



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA00003J1
Revision No:
1

This is to certify:
that the Pressure Transmitter

with type designation(s)
BiT series

issued to
Barksdale, Inc.
Los Angeles, CA, USA

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

| | |
|--------------------|----------|
| Temperature | D |
| Humidity | B |
| Vibration | B |
| EMC | A |
| Enclosure | B |

Issued at **Hamburg** on **2026-02-20**

This Certificate is valid until **2029-12-05**.

for **DNV**

DNV local unit: **Long Beach**

Approval Engineer: **Jens Dietrich**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

The pressure transmitters use the following type key for the variants.
 Limitation is to 18 letters, if the order code exceeds 18 letters, "-" will be removed
 Order code example: H455ET6-29BA-P4M-K | H455ET629BAMZ17SSK

| | |
|------------------------|--|
| Base Model | |
| H455E | 4 - 20 mA Output |
| 455E | 4 - 20 mA Output |
| 452E | 1-10 Voltage Output |
| 454E | 0.5-4.5 Voltage; Ratiometric 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 | 0-10,000 psi 0 – 700 Bar |
| -29 | 0-15,000 psi 0 – 1000 Bar |
| -30 | 0-20,000 psi 0 – 1400 Bar |
| -31 | 0-22,000 psi 0 – 1500 Bar |
| -32 | 0-25,000 psi 0 – 1700 Bar |
| -33 | 0-30,000 psi 0 – 2000 Bar |
| Pressure Unit and 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 | 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) |
| Process Connection - Sensor | |
| Blank | Standard sensor construction |
| M | Seal-free construction (from 40 bar) |
| Options | |
| -ZVxx | Custom voltage output (Available on 452E only). Up to 10VDC. |
| -Z17 | For high pressure models with larger orifice; without pressure surge protector |
| -SS | 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 | 3 Pin Deutsch connector DT04-3P |
| -D4 | 4 Pin Deutsch connector DT04-4P |
| -K | DNV approved pressure transducer |

Limitation is to 18 letters, if the order code exceeds 18 letters, "-" will be removed
 Order code example: H455T6-29BA-P15M-K | H455T629BAMKZ17SS

| | |
|-----------------------|--|
| Base Model | |
| H455 | 4 - 20 mA Output |
| 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 | 0-10,000 psi 0 – 700 Bar |
| -29 | 0-15,000 psi 0 – 1000 Bar |
| -30 | 0-20,000 psi 0 – 1400 Bar |
| -31 | 0-22,000 psi 0 – 1500 Bar |
| -32 | 0-25,000 psi 0 – 1700 Bar |
| -33 | 0-30,000 psi 0 – 2000 Bar |
| Pressure Unit and 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 | 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) |
| Process Connection - Sensor | |
| Blank | Standard sensor construction |
| M | Seal-free construction (from 40 bar) |
| Options | |
| -ZVxx | Custom voltage output (Available on 452 only). Up to 10VDC. |
| -Z17 | For high pressure models with larger orifice; without pressure surge protector |
| -SS | 316L stainless steel wetted material (NACE) |
| -A1 | Accuracy BFUL 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 | 3 Pin Deutsch connector DT04-3P |
| -D4 | 4 Pin Deutsch connector DT04-4P |
| -K | DNV approved pressure transducer |

Limitation is to 18 letters, if the order code exceeds 18 letters, "- will be removed
 Order code example: H455X-29BA-P15M-K | H455XT629BAMZ17SSK

| | |
|-----------------------|-----------------------------|
| Base Model | |
| H455X | 4 - 20 mA Output |
| 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 |
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| -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 |

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| -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 | 0-15,000 psi 0 – 1000 Bar |
| -30 | 0-20,000 psi 0 – 1400 Bar |
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| Pressure Unit and Type | |
| Blank | PSI - Gauge pressure (standard) |
| A | PSI - Absolute pressure (Not applicable with “-23” range) |
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| 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) |
| | |
| Process Connection - Sensor | |
| Blank | Standard sensor construction |
| M | Seal-free construction (from 40 bar) |
| | |
| Options | |
| -ZVxx | Custom voltage output (Available on 452X only). Up to 10VDC. |
| -Z17 | For high pressure models with larger orifice; without pressure surge protector |
| -SS | 316L stainless steel wetted material (NACE) |
| -A1 | Accuracy BFSL 0.1% FSO (LHR) at 75°F (Consult factory on vacuum [-23] models) |
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| -D3 | 3 Pin Deutsch connector DT04-3P |
| -D4 | 4 Pin Deutsch connector DT04-4P |
| -K | DNV approved pressure transducer |

Approval conditions

The Type Approval covers hardware listed under Product description based on DNV Pt.4 Ch.9 Sec.5. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Product certificate

If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. After certification the clause for software control will be put into force.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Application/Limitation

Verification of intrinsic safety (Ex-protection) is not covered by this certificate and needs to be proven by a certificate from a notified body as required for the respective application.

Tests carried out

Applicable tests according to DNV CG-0339, August 2021.

Marking of product

Manufacturer name, model number, pressure range, proof pressure, electrical ratings, date code.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

Ensure that type approved documentation is available

Inspection of factory samples, selected at random from the production line (where practicable)

Review of production and inspection routines, including test records from product sample tests and control routines

Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications

Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given

Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE