

SMART HART OIL FILLED MELT PRESSURE TRANSMITTERS FOR APPLICATIONS IN POTENTIALLY EXPLOSIVE ATMOSPHERES HWX SERIES - CURRENT OUTPUT AND PERFORMANCE LEVEL 'c'

4...20mA Output



MAIN FEATURES

- Pressure ranges from: 0-17 to 0-1000 bar / 0-250 to 0-15000 psi
- Accuracy: < ±0.25% FSO (H); < ±0.5% FSO (M)
- · Fluid-filled system for temperature stability
- · Oil filling volume: HWX0 (30mm³); HWX1, HWX2, HWX3 (40mm³)
- 1/2-20UNF, M18x1.5 standard threads; other types available on request
- · Autozero function on board / external option
- 17-7 PH corrugated diaphragm with GTP+ coating
- HWX0 The rigid rod configuration provides fast and easy installation.
- HWX1 The flexible rod configuration is suitable for applications demanding greater thermal isolation and where installation would otherwise be difficult.
- HWX2 This configuration lets you measure process pressure and temperature at the same point with a single installation.
- HWX3 The configuration with exposed tip is ideal for applications in limited space.

Main intrinsic safety characteristics

Transmitter designed and produced in compliance with Directive 2014/34/EU ATEX and according to European standards. Protection mode: group II, category 1G, 1D

GAS protection mode: Ex ia IIC T6, T5, T4 Ga (Ambient Temp.:

-20°C...+60°C / +75°C / +85°C)

DUST protection mode: Ex ia IIIC T85°C, T100°C, T135°C Da IP65 (Ambient Temp.: -20°C...+60°C / +75°C / +85°C)

| 30 V |
|--|
| 100 mA |
| 0,75 W |
| 17 μH |
| 10 nF |
| v of a cable: n) with maximum length 15m. |
| |

The HWX series of Gefran are pressure transmitters with HART communication protocol for using in high temperature environment with explosive atmosphere presence.

The main characteristic of this series is the capability to read temperature of the media up to 315°C.

The constructive principle is based on the hydraulic trasmission of the pressure.

The fluid-filled system assures the temperature stability. The physical measure is transformed in a electrical measure by means of strain-gauge technology.

TECHNICAL SPECIFICATIONS

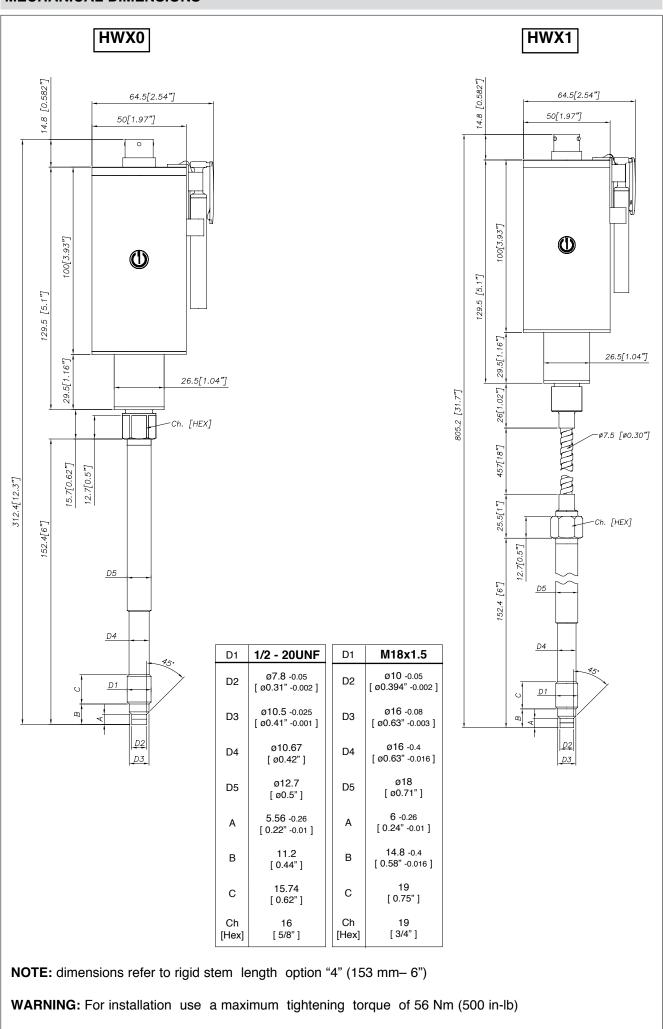
| Accuracy (1) | H <±0.25%FSO (1001000 bar) M <±0.5%FSO (171000 bar) |
|---|---|
| Resolution | 16 bit |
| Measurement range | 017 to 01000bar 0250 to 015000psi |
| Rangeability | 3:1 |
| Maximum overpressure (without degrading performances) | 2 x FS 1.5 x FS above 500bar/7500psi |
| Measurement principle | Extensimetric |
| Power supply | 1330Vdc |
| Maximum current absorption | 23mA |
| Output signal Full Scale (FSO) | 20mA |
| Zero balance (tollerance ± 0.25% FSO) | 4mA |
| Calibration signal | 80% FSO |
| Power supply polarity reverse protection | YES |
| Compensated temperature range housing | 0+85°C |
| Operating temperature range housing | -30+85°C |
| Storage temperature range housing | -40+125°C |
| Thermal drift in compensated range: Zero / Calibration / Sensibility | < 0.02% FSO/°C |
| Diaphragm maximum temperature | 315°C / 600°F |
| Zero drift due to change in process temperature (zero) | < 0.04 bar/°C |
| Standard material in contact with process medium | Diaphragm: • 17-7 PH corrugated diaphragm with GTP+ coating Stem: • 17-4 PH |
| Thermocouple (model HWX2) | STD: type "J" (isolated junction) |
| Protection degree (with 6-pole female connector) | IP65 |
| FSO = Full scale output (1) BFSL method (Best Fit Straight Line): in Hysteresis and Repeatability | cludes combined effects of Non-Linearity, |

The Melt pressure transmitters must be connected to other equipment (galvanic isolation barriers) with individual ATEX certification such as [Ex ia Ga] IIC. The thermocouple circuit must be powered by means of galvanic isolation barriers with a maximum of 30V.

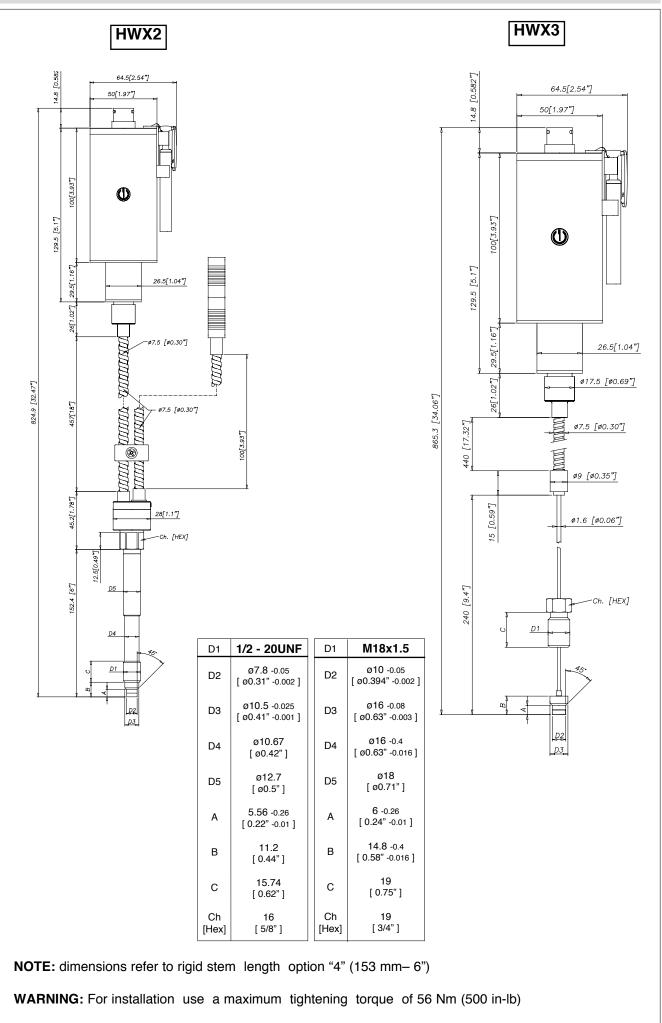


EC-Type Examination Certificate number: DNV 13 ATEX 3894

MECHANICAL DIMENSIONS



MECHANICAL DIMENSIONS



SELF DIAGNOSTICS (ONLY FOR PL'C' VERSIONS)

Below the conditions detected by the sensor self-diagnostics:

- \cdot Cut cable / device non connected / broken power supply, output \leq 3.6mA
- \cdot Pin detachment output \leq 3.6mA
- · Broken primary element ≥21mA
- · Pressure above 200% of the span, output \geq 21mA
- \cdot Voltage monitor in case of overvoltage/undervoltage/voltage variation in the electronics, output \leq 3.6mA (*)
- · Program sequence error, output \leq 3.6mA (*)
- · Overtemperature on the electronics, output \leq 3.6mA (*)
- · Error on the primary element output or on the first amplification stage, output ≥ 21 mA

(*) In such conditions the Alarm Type can be programmed via HART at ≥ 21 mA.

NAMUR COMPLIANCE (ONLY FOR PL'C' VERSIONS)

The sensors are tested according to Namur NE21 recommendations. The same compatibility is valid for the NE43 Namur recommendation with the following sensor behaviour in case of breakdown:

- \cdot Cut cable: breakdown information as the signal is \leq 3.6mA
- \cdot Device not connected: breakdown information as the signal is \leq 3.6mA
- · Broken power-supply: breakdown information as the signal is \leq 3.6mA
- or in case of performance problems:
- · Broken primary element $\ge 21 \text{mA}$
- · Pressure above 200% of the span, output ≥21mA
- \cdot Others \leq 3.6mA(*)

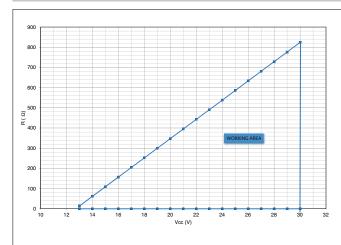
(*) In such a condition the Alarm Type can be programmed via HART at ≥ 21 mA. Note: in all the remaining situations, the output signal is always included between 3.8 and 20.5mA.



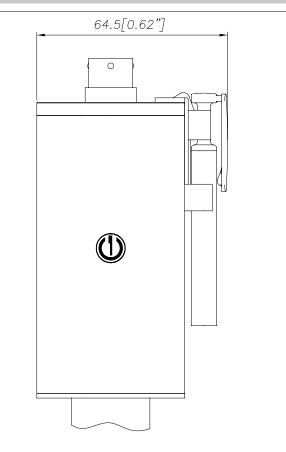
Recommendation: the error level set by the customer (e.g. maximum pressure value) has to be inside the nominal range.

LOAD DIAGRAM

AUTOZERO FUNCTION



The diagram shows the optimum ratio between load and power supply for transmitters with 4...20mA output. For correct function, use a combination of load resistance and voltage that falls within the two lines in the graph above.

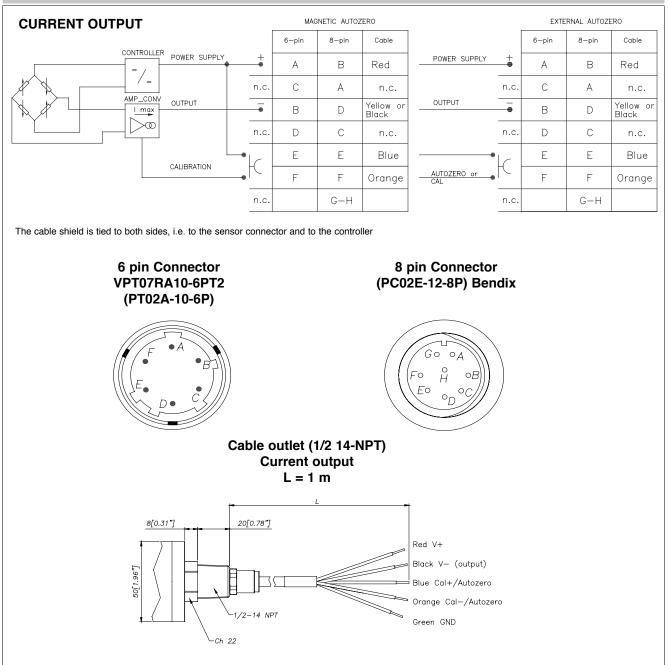


The Autozero function is activated through a magnetic contact (external magnet supplied with the sensor).

The Autozero function can be activated through HART command as well.

See the manual for a complete Autozero function explanation.

ELECTRICAL CONNECTIONS



ACCESSORIES

| Connectors 6-pin female connector (IP65 protection degree) 8-pin female connector | CON300 CON307 | Cable color code | | |
|--|------------------|---------------------|--------|--|
| Accessories | | Conn. | Wire | |
| Mounting bracket | SF18 | A-2 | Red | |
| Dummy plug for 1/2-20UNF | SC12 | B-4 | Black | |
| Dummy plug for M18x1.5 | SC18 | C-1 | White | |
| Drill kit for 1/2-20UNF Drill kit for M18x1.5 | KF12 KF18 | | | |
| Cleaning kit for 1/2-20UNF | CT12 | D-6 | Green | |
| Cleaning kit for M18x1.5 | CT18 | E-7 | Blue | |
| Fixing pen clip | PKIT1032 | F-3 | Orange | |
| Autozero pen | PKIT378 | 5 | Grey | |
| Extension cables | | 8 | Pink | |
| 6-pin connector with 3mt Atex cable | PCAV221 | | I | |
| 6-pin connector with 4mt Atex cable | PCAV104 | | | |
| 6-pin connector with 5mt Atex cable | PCAV105 | | | |
| 6-pin connector with 10mt Atex cable | PCAV106 | | | |
| Thermocouples for model HWX2 | | | | |
| Type "J" (for rigid rod 153mm - 6") | TTER 601 | | | |

ORDER CODE

| | | | HW | | └─ ⁻ └- ┼──┼ | J-L | | | | L | | 0000 X (| | 0 |
|--|--|---|---|---|----------------------------|-----|--|--|------|---|--|--|---|------|
| | | | | | | | | | | | | 000= Special | executions | |
| | OUTPUT | SIGNAL | | | | | | | | | | | · • • • | |
| | 420mA | X | | | | | | | | | 4 -20°C. | x ia IIC T- +85°C)/Exia I | 4 Ga (1am IIC T135°C Da | IP65 |
| | | | | | | | | | | | | x ia IIC T | | |
| | v | ERSION | | | | | | | | - | -20°C. | +75°C)/Ex ia I | | |
| | Rigid rod | 0 | | | | | | | | | | x ia IIC T(+60°C)/Ex ia I | | |
| Rigid + fl | flexible rod | 1 | | | | | | | | L | 1 | | | |
| With ther | rmocouple | 2 | | | | | | | | Γ | E | External Auto | ozero (*) | |
| Expose | ed capillary | 3 | | | | | | | I | | 0 | Magnetic Au | tozero | |
| | | | | | | | | | | | (*) as an alte | ernative to the CA | L function | |
| | CON | ECTOR | | | | | | | | | | | | |
| | 6 pin | 6 | | | | | | | | | Р | Performance | Level='c' | |
| | 8 pin | 8 | | | | | | | | | 0 | Standard 42 | 20mA | |
| | NPT Cable | N | | | | | | | | Г | | E ROD LENG | TH(mm/inch/ |)/* |
| | 1 | | | | | | | | | | Standard | | | 55)(|
| | | ACCL | JRACY | CLAS | s — | | | | | F | 0 | none | | |
| 5% EQO |) (ranges > 1(| 00 bar/150 | 0 psi) | н | - | | | | | ┢ | | (HWX1, HWX | 2) | |
| J70 FJU | | | | | | | | | | | | | -, | |
| J70 F3U | | | FSO | М | | | | | | | D | 457mm | 18" | |
| J % FOU | | | | М | | | | | | | D | 457mm 610mm | 18" 24" | |
| J % F3U | | | | Μ | | | | | | | | 457mm 610mm 760mm | 18" 24" 30" | |
| 370 F3U | | | FSO | | | | | | | | Е | 610mm 760mm | 24" | |
| | | 0.5% | FSO | | | | | | | | E F | 610mm 760mm | 24" | |
| | N | 0.5% | MENT I | | | | | | | | E F Standard L | 610mm 760mm (HWX3) | 24" 30" | |
| b 17 35 | N Dar B17U B35U | 0.5% | MENT I | RANGI P25D P05C | | | | | | | E F Standard L | 610mm 760mm (HWX3) 711mm | 24" 30" | |
| b 17 35 50 | N Dar B17U B35U B05D | 0.5% | MENT I psi | RANGI P25D P05C P75D | | | | | | | E F Standard L Available | 610mm 760mm (HWX3) 711mm on request | 24" 30" 28" | |
| b 17 35 50 70 | N Dar B17U B35U | 0.5% | MENT I psi | RANGI P25D P05C | | | | | | | E F Standard L Available | 610mm 760mm (HWX3) 711mm on request 76mm | 24" 30" 28" 3" | |
| b 17 35 50 70 100 | M Dar B17U B35U B05D B07D B01C | 0.5% | MENT I psi | P25D P05C P75D P01M P15C | | | | | | | E F Standard L Available A B | 610mm 760mm (HWX3) 711mm on request 76mm 152mm | 24" 30" 28" 3" 6" | |
| b 17 35 50 70 100 200 | M Dar B17U B35U B05D B07D B01C B02C | 0.5% | MENT I psi | P25D P05C P75D P01M P15C P03M | | | | | | | E F Standard L Available A B C | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm | 24" 30" 28" 3" 6" 12" | |
| b 17 35 50 70 100 200 350 | N Dar B17U B35U B05D B07D B01C B02C B35D | 0.5% EASURE 250 500 750 1000 1500 3000 5000 | MENT I psi | P25D P05C P75D P01M P15C P03M P05M | | | | | | | E F Standard L Available o A B C RIGID RO | 610mm 760mm (HWX3) 711mm on request 76mm 152mm | 24" 30" 28" 3" 6" 12" mm/inches) | (* |
| b 17 35 50 70 100 200 350 500 | Nar B17U B35U B05D B07D B01C B02C B35D B35D B05C | 0.5% | MENT I psi | P25D P05C P75D P01M P15C P03M P05M P75C | | | | | | | E F Standard L Available o A B C RIGID RO | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm | 24" 30" 28" 3" 6" 12" mm/inches) | (* |
| b 17 35 50 70 100 200 350 500 700 | M Dar B17U B35U B05D B07D B01C B02C B35D B05C B05C B07C | 0.5% | MENT I psi | P25D P05C P75D P01M P15C P03M P05M P75C P10M | | | | | | | E F Standard L Available A B C RIGID RO Standard | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH (((HWX0, HWX1) | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) | (* |
| b 17 35 50 70 100 200 350 500 700 | Nar B17U B35U B05D B07D B01C B02C B35D B35D B05C | 0.5% | MENT I psi | P25D P05C P75D P01M P15C P03M P05M P75C | | | | | | | E F Standard L Available A B C C RIGID RO Standard 4 5 | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH (1 (HWX0, HWX1) 153mm | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) 6" | (* |
| b 17 35 50 70 100 200 350 500 700 | M Dar B17U B35U B05D B07D B01C B02C B35D B05C B05C B07C | 0.5% | MENT I psi I I I I I I I I I I I I I I I I I I I | P25D P05C P75D P01M P15C P03M P05M P75C P10M P15M | | | | | | | E F Standard L Available A B C C RIGID RO Standard 4 5 | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH (in (HWX0, HWX1) 153mm 318mm | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) 6" | (* |
| b 17 35 50 70 100 200 350 500 700 | M Dar B17U B35U B05D B07D B01C B02C B35D B05C B05C B07C | 0.5% | MENT I psi I I I I I I I I I | P25D P05C P75D P01M P15C P03M P75C P105M P15M | | | | | | | E F Standard L Available A B C C RIGID RO Standard 4 5 Standard 0 | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH (i (HWX0, HWX1) 153mm 318mm (HWX3) | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) 6" | (* |
| b 17 35 50 70 100 200 350 500 700 | M Dar B17U B35U B05D B07D B01C B02C B35D B05C B05C B07C | 0.5% | MENT I psi I I I I I I I I I I I I I | P25D P05C P75D P01M P15C P03M P05M P75C P10M P15M | | | | | | | E F Standard L Available A B C C RIGID RO Standard 4 5 Standard 0 | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH ((HWX0, HWX1) 153mm 318mm (HWX3) none | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) 6" | (* |
| b 17 35 50 70 100 200 350 500 | M Dar B17U B35U B05D B07D B01C B02C B35D B05C B05C B07C | 0.5% | MENT I psi psi I I I I I I I I I I I I I | RANGI P25D P05C P75D P01M P15C P03M P05M P75C P10M P15M P15M | | | | | | | E F Standard L Available A B C C RIGID RO Standard 4 5 Standard 0 Available | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH (r (HWX0, HWX1) 153mm 318mm (HWX3) none on request | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) 6" 12.5" | (* |
| b 17 35 50 70 100 200 350 500 700 | M Dar B17U B35U B05D B07D B01C B02C B35D B05C B05C B07C | 0.5% | MENT I psi I I I I I I I I I I I I I | RANGI P25D P05C P75D P01M P15C P03M P05M P75C P10M P15M P15M | | | | | | | E F Standard L Available of A B C C RIGID RO Standard 5 Standard 0 Available of 1 | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH (n (HWX0, HWX1) 153mm 318mm (HWX3) none on request 38mm | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) 6" 12.5" | (* |
| b 17 35 50 70 100 200 350 500 700 | M Dar B17U B35U B05D B07D B01C B02C B35D B05C B05C B07C | 0.5% | MENT I psi psi I I I I I I I I I I I I I | RANGI P25D P05C P75D P01M P15C P03M P05M P75C P10M P15M P15M | | | | | | | E F Standard L Available A B C C RIGID RO Standard 4 5 Standard 0 Available 1 2 | 610mm 760mm (HWX3) 711mm on request 76mm 152mm 300mm D LENGTH (((HWX0, HWX1) 153mm 318mm (HWX3) none on request 38mm 50mm | 24" 30" 28" 3" 6" 12" mm/inches) , HWX2) 6" 12.5" 4" 12.5" 2" | (* |

accuracy, 700 bar pressure range, 1/2-20 UNF threading, 153 mm (6") rigid rod, 457 mm (18") flexible rod, T4 temperature class (-20°C...+85°C).

Sensors are manufactured in compliance with:

- EMC compatibility directive

- RoHS directive

- ATEX directive

- machinery directive

Electrical installation requirements and conformity certificate are available on our web site: www.gefran.com

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

GEFRAN

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(*) max. combined rigid / flexible stem length is 914mm - 36"