1830/1840 Series
High Performance Level Pressure Sensors

- Ranges from 0.75 mH₂O to 600 mH₂O
- Accuracy ±0.06%
- Fully welded 175 mm titanium construction
- Integral lightning surge arrester
- Polyurethane and hydrocarbon resistant cables
- Full range of installation accessories
Established in 1972, GE Druck specialises in the manufacture of high performance pressure measurement and related control equipment. The PDCR 1830/1840 transducer (mV output) and PTX 1830/1840 transmitter (4-20 mA output) are the latest generation of fully submersible high performance sensors for measurement of hydrostatic liquid levels.

The PDCR/PTX 1830/1840 series incorporates many enhanced features gained from Druck's experience in supplying thousands of sensors for small and large scale installations worldwide. Example applications include:

- **Potable Water**
  From ground water borehole to surface water level measurements in rivers, canals and reservoirs.

- **Waste Water and Remediation**
  Monitoring of secondary and outflow sewage levels within certified hazardous areas and contaminated ground water levels in land fill sites.

- **Tank Level**
  From land based liquid storage vessels to on-board ship ballast tank monitoring within safe and certified hazardous areas, using potable water approved (1830) cable and hydrocarbon resistant (1840) cable.

- **Sea Water**
  Marine environmental applications including tide gauging, coastal/flood protection and wave profiling amongst others.

**Reliability and Data Quality**

The combination of a high technology sensor, together with advanced signal conditioning and packaging techniques, provides an ideal long-term solution for reliable, accurate and economical level measurements.

The GE Druck micromachined silicon element is sealed within an all-titanium pressure module assembly, fully isolated from the pressure media. This is contained in a slimline, welded titanium body, terminated in an injection moulded cable assembly. The cable features a kevlar strain cord and is IP68 rated for indefinite immersion in 700 mH2O, with selection of cable material to meet the application.

**Lightning Surge Protection**

An optional integral lightning surge arrester is available, qualified to the highest European standard IEC 61000-4-5 (level 4). This protects the sensor from raised earth potentials caused by lightning strikes, which often occur in surface water applications.

**Ease of Use**

A simple datum marked cable system is provided for ease of installation. Incremental 1 m datum points are clearly marked for quick and accurate alignment below ground level. In addition, a full range of related accessories simplifies installation, operation and maintenance.

- Quick-release cable clamp assembly
- Slimline and short profile sink weights
- Moistureproof Sensor Termination Enclosure
- In-situ pressure test/calibration adaptors
STANDARD SPECIFICATIONS

Pressure Measurement
Operating Pressure Ranges
PDCR 1830/1840 (mV)
- 0.75, 1.5 mH₂O gauge, 3.5, 7, 10, 15, 20, 35, 50, 70, 100, 150, 200, 350, 600 mH₂O gauge and absolute
- PTX 1830/1840 (mA)
  - Any zero based full scale (FS) from 0.75 to 600 mH₂O gauge.
  - 3.5 to 600 mH₂O absolute.
  - Elevated zero, compound and reversed output ranges available.
  - Refer to GE Druck for further information.
  - Other units may be specified e.g. ftH₂O, lnH₂O, bar, mbar, psi, kpa, kg/cm²

Pressure Containment
- 10 x for ranges up to 3.5 mH₂O gauge
- 6 x for ranges above 3.5 mH₂O gauge (1400 mH₂O max.)
- 200 bar for absolute ranges.

Media Compatibility
Fluids compatible with titanium (body), acetal (nose cone) and polyurethane or Hytrel 6108 (cable assembly).

Excitation Voltage
PDCR 1830/1840 (mV)
- 10 V at 5 mA nominal
- Output is fully ratiometric to supply within 2.5 V to 12 V limits.
PTX 1830/1840 (mA)
- 9 to 30 V
- 9 to 28 V for Intrinsically Safe version.

The minimum supply voltage (Vsupply) which must appear across the pressure transmitter terminals is 9 V and is given by the following equation:

Vsupply = Vsupply - (0.02 x Rloop)

Where Vsupply is supply voltage in Volts
Rloop is total loop resistance in Ohms

Pulse Power Excitation
Recommended power-on time before output sample is taken:
PDCR 1830/1840 - 10 msec
PTX 1830/1840 - 30 msec

For pulse power operation refer to technical note.

Output Signal
PDCR 1830/1840
- 25 mV for 0.75 mH₂O range
- 50 mV for 1.5 mH₂O and 3.5 mH₂O ranges
- 100 mV for ranges 7 mH₂O and above
PTX 1830/1840
- 4 to 20 mA proportional for zero to FS pressure.

Common Mode Voltage - PDCR 1830/1840
- Typically +3.5 V to +9 V with respect to the negative supply

Output Impedance - PDCR 1830/1840
- 2 KΩ nominal

Performance Specification
Accuracy
- Combined effects of Non-linearity, Hysteresis and Repeatability:
  - Standard: ±0.1% FS BSL maximum
  - Option D: ±0.06% FS BSL maximum (±0.08% max. for 1 mH₂O and below).

Zero Offset and Span Setting
PDCR 1830/1840
- Typical: ±1.5 mV
- Maximum: ±3 mV
PTX 1830/1840
- Maximum: ±0.05 mA

Long-Term Stability
- ±0.1% typically per annum.

Operating Temperature Range
- -20° to 60°C.

Compensated Temperature Range
- -2° to 30°C.

Temperature Effects
- ±0.3% FS for 3.5 mH₂O range and above
- For ranges below 3.5 mH₂O multiply x 2.

Shock and Vibration
- MIL-STD-810E, method 514.4. Category 10 min. Figure 514.4-16
- Product will withstand 20 g peak shock half sine wave 9 mS duration in all axes, also 2000 g peak shock 0.5 mS duration in all axes.

Insulation
- Standard: >100 MΩ at 500 Vd.c.
- Intrinsically Safe version: <5 mA at 500 Va.c.

EMC and Surge Protection
- CE Marked. PTX 1830/1840: IEC 61000-6-2: 1999 (10V/m Heavy Industrial)

Intrinsic Safety
PDCR 1830/1840
- Certificated (BAS02ATEX1250X) for use with IS barrier systems to EEx ia IIC T4 (80°C ambient) for cable lengths up to 29 metres maximum.
PTX 1830/1840
- Certificated (BAS 01 ATEX 1018X) for use with IS barrier systems to EEx ia IIC (-40°C <= Tamb <= 80°C) for cable lengths up to 300 metres maximum.

Physical Specification
Pressure Connection
- Standard: Radial holed M14 x 1.5 mm male thread fitted with protective acetal nose cone.
- Option C: Screw on welded male pressure connectors available
  - G1/8B (60° Int Cone)
  - G1/4B (60° Int Cone or Flat End)
  - 1/4” NPT
  - 7/16 UNF to MS33656-4

Electrical Connection
PDCR 1830: Vented polyurethane cable with integral Kevlar strain relief cord rated to 54 kg load. Water ingress protection IP68 to 700 mH₂O.
PTX 1830/1840
- Vented Hytrel 6108 cable (hydrocarbon resistant).

Cable Lengths
To be specified as required in 1 metre increments up to 500 metres.
For longer lengths refer to GE Druck.

Documentation
Detailed user instructions are supplied with specific calibration data.
Supplied in English, French, German, Italian, Spanish or Portuguese language - selected on order.
**OPTIONS**

(A) Lightning Surge Arrestor (PTX 1830/1840 only)
   Integral lightning protection assembly certified to European standard IEC 61000-4-5 (level 4).

(B) Intrinsically Safe Version

(C) Alternative Pressure Connection
   In place of the standard acetal nose cone, a screw-on welded male pressure connection can be supplied. Refer to specifications.

(D) Improved Accuracy
   An improved accuracy of $\pm 0.06\%$ FS BSL is available ($\pm 0.08\%$ FS BSL for ranges below 1 mH2O).

**ACCESSORIES**

A full range of accessories is available to enhance installation, operation and maintenance of the 1830 series as listed below:

- **STE Moistureproof Sensor Termination Enclosure** (202-034-01)
- **Slimline Sink Weight** 175 mm Diameter (DA2608-1-01)
- **Short Sink Weight** 25.4 mm Diameter (DA4608-1-01)
- **Cable Clamp System** (192-373-01)
- **360° Rotatable Calibration Adaptor** (DA4112-1-01)
- **Economical Direct Calibration Adaptor** (DA2537-1-01)

**RELATED PRODUCTS**

GE Druck manufactures a wide range of pressure transducers and transmitters, associated digital indicators, barometers, and a complete range of precision process calibrators and controllers for the field, workshop and laboratory. A selection of these is shown below:

- RTX 1000 rangeable transmitter
- PTX 7500 industrial transmitter
- DPI 610 portable pressure calibrator
- UPS III Loop calibrator
- DPI 280 programmable level digital indicator
- DPI 515 high speed precision pressure controller/calibrator

Please refer to GE Druck for further information on related products.

**ORDERING INFORMATION**

Please state the following:

1. Model PDCR 1830 (mV) or PTX 1830 (mA) - Polyurethane cable
   Model PDCR 1840 (mV) or PTX 1840 (mA) - Hytrel 6108 cable
2. Pressure range and scale units
3. Options (if required)
4. Cable length required
5. End user instruction manual language
6. Accessories (order as separate items)

Continuing development sometimes necessitates specification changes without notice.

**INSTALLATION DRAWINGS**

- Dimensions mm

**Electrical Connections**

**PDCR 1830** - Polyurethane cable
**PDCR 1840** - Hytrel 6108 cable

- Red: Supply positive
- White: Supply negative
- Yellow: Output positive
- Blue: Output negative
- Screen wire connected to case
  (IS version - screen not connected)
- Remaining cores not connected

**PTX 1830** - Polyurethane cable
**PTX 1840** - Hytrel 6108 cable

- Red: Supply positive
- Blue: Supply negative
- Screen wire connected to case
  (IS version - screen not connected)
- Remaining cores not connected