GE
Measurement & Control

1800 Series

Druck High Performance Level Pressure Sensors

The PDCR 1800 transducer (mV output) and the PTX 1800 transmitter (4 to 20 mA output) are the latest generation of fully submersible titanium high performance sensors for measurement of hydrostatic liquid levels.

Features

- Ranges from 0.75 mH_2O to 600 mH_2O
- Accuracy ±0.10% full scale (FS) best straight line (BSL)
- Fully welded 17.5 mm diameter titanium construction
- Polyurethane and hydrocarbon resistant cables
- Full range of installation accessories

Applications

The 1800 Series incorporates many enhanced features gained from 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 and contaminated ground water levels in land fill sites.

- Tank Level
From land based liquid storage vessels to on-board ship ballast tank monitoring.

- 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 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 mH_2O, with a selection of cable materials to meet the application.

Ease of Use

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

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

1800 Series Specifications

Pressure Measurement

Operating Pressure Ranges

PDCR 1800 (mV)
0.75, 1.5 mH_2O gauge, 3.5, 7, 10, 15, 20, 35, 50, 70, 100, 150, 200, 350, 600 mH_2O gauge and absolute
Other units may be specified

PTX 1800 (mA)
Any zero based FS from 0.75 to 600 mH_2O gauge and 3.5 to 600 mH_2O absolute.
Other units may be specified, such as ftH_2O, inH_2O, bar, mbar, kPa, kg/cm^2, psi

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 mH_2O
- 6 x for ranges above 1.5 to 3.5 mH_2O
- 4 x for ranges above 3.5 mH_2O (1400 mH_2O max.)

Pressure Containment
- 10 x for ranges up to 3.5 mH_2O gauge
- 6 x for ranges above 3.5 mH_2O gauge (1400 mH_2O maximum)
- 200 bar for absolute ranges

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

1800 Series Specifications

Excitation Voltage
PDCR 1800 (mV)
10 V at 5 mA nominal
Output is ratiometric to supply
within 2.5 V to 12 V limits.

PTX 1800 (mA)
9 to 30 V

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, and
R_{LOOP} is total loop resistance in Ohms

Pulse Power Excitation
Recommended power-on time before output sample:
- PDCR 1800: 10 ms
- PTX 1800: 30 ms

Output Signal
PDCR 1800
- 25 mV for 0.75 mH_2O range
- 50 mV for 1.5 and 3.5 mH_2O ranges
- 100 mV for ranges 7 mH_2O and above

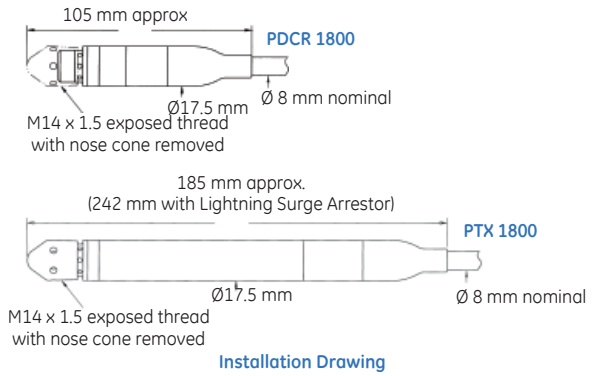
PTX 1800
4 to 20 mA, proportional for zero to FS pressure

Common Mode Voltage - PDCR 1800
Typically +3.5 V to +9 V
with respect to the negative supply

Output Impedance - PDCR 1800
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% FS BSL max. for 1 mH_2O and below)



Installation Drawing

Electrical Connections

PDCR 1800 - Polyurethane cable
PDCR 1800 - 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 1800 - Polyurethane cable
PTX 1800 - Hytrel 6108 cable

Red:	Supply positive
Blue:	Supply negative

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

Zero Offset and Span Setting
PDCR 1800
- *Typical:* ±1.5 mV
- *Maximum:* ±3 mV

PTX 1800
- *Maximum:* ±0.04 mA

Long-Term Stability
±0.1% FS per annum

Operating Temperature Range
-20 to 60°C (-4 to 140°F)

Compensated Temperature Range
-2 to 30°C (28 to 86°F)

Temperature Effects
- ±0.3% FS Temperature Error Band (TEB)
  for 3.5 mH_2O range and above
- ±0.6% FS TEB for ranges below 3.5 mH_2O

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 Vdc
Intrinsically Safe Version: <5 mA at 500 Vac

1800 Series Specifications

Intrinsic Safety (Option B)

PDCR 1800: *ATEX Certified* (BAS02ATEX1250X) for use with IS barrier systems to EEx ia IIC T4 (-40°C ≤ T_a ≤ 80°C) for cable lengths up to 29 metres

PTX 1800: *ATEX and IECEx Certified* (BAS01ATEX1018X and IECEx BAS10.0077X) for use with IS barrier systems to Ex ia I Ma (40°C ≤ T_a ≤ +80°C) and Ex ia IIC T4 Ga (-40°C ≤ T_a ≤ +80°C) for cable lengths up to 300 metres

Lightning Surge Arrestor (PTX versions only):
Integral lightning protection assembly certified to Standard IEC 61000-4-5 (Level 4)

Physical Specification

Pressure Connection (Option C)

Standard: Radial holed M14 x 1.5 mm male thread fitted with protective acetyl nose cone
Option C: Screw on welded male pressure connection available (PTX 1800 only):
G1/4 Male flat end
G1/4B (flat end) 6mm hole
1/4 NPT Male
M12 x 1 Male
1/8-27 NPT Female
M14 x 1.5 60° Int Cone

Electrical Connection

1830: Vented polyurethane cable with integral Kevlar® strain relief cord rated to 54 kg load. Water ingress protection IP68 to 700 mH_2O
1840: Vented Hytrel® 6108 cable (hydrocarbon resistant) with integral Kevlar® strain relief cord rated to 54 kg load. Water ingress protection IP68 to 700 mH_2O

Cable Lengths

To be specified as required in 1 metre increments up to 500 metres (for IS restrictions see *Intrinsic Safety* above). For longer lengths refer to GE Measurement & Control.

CE Marking

CE marked for electromagnetic compatibility and, for ATEX version only, use in potentially explosive atmospheres

Documentation

Detailed user instructions are provided with specific calibration data. They are supplied in English, French, German, Italian, Spanish or Portuguese.
Language selected on order

Accessories

A full range of accessories is available to enhance installation, operation and maintenance of the 1800 Series as listed below:

- STE moistureproof sensor termination enclosure (202-034-05)
- Slimline sink weight Ø17.5 mm (DA2608-1-01)
- Short sink weight Ø25 mm (DA4068-1-01)
- Cable clamp system (192-373-01)
- 360° Rotatable calibration adaptor to: G1/8 (DA4112-1-01) or 1/8 NPT (DA4112-2-01)
- Economical direct calibration adaptor to: G1/8 (DA2537-1-01)
- Accessory pack contains (S01830E) STE box, Slimline sink weight, cable clamp, direct calibration adaptor

Options

(B) Intrinsically Safe Version
(C) Alternative Pressure Connection (PTX 1800 only)
In place of the standard acetyl nose cone, a welded male pressure connection can be supplied
(D) Improved Accuracy

Ordering Information

Please state the following:

(1) Select model number

Code	Model
PDCR 18	mV output
PTX 18	mA output

Code	Cable type
3	Polyurethane
4	Hytrel® 6108

Code	Lightning Surge Arrestor
0	Not Required
5	Fitted

____ - _____ - ____

(2) Pressure range and scale units
(3) Options (if required)
(4) Cable length required
(5) Accessories (order as separate items)
(6) Supporting Services (order as separate items)

Supporting Services

Our highly trained staff can support you, no matter where you are in the world. We can provide training, nationally accredited calibration - both initially and at periodic intervals - extended warrantee terms and even rental of portable or laboratory calibrators. Further details can be found at www.gemeasurement.com.

www.gemeasurement.com

920-655B