\%$  FSO, (L,H,R)
- ▶ cULus Certification for Ordinary Locations & DNV Approval
- ▶ 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	$\pm 0.1\%$ of Calibrated FSO (Option [-A1]) $\pm 0.25\%$ of Calibrated FSO (Standard) $\pm 0.5\%$ of Calibrated FSO (Vacuum only [-23])	Dynamic Response Time: H455: 455 & 452:	<70 milliseconds <50 milliseconds
Temperature Shift:	Zero & Span: 0.0125% Per °F over the compensated temperature range	Enclosure:	All welded 300 series stainless steel. IP66 & IP67 and NEMA 4X rated. 316 Stainless steel (optional)
Long Term Stability:	$\pm 0.2\%$ FSO /year of calibration curve	Wetted Parts: Sensor:	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)
Typical Life Cycle:	100 million cycles	Fitting:	17-4 PH Stainless steel (all ranges) 316L Stainless steel (up to 10k psi [-SS or -SC])
Proof Pressure:	2X range for up to 7500 psi models 1.5X range for 7500 - 30000 psi models	Media General:	Gas, vapor, liquid and viscous fluids [-Z17]
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	Corrosive and Acidic: (up to 10,000 psi)	316L Stainless Steel fitting, NACE [-SS or -SC]
Supply Current:		Pressure Connection:	13 available options. Refer to product configurator for available connections and ranges.
H455 & 455:	20mA max.	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.
452:	20mA max.	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)
Output: H455:	Output: 4–20 mA with HART® Protocol Full Scale Output: 20 mA $\pm 1\%$ Zero output: 4 mA $\pm 1\%$	Vibration:	10 g's, 10-500 Hz, MIL-STD 202, Method 204, Cond. A
455:	Output: 4–20 mA Full Scale Output: 20 mA $\pm 1\%$ Zero output: 4 mA $\pm 1\%$	Shock:	50 g's, 11 mS, MIL-STD 202 Method 213, Cond. G.
452:	Output: 1–5 VDC Full scale output: 5.0 VDC $\pm 1\%$ Zero output: 1.0 VDC $\pm 1\%$		

\* See product configurator for additional options.

## General Specifications\* cont.

Approvals: cULus:	cULus approved for ordinary locations (UL 61010-1)	Electromagnetic Compatibility (EMC) IEC/EN 55011:	Emission & radiated emission for class A limits
DNV	Type Approval		
HART® Protocol:	HART® 7.6	IEC/EN 61000-4-2:	Electrostatic discharge (ESD) test - contact discharge +/-4 kV, Air discharge +/-8 kV
Turndown Ratio:	10:1 (Full scale output rangeability)	IEC/EN 61000-4-3:	Radiated RF, EM field immunity 80mhz-1ghz, 3v/M
Analog Output Calibration:	Adjustable zero and span of 4-20mA. Full scale range must be ≥ (calibrated span / 10)	IEC/EN 61000-4-4: H455:	EFT (Burst) Test, +/-2 kV
Sensor Trim:	Sensor zero and full scale trim	455 & 452:	EFT (Burst) Test, +/-1 kV
Diagnostics:	Transmitter failure indicated by off-scale analog signals to alarm the user	IEC/EN 61000-4-5: H455:	Surge Test, +/-1kV between line and earth ground
	See HART Installation and Operation Manual 272438 for detailed information	455 & 452:	Surge test not applicable; Class II power supply used at input of the device
Compliances:	CE, CRN (refer to drawing # 272479 for applicable models) NACE (316L SS wetted material)	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

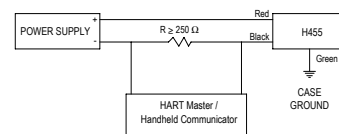


TABLE 2. JACKETED CABLE WIRE CONNECTIONS (-J Option)				
MODEL NO.	WHITE	BROWN	GREEN	YELLOW
H455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
455	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
452	+ EXCITATION	- EXCITATION	EARTH GROUND	VOLTAGE OUTPUT

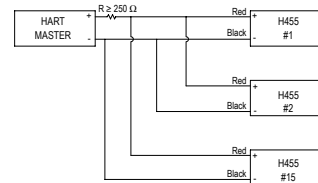
TABLE 3. DEUTSCH CONNECTOR PIN CONNECTIONS (-D3 & -D4 Option)					
MODEL NO.	CONNECTOR	PIN A/1	PIN B/2	PIN C/3	PIN D/4
CURRENT	D3	+ EXCITATION	- EXCITATION	EARTH GROUND	N/A
VOLTAGE	D3	+ EXCITATION	- EXCITATION	VOLTAGE OUTPUT	N/A
CURRENT	D4	- EXCITATION	+ EXCITATION	EARTH GROUND	N/A
VOLTAGE	D4	- EXCITATION	+ EXCITATION	VOLTAGE OUTPUT	EARTH GROUND

### CONFIGURATION WITH HART

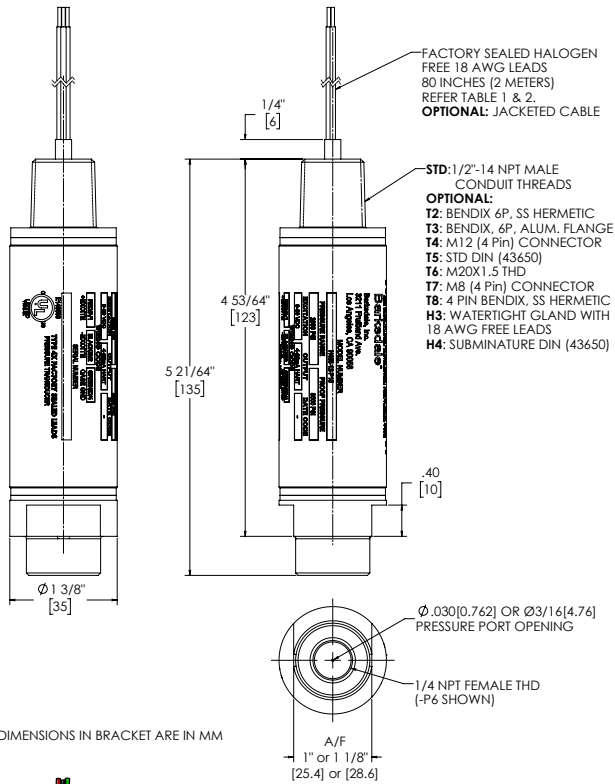
Point to Point



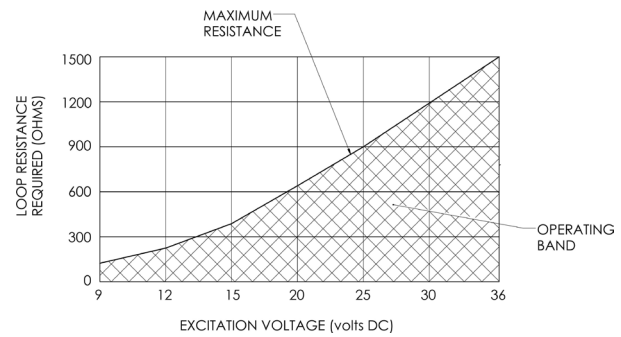
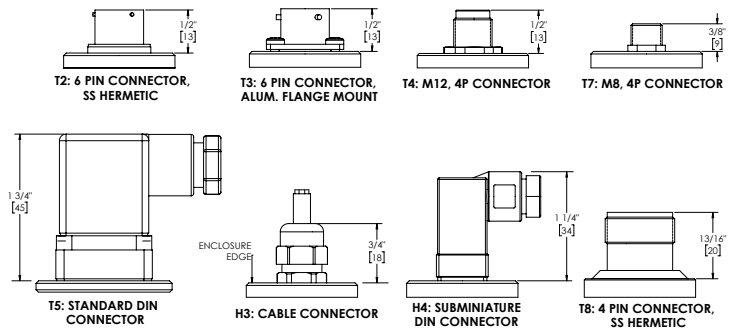
Multi Drop



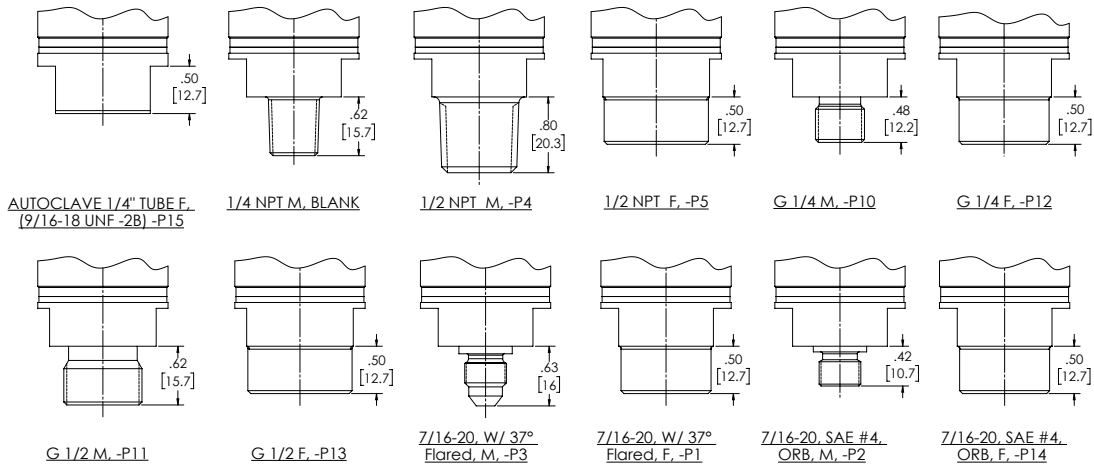
## Technical Drawings



## Standard and Optional Electrical Connections



## Process Connections



CRN  
 DWG #272479



## Product Configurator

Example: H455 T6 -29 BA -P15 -M -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 <sup>7</sup>	0-10,000 psi	0-700 Bar
-29 <sup>3</sup>	0-15,000 psi	0-1,000 Bar
-30 <sup>3</sup>	0-20,000 psi	0-1,400 Bar
-31 <sup>3</sup>	0-22,000 psi	0-1,500 Bar
-32 <sup>3</sup>	0-25,000 psi	0-1,700 Bar
-33 <sup>3</sup>	0-30,000 psi	0-2,000 Bar

### 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 <sup>4</sup>	1/4-18 NPT male (standard)
-P6 <sup>4</sup>	1/4" NPT female
-P4 <sup>4</sup>	1/2" NPT male
-P5 <sup>4</sup>	1/2" NPT female
-P10 <sup>4</sup>	G 1/4, washer seal, male
-P12 <sup>4</sup>	G 1/4, washer seal, female
-P11 <sup>4</sup>	G 1/2, washer seal, male
-P13 <sup>4</sup>	G 1/2, washer seal, female
-P3 <sup>4</sup>	7/16-20, with 37° flared, male
-P1 <sup>4</sup>	7/16-20, with 37° flared, female
-P2 <sup>4</sup>	7/16-20, SAE #4, ORB, male
-P14 <sup>4</sup>	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 <sup>2</sup>	Larger orifice; without pressure surge protector
-SS <sup>4,5</sup>	316L stainless steel wetted material (NACE)
-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 <sup>7</sup>	3 Pin deutsch connector DT04-3P
-D4 <sup>7</sup>	4 Pin deutsch connector DT04-4P
-K	DNV Approval

### Process Connection

Blank	Standard sensor construction
M	Seal-free construction (from 40 bar)

#### Notes

- No agency approvals
- 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.
- Ranges with more than 10k psi are available only with -P15 Process Connection
- Available up to 10,000 psi
- SS option is included in -SC option. -SC does not include material of electrical connection; -UL<sup>6</sup> option and more than 10k psi ranges only with 17-4PH SS wetted material.
- 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
- 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	

\* Vacuum

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