1830 SERIES

PDCR/PTX 1830 Series

Druck

High Performance Level Pressure Sensors

- Ranges from 0.75m$H_2$0 to 600m$H_2$0
- Accuracy ±0.06%
- Fully welded titanium construction
- Integral lightning surge arrestor
- Compact 17.5mm diameter package
- Full range of installation accessories

PDCR/PTX 1830 Series

High Performance Level Pressure Sensors

ADVANCED PRESSURE SENSORS FOR A WORLD OF LEVEL MEASUREMENTS

Established in 1972, Druck specialises in the manufacture of high performance pressure measurement and related control equipment. The PDCR 1830 transducer (mV output) and PTX 1830 transmitter (4-20mA output) are the latest generation of fully submersible high performance sensors for measurement of hydrostatic liquid levels.

The PDCR/PTX 1830 series incorporate 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; 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.

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

Reliability and Data Quality

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

The 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 700mH_2O.

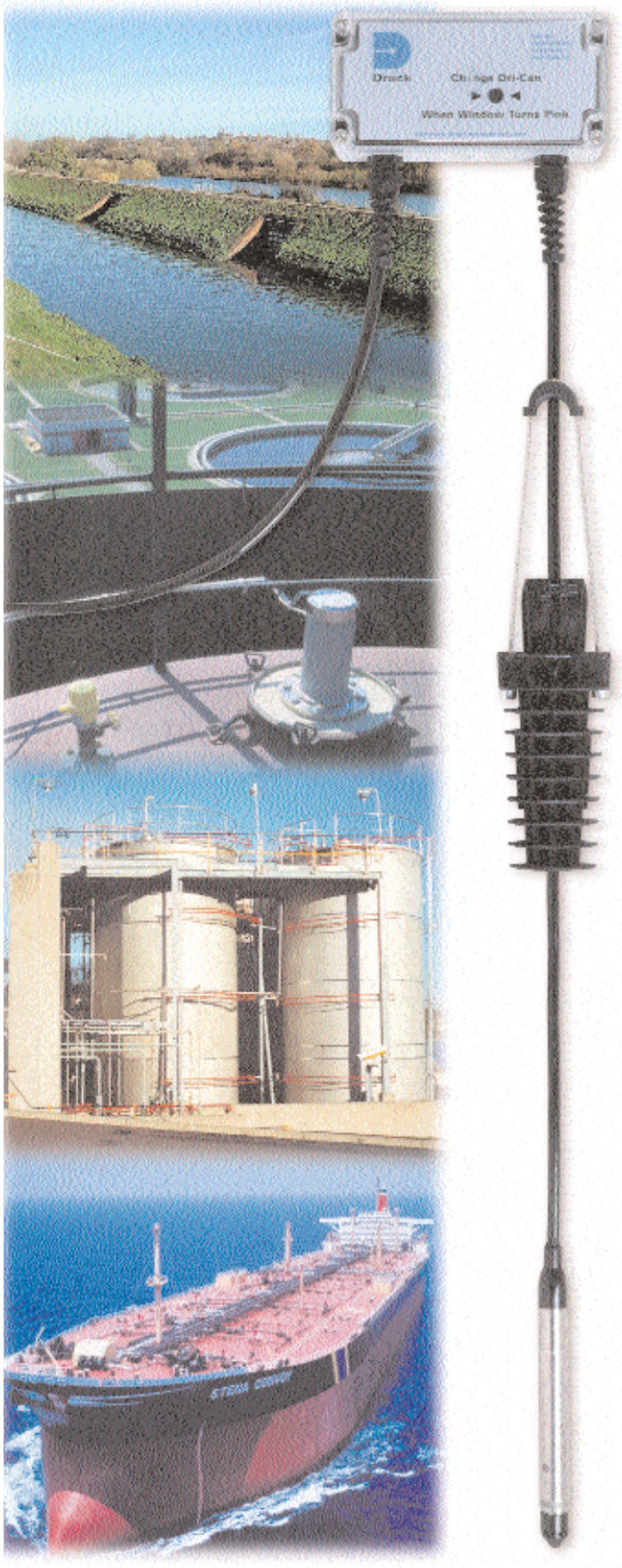
Lightning Surge Protection

An optional integral lightning surge arrestor 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 1m datum points are clearly marked for quick and accurate alignment below ground level. In addition, a full range of related accessories simplify installation, operation and maintenance.

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



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STANDARD SPECIFICATIONS

Pressure Measurement

Operating Pressure Ranges

PDCR 1830 (mV)

0.75, 1.5mH_2O gauge, 3.5, 7, 10, 15, 20, 35, 50, 70, 100, 150, 200, 350, 600mH_2O gauge and absolute

PTX 1830 (mA)

Any zero based full scale (FS) from 0.75 to 600mH_2O gauge.
3.5 to 600mH_2O absolute.

Elevated zero, compound and reversed output ranges available.
Refer to Druck for further information.

Other units may be specified e.g. ftH_2O, InH_2O, bar, mbar, psi, kpa, kg/cm^2

Overpressure

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

8 x for ranges up to 1.5mH_2O

6 x for ranges above 1.5mH_2O to 3.5mH_2O

4 x for ranges above 3.5mH_2O (1400mH_2O max.)

Pressure Containment

10 x for ranges up to 3.5mH_2O gauge

6 x for ranges above 3.5mH_2O gauge (1400mH_2O max.)

200 bar for absolute ranges.

Media Compatibility

Fluids compatible with titanium (body), acetal (nose cone) and polyurethane (cable assembly).

Excitation Voltage

PDCR 1830 (mV)

10V at 5mA nominal

Output is fully ratiometric to supply within 2.5V to 12V limits.

PTX 1830 (mA)

9 to 30V

9 to 28V for Intrinsically Safe version.

The minimum supply voltage (V_{MIN}) which must appear across the pressure transmitter terminals is 9V 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 - 10msec

PTX 1830 - 30msec

For pulse power operation refer to technical note.

Output Signal

PDCR 1830

25mV for 0.75mH_2O range

50mV for 1.5mH_2O and 3.5mH_2O ranges

100mV for ranges 7mH_2O and above

PTX 1830

4 to 20mA proportional for zero to FS pressure.

Common mode voltage - PDCR 1830

Typically +3.5V to +9V with respect to the negative supply

Output Impedance - PDCR 1830

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 1mH_2O and below).

Zero Offset and Span Setting

PDCR 1830

Typical: ±1.5mV

Maximum: ±3mV

PTX 1830

Maximum: ±0.05mA

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 3.5mH_2O range and above

For ranges below 3.5mH_2O multiply x 2.

Shock and Vibration

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

Insulation

Standard: >100MΩ at 500V d.c.
Intrinsically Safe version: <5mA at 500V a.c.

EMC and Surge Protection

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

Intrinsic Safety

PDCR 1830

Certified (Ex 94C2539) for use with IS barrier systems to EEx ia IIC T4 (80°C ambient) for cable lengths up to 29 metres maximum.

PTX 1830

Certified (BAS 01 ATEX 1018X) for use with IS barrier systems to EEx ia IIC (-40°C <= Tamb <= 80°C) for cable lengths up to 300metres maximum.

Physical Specification

Pressure Connection

Standard: Radial holed M14 x 1.5mm male thread fitted with protective acetal nose cone.

Option C: Screw on welded male pressure connectors available

- $G^1/_8$B (60° Int Cone)
- $G^1/_4$B (60° Int Cone or Flat End)
- $^1/_4$" NPT
- $^7/_{16}$ UNF to MS33656-4

Electrical Connection

Vented polyurethane cable with integral Kevlar strain relief cord rated to 54kg load. Water ingress protection IP68 to 700mH_2O.

Cable Lengths

To be specified as required in 1 metre increments up to 500 metres.
For longer lengths refer to 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)
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 ±0.06% FS BSL is available (±0.08% FS BSL for ranges below 1mH_2O).

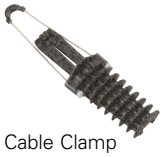
ACCESSORIES

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

STE moisture proof Sensor Termination Enclosure (202-034-01)

Slimline Sink Weight 17.5mm Diameter (DA2608-1-01)

Short Sink Weight 25.4mm Diameter (DA4608-1-01)



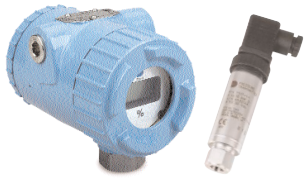
Cable Clamp System (192-373-01)

360° Rotatable Calibration Adaptor (DA4112-1-01)

Economical Direct Calibration Adaptor (DA2536-1-01)

RELATED PRODUCTS

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

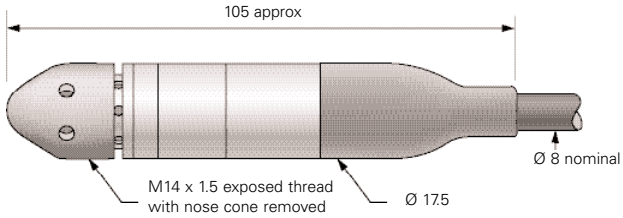
Please refer to Druck for further information on related products.

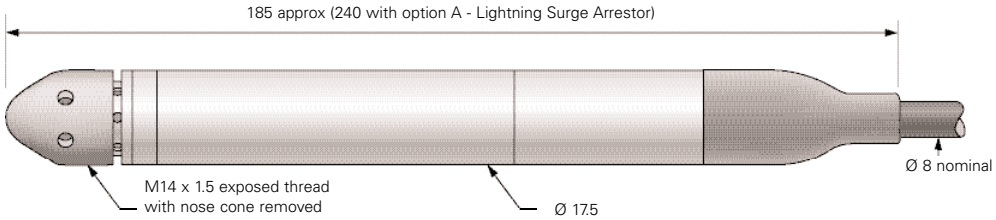
ORDERING INFORMATION

Please state the following:
(1) Model PDCR 1830 (mV) or PTX 1830 (mA)
(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

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

Red:	Supply positive
Blue:	Supply negative

Screen wire connected to case
(IS version - screen not connected)
Remaining cores not connected

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UKAS CALIBRATION 0221

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