

# Hydrogen ReFuel Transducer

# BHyT Series

## Features

- ▶ Zero Leakage due to seal-free technology
- ▶ Intrinsically safe & explosion proof
- ▶ Advanced sensor signal conditioning ASIC ensures high accuracy up to  $\pm 0.1\%$  and  $\pm 1\%$  zero offset error.
- ▶ Offers wide operating temperatures  $-40\text{ }^{\circ}\text{C}$  to  $+100\text{ }^{\circ}\text{C}$  and water resistant IP67 protection and compatibility with demanding media such as H<sub>2</sub> and O<sub>2</sub>.
- ▶ 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)

## Applications

- ▶ Hydrogen Refueling Station
- ▶ Hydrogen Compressors
- ▶ Hydrogen Storage



## General Specifications

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
Output:	455X, 455E, 455: 4 - 20 mA 452X, 452: 1 - 5 VDC 452E: 1 - 10 VDC 454X, 454E, 454: 0.5 - 4.5 VDC
Pressure Range:	Up to 20,000 PSI
Operating Temperature:	$-40$ to $+176\text{ }^{\circ}\text{F}$ ( $-40$ to $+80\text{ }^{\circ}\text{C}$ )
Compensated Temperature Range:	$0$ to $+165\text{ }^{\circ}\text{F}$ ( $-18$ to $+74\text{ }^{\circ}\text{C}$ )
Accuracy (BFSL@25°C)	$\pm 0.25\%$ FSO @ $75\text{ }^{\circ}\text{F}$ $\pm 0.10\%$ FSO @ $75\text{ }^{\circ}\text{F}$ (Option A1)
Proof Pressure	2x range for up to 7500 psi models, 1.5X range for 7500 - 20000 psi models
Zero Offset	$\pm 1\%$ FSO @ $75\text{ }^{\circ}\text{F}$ ( $24\text{ }^{\circ}\text{C}$ )
Span Offset	$\pm 1\%$ FSO @ $75\text{ }^{\circ}\text{F}$ ( $24\text{ }^{\circ}\text{C}$ )
Lifecycle	10M cycles
Long-Term Stability	$\pm 0.2\%$ FSO/year of calibration curve
Response Time	455X & 452X: <50 milliseconds 455E & 452E: <50 milliseconds 455 & 452: <50 milliseconds

## Environmental Specifications

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 $+185\text{ }^{\circ}\text{F}$ ( $-40$ to $+85\text{ }^{\circ}\text{C}$ )
Media Temperature	$-40$ to $+212\text{ }^{\circ}\text{F}$ ( $-40$ to $+100\text{ }^{\circ}\text{C}$ )
Wetted Materials	316L Stainless Steel
Ingress Protection	Factory sealed NEMA 4X enclosure enviromental rating IP66 & IP67
Reverse Polarity	Yes
Enclosure	NEMA 4X
Approvals	UL 61010-1 with class II power source
Compliance	REACH, RoHS, CE
Weight	15.87oz (450g) Approximately (Consult factory for exact weights)

## Specifications Continued

Compliance	RoHS & REACH, UKCA-2503, NACE (WITH -SC, -SS OR -NC OR M OPTIONS), CRN, CE
Media Compatibility	All common industrial gases and fluids Compatible with hydrogen media

## 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:	455 & 452: EFT (Burst) Test, +/-1 kV
IEC/EN 61000-4-5:	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

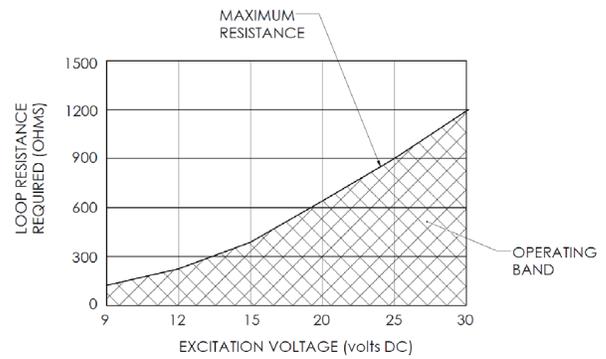
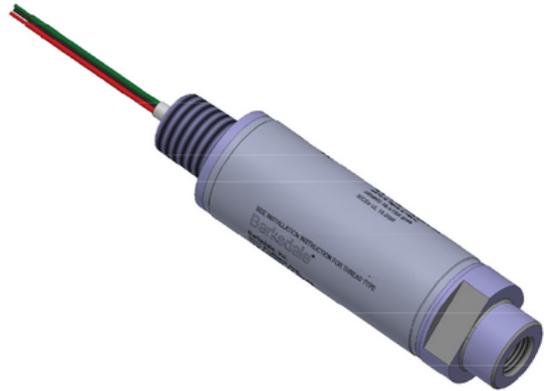
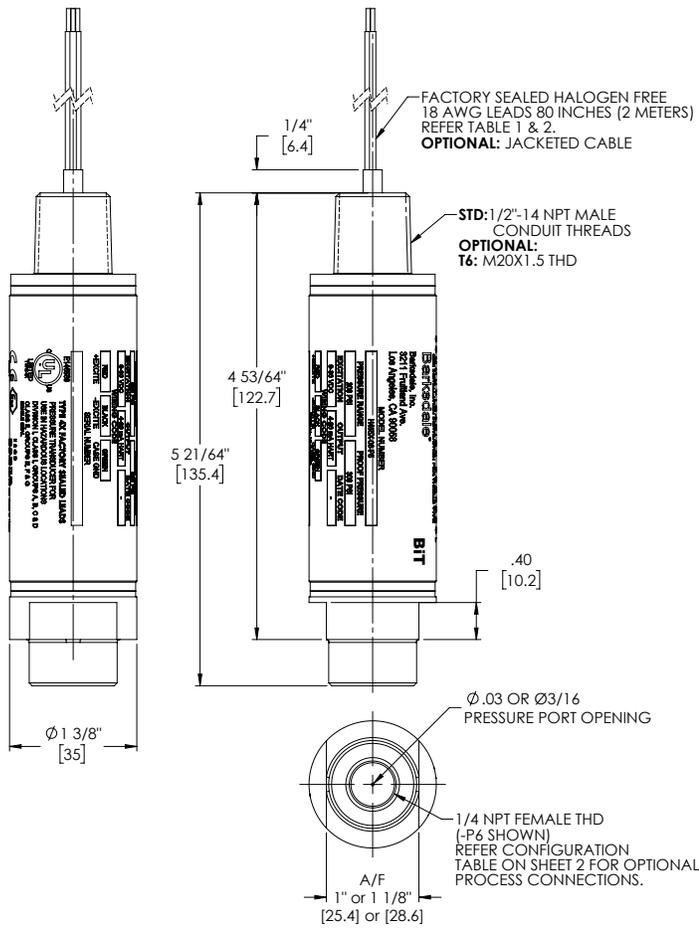
## Wiring Code

TABLE 1. FREE LEAD WIRES AND CONNECTOR PIN CONNECTIONS				
Model No.	Red/A/1	Black/B/2	Green/D/4	White /C/3
455/455E	+ Excitation	- Excitation	Earth Ground	Not Included
452/452E	+ Excitation	- Excitation	Earth Ground	Voltage Output
454/454E	+ Excitation	- Excitation	Earth Ground	Voltage Output

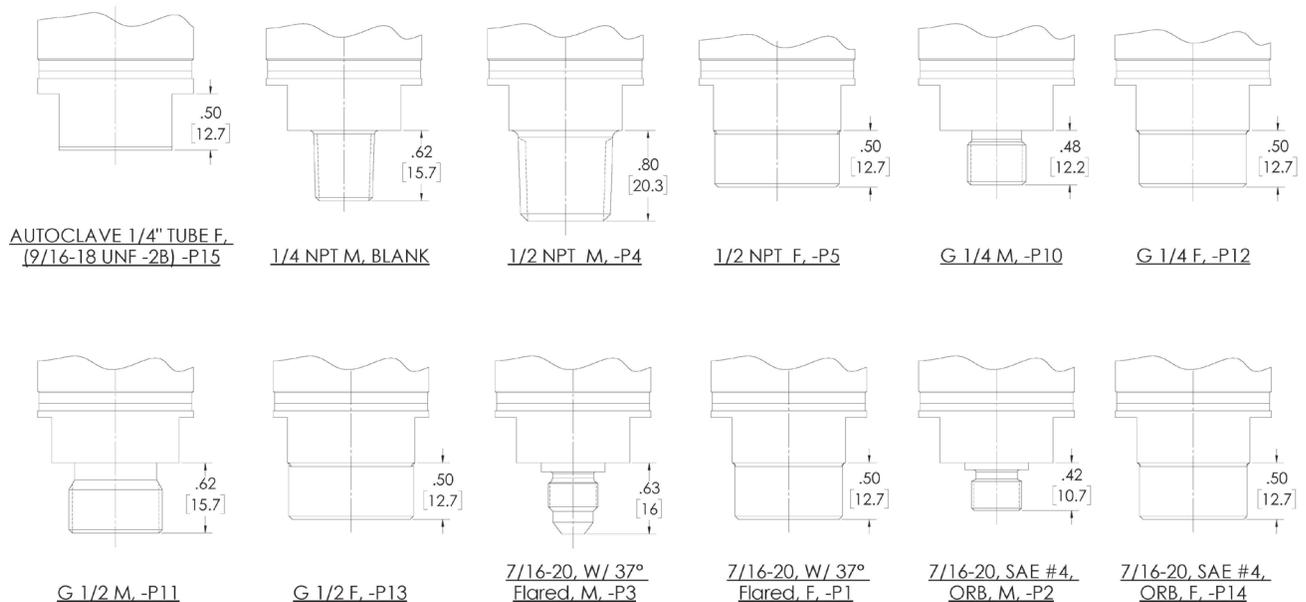
TABLE 2. JACKETED CABLE WIRE CONNECTIONS (-J OPTION)				
Model No.	Red/A/1	Black/B/2	Green/D/4	White /C/3
455/455E	+ Excitation	- Excitation	Earth Ground	Not Included
452/452E	+ Excitation	- Excitation	Earth Ground	Voltage Output
454/454E	+ Excitation	- Excitation	Earth Ground	Voltage Output

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

## Technical Drawing



## Process Connections



# Hydrogen ReFuel Transducer

# BHyT Series

## Product Configurator

Example:	455X	T6	-29	BA	-P15	M	-Z17-A1-Z123
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### Base Model

455E	4 - 20 mA Output with I.S. Approval
454E	0.5-4.5 V Ratiometric Output, Digital Amplifier with I.S. Approval
452E	1-10 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 <sup>6</sup>	0-15 psi	0-1 Bar
-21 <sup>6</sup>	0-30 psi	0-2 Bar
-03 <sup>6</sup>	0-50 psi	0-3 Bar
-22 <sup>6</sup>	0-60 psi	0-4 Bar
-04 <sup>6</sup>	0-100 psi	0-7 Bar
-05 <sup>6</sup>	0-150 psi	0-10 Bar
-06 <sup>6</sup>	0-200 psi	0-15 Bar
-07 <sup>6</sup>	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	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	0-10,000 psi	0-700 Bar
-29 <sup>2,4</sup>	0-15,000 psi	0-1,000 Bar
-30 <sup>2,4</sup>	0-20,000 psi	0-1,400 Bar

### Pressure Unit and 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)

### 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 Construc-

Blank <sup>6</sup>	Standard Sensor construction
M	Seal-free Construction (from 40 bar)

### 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)

### 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
- 29, -30 available with monolithic sensor only.
- Gold plated option available, consult factory.
- Blank option for 40 BAR and below pressure range.
- Deutsch 3-pin and 4-pin electrical connections available. Consult factory for availability

### Additional Documents and Accessories

Title	Reference Number
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	