



GE Druck

1830/1840 Series

High Performance Level Pressure Sensors

- Ranges from 0.75 mH₂O to 600 mH₂O
- Accuracy $\pm 0.06\%$
- Fully welded 17.5 mm titanium construction
- Integral lightning surge arrestor
- Polyurethane and hydrocarbon resistant cables
- Full range of installation accessories



PDCR/PTX 1830/1840 Series

High Performance Level Pressure Sensors

ADVANCED PRESSURE SENSORS FOR A WORLD OF LEVEL MEASUREMENTS

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.

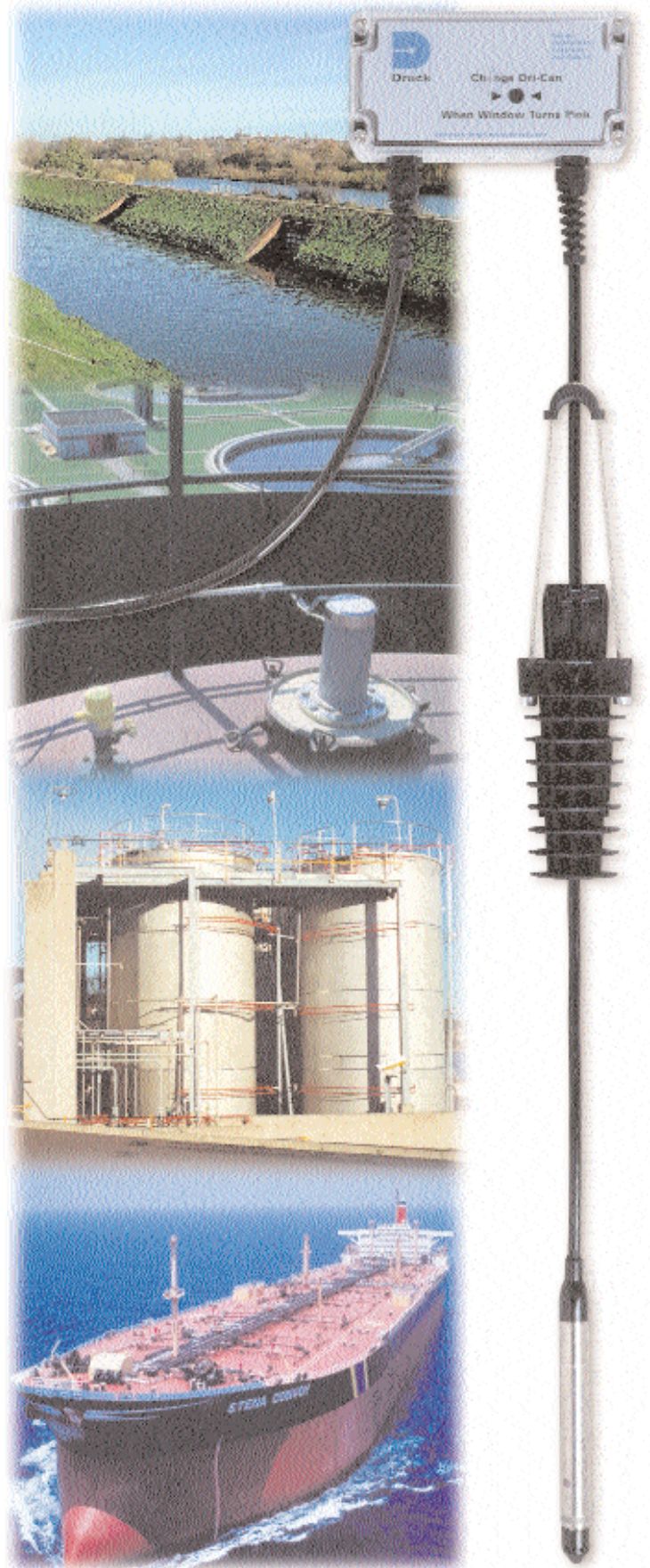
Lightning Surge Protection

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

Overpressure

The operating FS pressure range may be exceeded by the following multiples with negligible effect on calibration:

8 x for ranges up to 1.5 mH₂O

6 x for ranges above 1.5 mH₂O to 3.5 mH₂O

4 x for ranges above 3.5 mH₂O (1400 mH₂O max.)

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 (V_{MIN}) which must appear across the pressure transmitter terminals is 9 V and is given by the following equation:-

$$V_{MIN} = V_{SUP} - (0.02 \times R_{LOOP})$$

Where V_{SUP} is supply voltage in Volts

R_{LOOP} 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 K Ω nominal

Performance Specification

Accuracy

Combined effects of Non-linearity, Hysteresis and Repeatability:

Standard: $\pm 0.1\%$ FS BSL maximum

Option D: $\pm 0.06\%$ FS BSL maximum ($\pm 0.08\%$ 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

$\pm 0.1\%$ typically per annum.

Operating Temperature Range

-20° to 60°C.

Compensated Temperature Range

-2° to 30°C.

Temperature Effects

$\pm 0.3\%$ 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 M Ω 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

Certified (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

Certified (BAS 01 ATEX 1018X) for use with IS barrier systems to EEx ia IIC (-40°C \leq Tamb \leq 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

1830: Vented polyurethane cable with integral Kevlar strain relief cord rated to 54 kg load. Water ingress protection IP68 to 700 mH₂O.

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 provided with specific calibration data.

Supplied in English, French, German, Italian, Spanish or Portuguese language - selected on order.

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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.

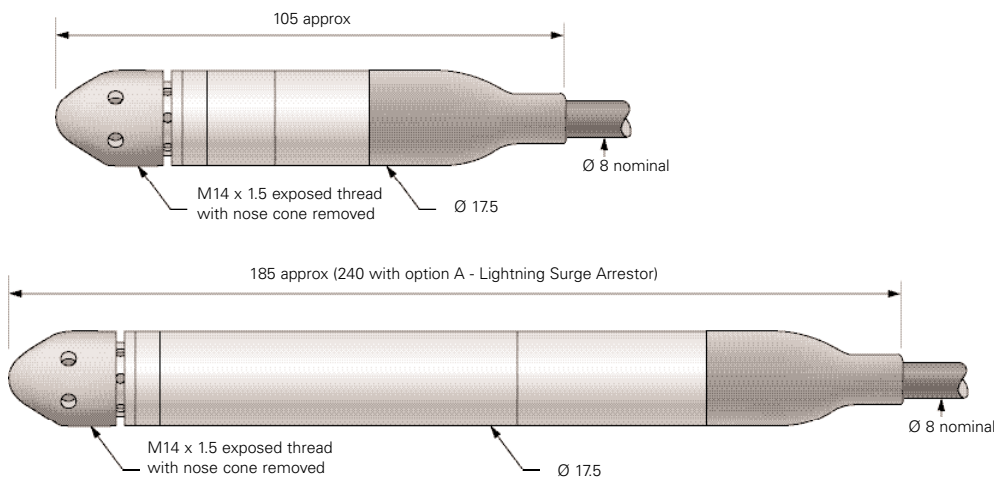
ORDERING INFORMATION

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



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Group



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