

# Hydrogen Refuel Transducer

## BHyT Series

Data Sheet

### Features

- Advanced sensor signal conditioning ASIC ensures high accuracy up to  $\pm 0.1\%$  and low offset error at zero pressure.
- Offers wide operating temperatures  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$  and water resistant IP67 protection and compatibility with demanding media such as  $\text{H}_2$  and  $\text{O}_2$ .
- Superior EMI-EMC protection as per IEC standards & thermally compensated sensors ensure high accuracy over wide temperature ranges to mitigate thermal errors on sensitive components
- Has the ability to measure pressure ranges from Vacuum to 20,000 psi (1,400 bar)



Exactly What OEMs Want...Without the Wait

### Applications

- Hydrogen Refueling Station
- Hydrogen Storage
- Hydrogen Compressors

### Specifications

Supply (Class II Power Supply)	455X, 455E, 455: 9 TO 30 VDC 452X, 452: 7* TO 30 VDC 452E: 12* TO 30 VDC 454X, 454E, 454: 4.5 TO 5.5 VDC *for special output voltage range consult factory for minimum excitation voltage
Output	H455X, H455, H455E: 4-20 mA (WITH HART OPTION) 455X, 455, 455E: 4 - 20 mA 452X, 452: 1 - 5 VDC 454X, 454, 454E: 0.5 - 4.5 VDC 452E: 1 - 10 VDC
Pressure Range	Up to 20,000 PSI
Operating Temperature	$-40$ to $+176$ F ( $-40$ to $+80^{\circ}\text{C}$ ).
Compensated Temperature Range	$0$ to $+165$ F ( $-18$ to $+74$ C)
Accuracy (BFSL@ $25^{\circ}\text{C}$ )	0.25% FSO AT 75 F. $\pm 0.10\%$ FSO AT 75 F (OPTIONAL).
Proof Pressure	2X RANGE FOR UP TO 7500 PSI MODELS, 1.5X RANGE FOR 7500 - 20000 PSI MODELS.
Zero Offset	1% FSO AT 75 F (24 C).
Span Offset	1% FSO AT 75 F (24 C).
Lifecycle	10M cycles
Long-Term Stability	$\pm 0.2\%$ FSO/year of calibration curve
Response Time	450, H455X: < 70ms 455X & 452X: <50 milliseconds

Shock	50 g's, 11 ms, MIL-STD 202 Method 213, Cond. G
Vibration	10 g's, 10-500 Hz, MIL-STD 202, Method 204, Cond. A
Storage Temperature	$-40$ to $+185$ °F ( $-40$ to $+85$ °C)
Media Temperature	$-40$ to $+212$ °F ( $-40$ to $+100^{\circ}\text{C}$ )
Wetted Materials	316L Stainless Steel
Ingress Protection	FACTORY SEALED NEMA 4X ENCLOSURE ENVIROMENTAL RATING IP66 & IP67.
Reverse Polarity	Yes
Enclosure	NEMA 4X
Approvals: UL	cULus approved as telemetering equipment for use in hazardous locations (UL File E146589, WYMV, WYMV7) factory sealed, Type 4X, as follows: Class I, Div. 1, Groups A, B, C & D Class II, Div. 1, Groups E, F & G
Single Seal	CSA C22.2 No. 61010-1 Certified ANSI/ISA 12.27.01 Certified
ATEX/IECEX	CE 0081 II 2 G D Ex db IIC T5 Gb Ex tb IIIC T81°C Db, IP66 & IP67 $-40^{\circ}\text{C} \leq \text{Tamb} \leq +80^{\circ}\text{C}$ DEMKO 18 ATEX 2084 IECEX UL 18.0090

Specifications Continued

Compliance	RoHS & REACH,UKCA-2503, NACE (WITH -SC, -SS OR -NC OR M OPTIONS),CRN ,CE.
Weight	16 Ounces (453 grams)
Media Restriction	All common industrial and gases and fluids. Refer to wetted materials section or consult factory for special media compatibility
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 t (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
EMI-EMC Compliance:	
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

Wiring Code -

TABLE 1. FREE LEAD WIRES AND CONNECTOR PIN CONNECTIONS

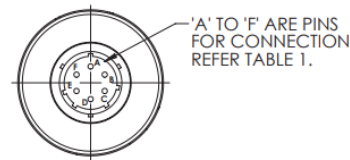
Model No.	Red/A/1	Black/B/2	Green/D/4	White /C/3
H455/H455E	+ Excitation	- Excitation	Earth Ground	Not Included
455/455E	+ Excitation	- Excitation	Earth Ground	Not Included
452/452E	+ Excitation	- Excitation	Earth Ground	Voltage Output
454/454E	+ Excitation	- Excitation	Earth Ground	Voltage Output

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

Model No.	Red/A/1	Black/B/2	Green/D/4	White /C/3
H455/H455E	+ Excitation	-Excitation	Earth Ground	Not Included
455/455E	+ Excitation	-Excitation	Earth Ground	Not Included
452/452E	+ Excitation	-Excitation	Earth Ground	Voltage Output
454/454E	+ Excitation	-Excitation	Earth Ground	Voltage Output

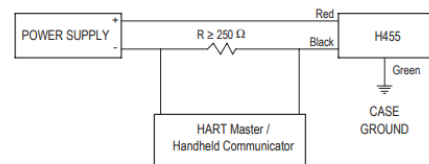
TABLE 3. DEUTSCH CONNECTOR PIN CONNECTIONS

Model	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

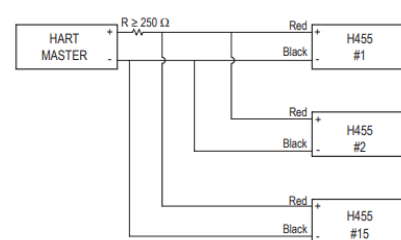


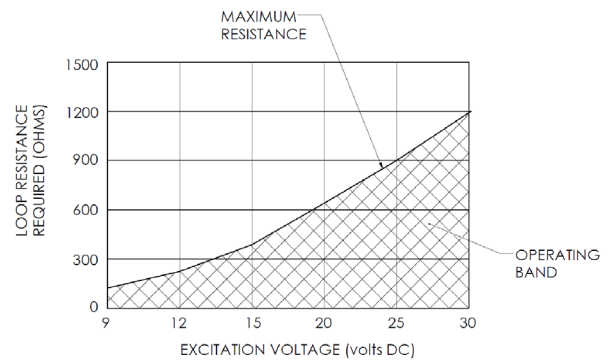
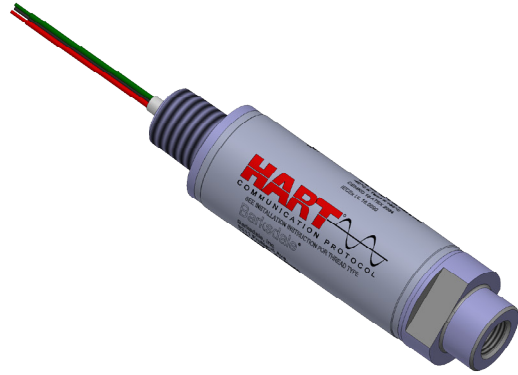
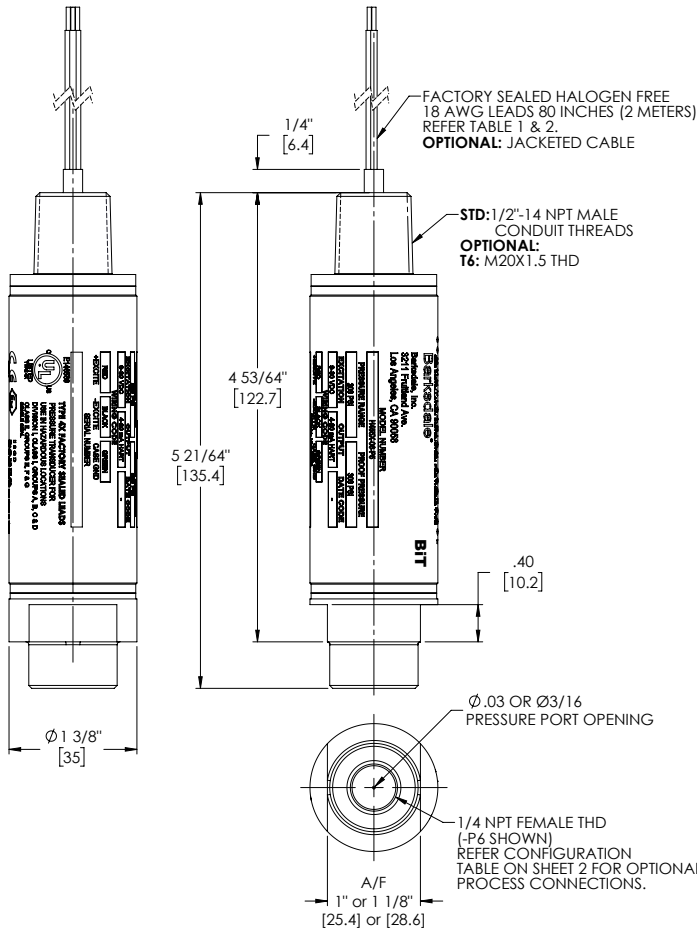
CONFIGURATION WITH HART

Point to Point

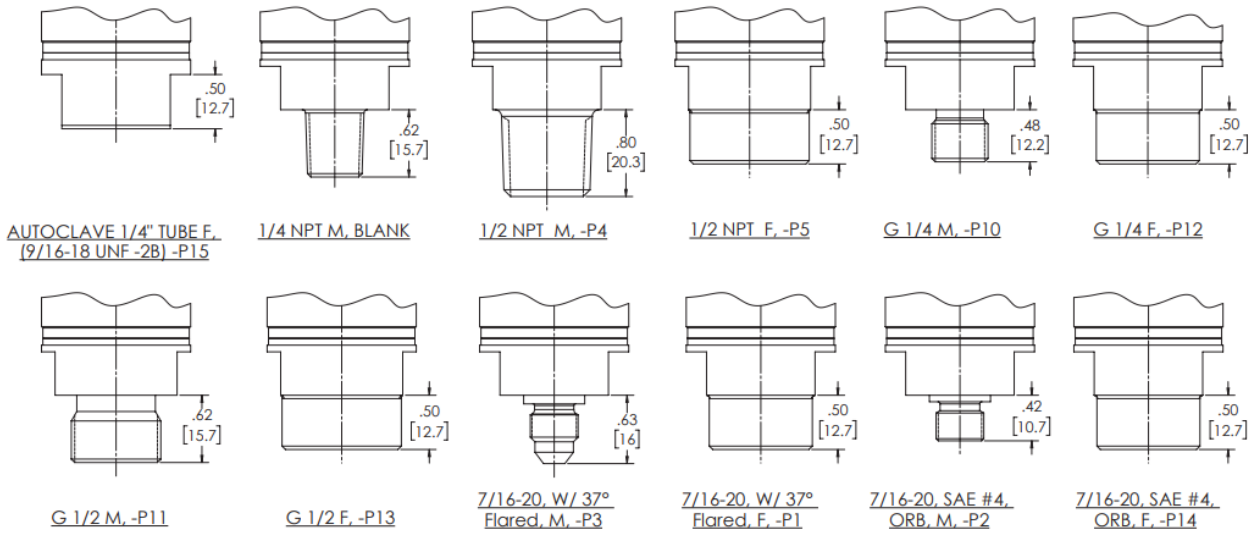


Multi Drop





### Process Connections



# Industrial Transducer

## BHyT Series

### Product Configurator

Example:	H455X	T6	-29	BA	-P15	M	-Z17-A1-Z123
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#### Base Model

H455	4 - 20 mA Output with HART® Comm. Protocol
H455E	4 - 20 mA Output with HART® Comm. Protocol & I.S. Approval
H455X	4 - 20 mA Output with HART® Comm. Protocol & Explosion Proof Approval
455E	4 - 20 mA Output with I.S. Approval
454E	0.5-4.5 V Ratiometric Output, Digital Amplifier with I.S. Approval
452E	1-5 VDC Digital Amplifier with I.S. Approval
455X	4 - 20 mA Output with Explosion Proof Approval
454X	0.5-4.5 V Ratiometric Output, Digital Amplifier & Explosion Proof
452X	1-5 VDC Digital Amplifier with Explosion Proof Approval
455	4 - 20 mA Digital Amplifier
454	0.5-4.5 V Ratiometric Output, Digital Amplifier
452	1-5 VDC Digital Amplifier

#### Electrical Connection

Blank	1/2"-14 NPT Male conduit
T4 <sup>3</sup>	M12 (4 Pin) connector
T5 <sup>3</sup>	Standard DIN (EN 175301-803, Type A)
T6	M20 x 1.5 Male conduit
H4 <sup>3</sup>	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 <sup>5</sup>	0-500 psi	0-40 Bar
-10 <sup>5</sup>	0-1,000 psi	0-70 Bar
-11 <sup>4</sup>	0-1,500 psi	0-100 Bar
-12 <sup>4</sup>	0-2,000 psi	0-150 Bar
-13 <sup>4</sup>	0-3,000 psi	0-200 Bar
-14 <sup>4</sup>	0-4,000 psi	0-300 Bar
-15 <sup>4</sup>	0-5,000 psi	0-350 Bar
-16 <sup>4</sup>	0-6,000 psi	0-400 Bar
-17 <sup>4</sup>	0-7,500 psi	0-500 Bar
-18 <sup>4</sup>	0-10,000 psi	0-700 Bar
-29 <sup>2</sup>	0-15,000 psi	0-1,000 Bar
-30 <sup>2</sup>	0-20,000 psi	0-1,400 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	1/4-18 NPT male (standard)
-P6	1/4" NPT female
-P4	1/2" NPT male
-P5	1/2" NPT female
-P10	G 1/4, washer seal, male
-P12	G 1/4, washer seal, female
-P11	G 1/2, washer seal, male
-P13	G 1/2, washer seal, female
-P3	7/16-20, with 37° flared, male
-P1	7/16-20, with 37° flared, female
-P2	7/16-20, SAE #4, ORB, male
-P14	7/16-20, SAE #4, ORB, female
-P15	HF4 Autoclave, 1/4" tube, female (9/16-18 UNF-2B THD)

#### 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	

#### Options

-ZVxx	Custom voltage output (Available on 452X only). Up to 10VDC. Consult Factory.
-Z17 <sup>1</sup>	Larger orifice; without pressure surge protector
-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)

#### Sensor Construction

Blank <sup>6</sup>	Standard Sensor construction
M	Monolithic Construction

#### Notes

- 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 only in 450 and 450E
- >700 BAR monolithic required.
- Gold plated option available, consult factory.
- Blank option for <40 BAR.