

Hydrogen Pressure Transducer

BHyT – BiT Series

Features

- ▶ Zero Leakage due to seal-free technology
- ▶ Intrinsically safe & Explosion proof
- ▶ Offers wide operating temperatures -40 °C to +100 °C and water resistant IP67 protection and compatibility with demanding media such as H₂ and O₂.
- ▶ 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 1400 bar (20,000 psi)
- ▶ DNV approved

Applications

- ▶ Hydrogen Refueling Station
- ▶ Hydrogen Storage
- ▶ Hydrogen Compressors
- ▶ High Pressure Applications



Technical Data

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
Output	455X, 455, 455E: 4-20 mA 452X, 452: 1 - 5 VDC 454X, 454, 454E: 0,5 - 4,5 VDC 452E: 1 - 10 VDC for special output voltage range consult factory
Pressure Range	Up to 1400 bar (20.000 psi)
Operating Temperature	-40 °C ... +80 °C (-40 °F ... + 176 °F)
Compensated Temperature Range	-18 °C ... +74 °C (0 °F ... + 165 °F)
Accuracy (BFSL@25°C)	±0,25% FSO at 75 °F ±0,10% FSO at 75 °F (Option A1)
Proof Pressure	2X range for up to 500 bar (7500 psi) models, 1,5X range for 500 - 1400 bar (7500 - 20000 psi) models
Zero Offset	±1% FSO at 24 °C (75 °F)
Span Offset	±1% FSO at 24 °C (75 °F)
Lifecycle	10M cycles
Long-Term Stability	±0.2% FSO/year (of calibration curve)
Response Time	455X & 452X: <50 milliseconds 455E & 452E: <50 milliseconds 455 & 452: <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 °C ... +85 °C (-40 °F ... + 185 °F)
Media Temperature	-40 °C ... +100 °C (-40 °F ... + 212 °F)
Wetted Materials	316L Stainless Steel
Ingress Protection	Factory sealed NEMA 4X enclosure environmental rating IP66 & IP67
Enclosure	NEMA 4X
Reverse Polarity	Yes
Approvals:	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 DNV
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 °C ≤ Tamb ≤ +80 °C DEMKO 18 ATEX 2084 IECEX UL 18.0090

Hydrogen Refuel Transducer

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Technical Data Continued

Compliance	RoHS & REACH, UKCA-2503, NACE (WITH -SC, -SS OR -NC OR M OPTIONS), CRN, CE.
Weight	453 gr (16 Ounces)
Media Compatibility	All common industrial and 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	N/A
452/452E	+ Excitation	-Excitation	Earth Ground	Voltage Output
454/454E	+ Excitation	-Excitation	Earth Ground	Voltage Output

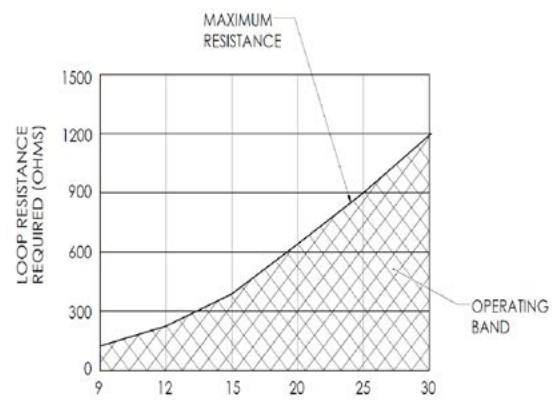
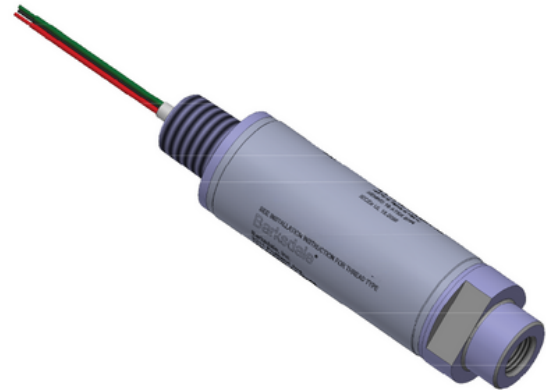
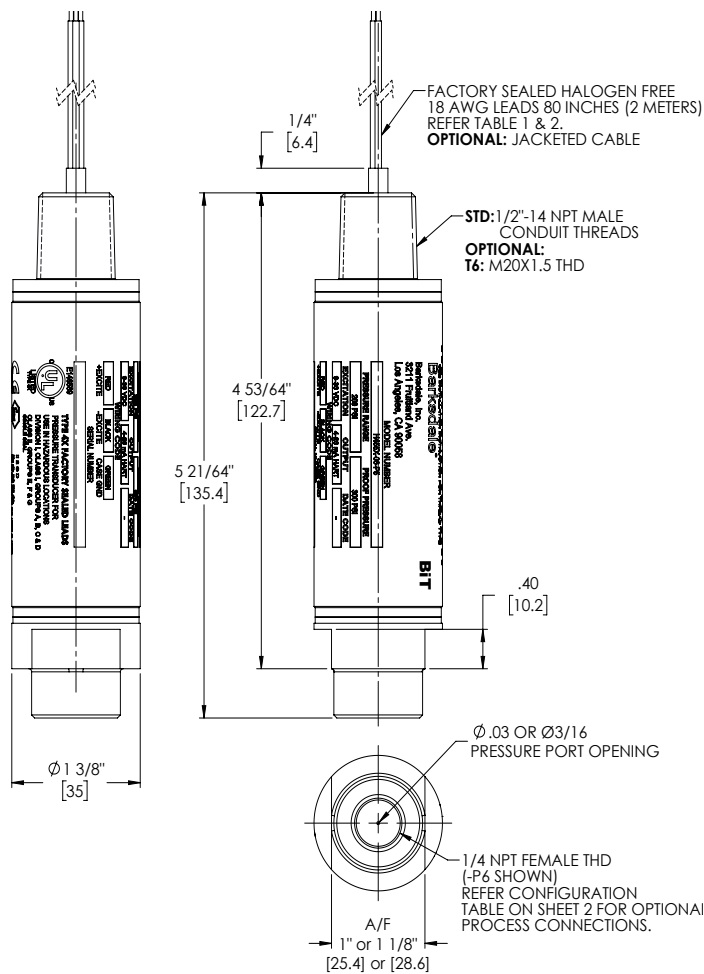
TABLE 2. JACKETED CABLE WIRE CONNECTIONS (-J OPTION)				
Model No.	Red/A/1	Black/B/2	Green/D/4	White /C/3
455/455E	+ Excitation	-Excitation	Earth Ground	N/A
452/452E	+ Excitation	-Excitation	Earth Ground	Voltage Output
454/454E	+ Excitation	-Excitation	Earth Ground	Voltage Output

TABLE 3. DEUTSCH CONNECTOR PIN CONNECTIONS ⁷					
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

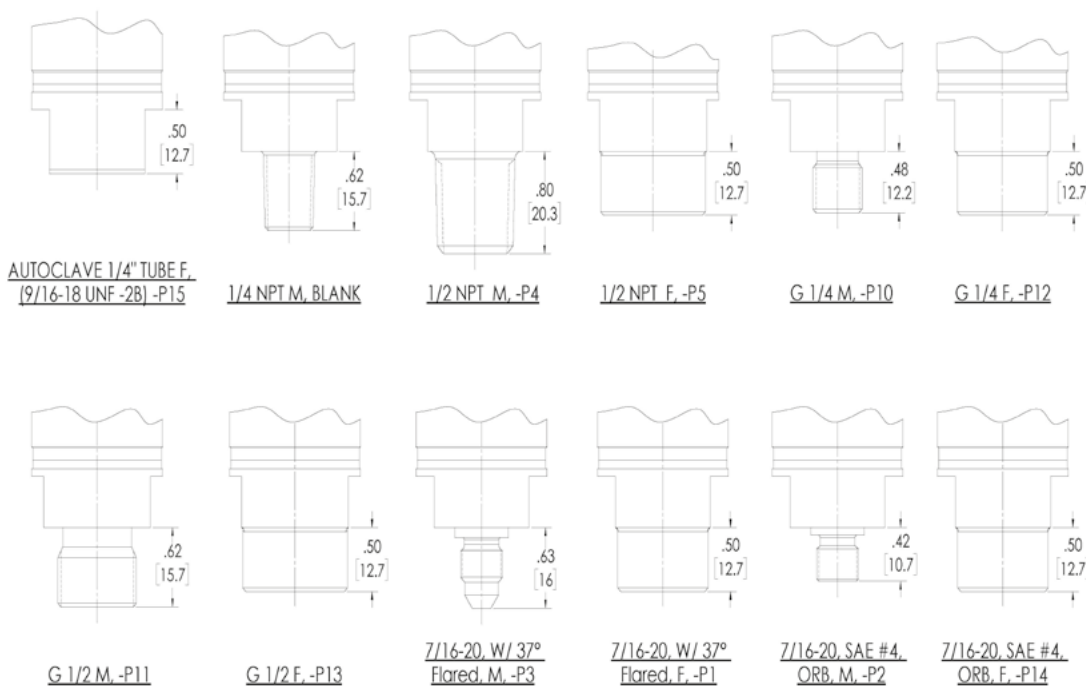
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BhyT Series

Dimensions (mm)



Process Connections



Order Code

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 ³	M12 (4 Pin) connector
-T5 ³	Standard DIN (EN 175301-803, Type A)
-T6	M20 x 1.5 Male conduit
-H4 ³	Mini DIN (EN 175301-803, Type C)

Pressure Range	psi	bar
-23*	0-29,9" of Hg	0 to -1
-01 ⁶	0-15	0-1
-21 ⁶	0-30	0-2
-03 ⁶	0-50	0-3
-22 ⁶	0-60	0-4
-04 ⁶	0-100	0-7
-05 ⁶	0-150	0-10
-06 ⁶	0-200	0-15
-07 ⁶	0-300	0-20
-08 ⁵	0-500	0-40
-10 ⁵	0-1000	0-70
-11	0-1500	0-100
-12	0-2000	0-150
-13	0-3000	0-200
-14	0-4000	0-300
-15	0-5000	0-350
-16	0-6000	0-400
-17	0-7500	0-500
-18	0-10000	0-700
-29 ^{2,4}	0-15000	0-1000
-30 ^{2,4}	0-20000	0-1400

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)

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	G1/4, washer seal, male
-P12	G1/4, 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)

Sensor Construction	
Blank ⁶	Standard Sensor construction
M	Monolithic Construction

Options	
-ZVxx	Custom voltage output (Available on 452X only). Up to 10VDC. Consult Factory.
Z17 ¹	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)
-K	DNV approval

Example

455X -T6 -29 BA -P15 M

¹) Vacuum

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 only in 450 and 450E

⁵) -29, -30 available with monolithic sensor only.

⁶) Gold plated option available, consult factory.

⁷) Blank option for ≤40 bar

⁸) Deutsch 3-pin and 4-pin electrical connections available. Consult factory.