

# ADROIT6200

## Pressure sensing platform

The new ADROIT6200 is a high performance, robust pressure measurement device. It combines the best mechanical properties of micromachined silicon in a fully welded 316L stainless steel body with the latest digital processing capability to offer levels of accuracy, previously unavailable in a device of this type. It offers a full suite of pressure measurement including gauge, absolute and differential references and pressure ranges from 200 mbar to 350 bar



### Digital and Analogue

By using digital signal processing, the highest levels of performance over temperature are achieved. However, the final stage of processing converts the signal back into a conventional analogue output for easy interfacing to existing infrastructure. Fast ASIC technology ensures response times around 1 ms and fast switch on for pulse power operation. The digital processing also enables the replacement of mechanical adjustment to potentiometers with automatic calibration adjustment using an App.

### Small and Robust

The highest-grade components are designed to withstand high levels of shock, vibration and temperature extremes. Components are welded into a small, convenient, 19 mm diameter package to offer best in class performance in the harshest environments.

### Druck Expertise

Druck have used 50 years of experience to design the ADROIT6200. From the silicon processing, through the mechanical construction of the pressure sensing module and electronics design, to the selection of electrical connectors, each components performance has been optimized to meet your requirements. Our team of experts can help you make the optimum product selection for your application.

### Features

- Performance to 0.02%
- Pressure ranges from 200 mbar to 350 bar (3 to 5000 psi)
- Gauge, Absolute and Differential reference
- 4-20 mA and configurable voltage output
- Total Accuracy up to 0.1%
- Frequency response to 1 kHz
- 316L Stainless Steel construction
- Operating Temperature range up to -40 °C to 125 °C survival from -55 °C to 150 °C

# Measurement

## Operating Pressure Ranges

### Gauge ranges (g)

Zero and non-zero based ranges

Upper range Limit (URL): 200 mbar to 70 bar

Lower range limit (LRL): -1 to 35 bar

Span limit: Span must be greater than 50% of the URL

### Sealed Gauge ranges (sg)

Zero and non-zero based ranges

Upper range Limit (URL): 10 bar to 350 bar

Lower range limit (LRL): -1 to 175 bar

Span limit: Span must be greater than 50% of the URL

### Absolute ranges (a)

Zero and non-zero based ranges

Upper range Limit (URL): 350 mbar to 350 bar

Lower range limit (LRL): 0 to 175 bar

Span limit: Span must be greater than 50% of the URL

### Barometric (b)

Upper range Limit (URL): 1.3 bar

Lower range limit (LRL): 350 mbar

Span limit: Span must be greater than 350 mbar

### Wet Dry Differential (WD)

Zero and non-zero based ranges

Upper range Limit (URL): 350 mbar to 35 bar

Lower range limit (LRL): -1 bar to 0 bar

Span limit: Span must be greater than 50% of the URL

### Wet Wet Differential (WW)

Zero and non-zero based ranges

Upper range Limit (URL): 350 mbar to 35 bar

Lower range limit (LRL): -1 bar to 0 bar

Span limit: Span must be greater than 50% of the URL

## Over-pressure

The following pressure can be applied without causing a shift in calibrated accuracy:

- 6 x FS for ranges up to 700 mbar
- 2 x FS for barometric ranges
- 4 x FS for ranges up to 70 bar (200 bar max)
- 4 x FS for ranges up to 350 bar (700 bar max)

For differential versions the negative side must not exceed the positive side by more than:

- 4 x FS for ranges up to 700 mbar
- 2 x FS for all other ranges up to a maximum of 15 bar

## Containment Pressure

| Form  | Pressure Range    | Containment Pressure  |
|---|-------------------|---|
| Gauge Absolute                                  | ≤10 bar           | 6 x FS  |
| Barometric Sealed Gauge Differential (+ve port) | >10 bar ≤ 350 bar | 6 x FS (525 bar maximum)  |
| Differential (-ve port)                         |                   | Must not exceed positive port by more than 4 x FS (15 bar maximum). |

## Electrical Parameters

### Outputs

- 4–20 mA
- 0–5 volts 3-wire non true-zero\*
- Configurable: 3-wire voltage output versions within the range of 0 to 10 V with the following limitations:
  - Minimum span of 4 V
  - Maximum lower limit elevation equal to the span

### Examples:

| Valid        | Invalid                      |
|--------------|------------------------------|
| 1 to 6 V     | 1 to 3 V (span too small)    |
| 0.5 to 4.5 V | 6 to 10 V (offset too large) |

Output voltage range can be specified to a resolution of 0.1 V

The output will respond to at least 110% of the applied pressure

\* Non true-zero, the output will saturate at < 50 mV.

## Supply Requirements

### 4–20 mA output

12–28 Vdc

### Voltage output

7–28 Vdc < 3mA

Supply voltage must be 2 V greater than the output voltage selected

### Insulation

Greater than 100 MΩ at 500 Vdc.

### Power On Time

From power on to a stable reading within specification

Less than 30 ms

## Performance Specification

### Accuracy

Including zero and span setting accuracy, NLH&R and thermal error:

|          | Total Accuracy % of Span | NLH&R (Non-linearity Hysteresis and Repeatability) at 23°C |
|----------|--------------------------|--|
| Premium  | 0.10                     | 0.02 % Span BSL (Best Straight Line)                       |
| Improved | 0.20                     | 0.04 % Span BSL  |

Values increase pro-rata for pressure spans less than 1000 mbar and double for barometric ranges.

### Response time

Less than 1 ms

### Stability

Long-term stability 0.05% Span/year typical (0.1% Span/year max), increasing pro-rata for pressure ranges below 700 mbar.

### Line Pressure effects (differential versions only)

- Zero Shift  $\leq \pm 0.03\%$  Span /bar of line pressure
- Span shift  $\leq \pm 0.03\%$  Span /bar of line pressure
- Effects increase pro-rata for differential ranges below 700 mbar

### Orientation sensitivity

#### Gauge, absolute, and wet-dry differentials

Units are calibrated mounted pressure connection down. Output will change by less than 1 mbar /g which can be zeroed out during calibration

#### Wet-wet differentials

Units are calibrated with the positive port down. Output will change by less than 5 mbar/g which can be zeroed out during calibration.

### Vibration and Shock

Sinusoidal Vibration to DO-160G Curve W. 5 to 2000 Hz, 30g peak.

Random vibration to DO-160G Cat. R (robust) Curves D1+E1. 10 to 2000 Hz, peak ASD  $0.16g^2/Hz$ .

Random vibration to BS EN 61373:2010. 5 to 250 Hz, peak ASD  $6.12g^2/Hz$ .

Shock, 1000g half-sine for 1 ms.

## Physical Specifications

### Environmental protection

See Electrical connectors section

### Operating temperature range

See Electrical connectors section

### Pressure media compatibility

Fluids compatible with Stainless Steel 316L and Hastelloy C276

## Enclosure materials

Stainless steel 316L body.

| Connector type                   | Material for TB temp range               | Material for TD temp range |
|----------------------------------|--|----------------------------|
| Polyurethane cable (metal crimp) | Polyurethane                             | Not available              |
| Raychem cable (metal crimp)      | Raychem                                  | Raychem                    |
| MIL-C-26482                      | PBT, Brass H62                           | Glass, Gold plated nickel  |
| M12xl Male 4-pin                 | Nylon 6, Brass H62                       | Glass, Alloy52             |
| Micro-DIN (9.4 mm pitch)         | Nylon 66, Tin plated Brass, Copper Alloy | Not available              |

## Pressure connectors

- PA: G1/4 Female
- PB: G1/4 Male Flat
- PC: G1/4 Male 60° Int Cone
- PE: 1/4 NPT Female
- PF: 1/4 NPT Male
- PG: 1/8 NPT Male
- PJ: M12 x 1 Int Cone
- PK: M12 x 1 Male 60° Int Cone
- P22: 7/16-20 UNF Flat End 74°
- PS: 1/4 Swagelok Bulkhead
- PT: G1/4 Male Flat Long
- P33: 7/16 UNF Female W/L
- RC: G1/4 Male Flat-Cross Bore
- RF: 1/4 VCR Male
- RQ: NW16 Flange
- P14: M8 x 1 Male

## Electrical connectors

| Description                       | IP Rating | Location | Operating Temperature |                            |
|-----------------------------------|-----------|----------|-----------------------|----------------------------|
|                                   |           |          | Min                   | Max                        |
| Polyurethane cable (metal crimp)  | IP65      | Indoor   | -40 °C                | +80 °C                     |
| Raychem cable (metal crimp)       | IP65      | Indoor   | -55 °C                | +125 °C                    |
| MIL-C-26482 (6 pin Shell size 10) | IP67      | Outdoor* | -55 °C                | As compensated temperature |
| M12xl Male (4 pin Type A coded)   | IP67      | Outdoor* | -55 °C                | As compensated temperature |
| Micro-DIN (9.4 mm pitch)          | IP65      | Indoor   | -40 °C                | +80 °C                     |

\*Note: Units with a compensated temperature range up to 125 °C will withstand short periods operating at temperatures up to 150 °C. Exposure to temperatures above 125 °C will shorten operating life.

## Connections

|                                   | Option Code | Wire colour / Pin No. | 4-20 mA    | Voltage    |
|-----------------------------------|-------------|-----------------------|------------|------------|
| Polyurethane cable (metal crimp)  | 1           | Red                   | +ve Supply | +ve Supply |
|                                   |             | Yellow                | -          | +ve Output |
|                                   |             | Blue                  | -          | -          |
|                                   |             | White                 | -ve Supply | 0V Common  |
|                                   |             | Screen                | Case       | Case       |
| Raychem cable (metal crimp)       | 2           | Red                   | +ve Supply | +ve Supply |
|                                   |             | White                 | -          | +ve Output |
|                                   |             | Green                 | -          | -          |
|                                   |             | Blue                  | -ve Supply | 0V Common  |
|                                   |             | Screen                | Case       | Case       |
| MIL-C-26482 (6 pin Shell size 10) | 6           | A                     | +ve Supply | +ve Supply |
|                                   |             | B                     | -          | +ve Output |
|                                   |             | C                     | -          | -          |
|                                   |             | D                     | -ve Supply | 0V Common  |
| M12x1 Male 4-pin (Type A-coded)   | G           | 1                     | +ve Supply | +ve Supply |
|                                   |             | 2                     | -          | +ve Output |
|                                   |             | 3                     | -ve Supply | 0V Common  |
|                                   |             | 4                     | -          | -          |
| Micro-DIN (9.4 mm pitch)          | A           | 1                     | +ve Supply | +ve Supply |
|                                   |             | 2                     | -ve Supply | 0V Common  |
|                                   |             | 3                     | -          | +ve Output |
|                                   |             | E                     | Case       | Case       |

## CE Conformity

- RoHS directive 2011/65/EU
- Pressure Equipment Directive 2014/68/EU Sound Engineering Practice
- EMC Directive 2014/30/EU
- BS EN 61326-1: 2013: Electrical Equipment for Measurement, Control and Laboratory Use
- BS EN 61326-2-3: 2013: Particular Requirements for Pressure Transducers
- BS EN 50121-3-2: 2016+A1: 2019: Railway applications - Electromagnetic compatibility - Rolling stock - Apparatus. 4-20 mA version only.

# Ordering Information

## 1. Select model Number

### Product Series

ADROIT6

ADROIT6200

### Diameter and Material

2 19 mm Stainless Steel

### Electrical Connector

1 Polyurethane cable (metal crimp)

2 Raychem Cable (metal crimp)

6 MIL-C-26482 Bayonet **Note 1**

D Micro DIN (9.4 mm Pitch) **Note 2**

G M12 x 1 4-Pin **Note 1**

### Electronics Option

2 4 to 20 mA

4 0 to 5 Volts 3-wire

5 Configurable Voltage 3-wire

### Compensated Temperature Range

TB -20 to +80 °C

TD -40 to +125 °C **Note 3**

### Accuracy

A2 Improved

A3 Premium **Note 4**

### Calibration

CD Total Precision and Zero and Span data

### Hazardous area approval

H0 None

### Pressure Connector

PA G1/4 Female

PB G1/4 Male Flat

PC G1/4 Male 60° Int Cone **Note 5**

PE 1/4 NPT Female

PF 1/4 NPT Male

PG 1/8 NPT Male **Note 5**

PJ M14 x 1.5 60° Int Cone **Note 5**

PK M12 x 1 Int Cone **Note 5**

P22 7/16-20 UNF flat End 74° **Note 5**

PS 1/4 Swagelok Bulkhead **Note 5 Note 8**

PT G1/4 Male Flat Long **Note 5**

P33 7/16-20 UNF Female W/L

RC G1/4 Male Flat-Cross Bore **Note 6**

RF 1/4 VCR Male **Note 8**

RQ NW16 Flange **Note 7 Note 8**

P14 M8 X 1 Male **Note 8**

ADROIT6 2 6 2 - TB - A2 - CD - H0 - PA (Example Configuration)

Note 1: Mating connector not supplied. (see Accessories, section 3)

Note 2: Mating connector supplied. (see Accessories, section 3)

Note 3: Choose from electrical connector options 2, 6 or G and a minimum pressure range of 2 bar to select TD compensated temperature range.

Note 4: Premium Accuracy is not available if TD compensated temperature range is selected

Note 5: This connection is only available on pressure ranges up to ≤350 bar.

Note 6: This connection is only available on pressure ranges between ≥10 bar and ≤350 bar.

Note 7: This connection is only available on pressure ranges up to <10 bar.

Note 8: This connection is not available with differential pressure ranges.

**2. State pressure range and units:** e.g., 0 to 10 bar, -5 to + 5 psi

Unit options are:

| Symbol             | Description     | Symbol              | Description     |
|--------------------|-----------------|---------------------|-----------------|
| bar                | bar             | mH <sub>2</sub> O   | metres water    |
| mbar               | millibar        | inH <sub>2</sub> O  | inches water    |
| psi                | pounds/sq. inch | ftH <sub>2</sub> O  | feet water      |
| Pa                 | Pascal          | mmHg                | mm mercury      |
| hPa                | hectoPascal     | inHg                | inches mercury  |
| kPa                | kiloPascal      | kgf/cm <sup>2</sup> | kg force/sq. cm |
| MPa                | MegaPascal      | atm                 | atmosphere      |
| mmH <sub>2</sub> O | mm water        | Torr                | torr            |
| cmH <sub>2</sub> O | cm water        |                     |                 |

**3. State pressure reference:** e.g., gauge

Reference options are:

- gauge
- absolute
- barometric
- sealed gauge
- wet/dry differential
- wet/wet differential

**4. Electrical Connector options 1 and 2: State cable length and units:** Integer values only in ft or m.

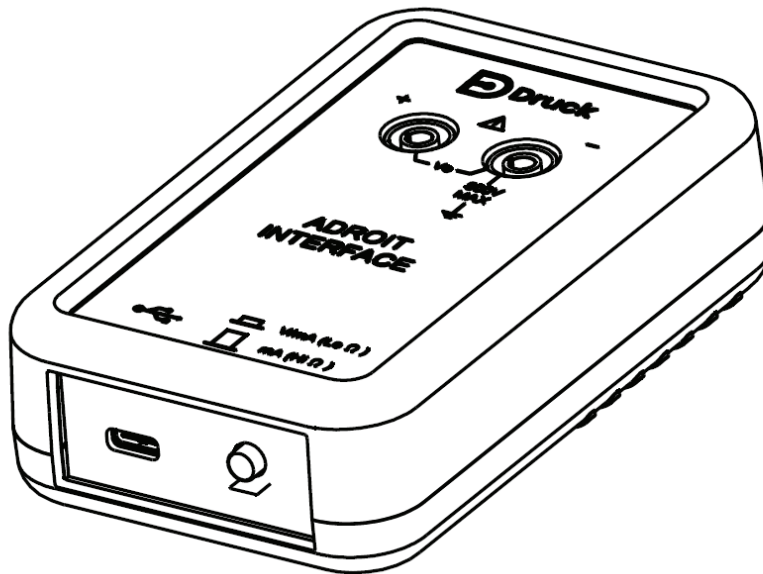
- Minimum cable length : 1 m (3 ft)
- Maximum cable length : 3 m (9 ft)

**5. Electronics option 5: State output at minimum and Maximum pressure:** e.g. output 0.5 to 4.5 V

**Request a quote here:** <http://bit.ly/Adroit6000contactus>

## Accessories (to be ordered as separate line items)

### 1. ADROIT6200 Interface box Part number : ADROIT-Interface



The interface is used with a Windows-based PC or an Android device (laptop, tablet or phone). It enables the user to make small adjustment to the zero and span settings of the sensor for calibration purposes. It is supplied with a USB lead to USB-C (Android device) or USB-A (Laptop).

### 2. Test leads

Set of 2 off 4 mm leads and crocodile clips for connection to the ADROIT6200 sensor are available. Part Number: 209-359 Part Description: UPSIII Test lead set. 2 sets are required for a calibration.

### 3. Mating connectors

- For MIL-C-26482 Bayonet Part Number 163-009
- For M12 x 1 4-Pin Part Number 149M7393-1
- For Micro DIN (9.4 mm Pitch) Part Number 192-257-01 (one supplied with each sensor)

### 4. Cable Assemblies

A made up electrical connector with a length of cable terminated in solder tinned wires

#### (1) Select Part Number

##### Main Product

UNIKCABLE

Cable Assembly

##### Electrical Connector

- 6 MIL-C-26482 Bayonet
- 7 DIN 43650
- D Micro DIN (9.4 mm Pitch)
- G M12 x 1 4 Pin

##### Cable

- 1 Polyurethane Cable
- 2 Raychem Cable

UNIKCABLE - 6 - 2 (Example Part Number)

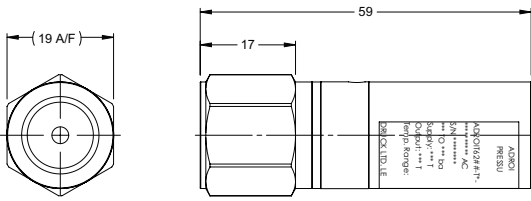
#### (2) State Cable length and units (Integer value only)

Minimum length 1m (3ft)

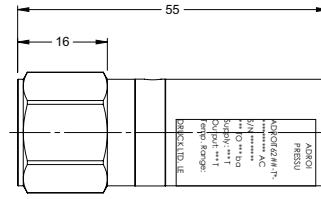
Maximum length 200m (600ft)

**Example:** UNIKCABLE-6-2 5m

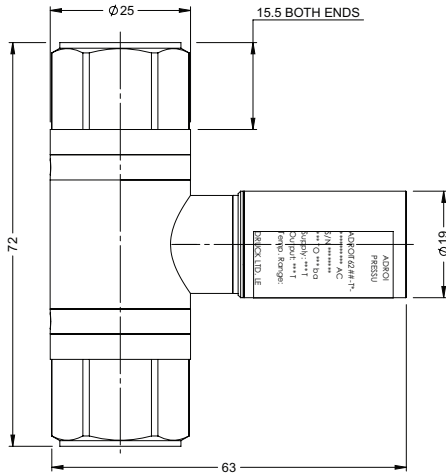
# Mechanical Drawings



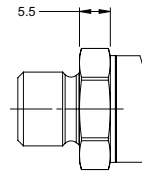
**LOW PRESSURE CONSTRUCTION**  
(PRESSURE RANGES: < 10 bar)



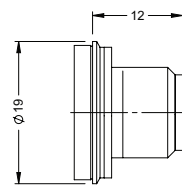
**MEDIUM PRESSURE CONSTRUCTION**  
(PRESSURE RANGES: ≥10 bar to ≤350 bar)



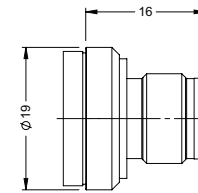
**WET/WET & WET/DRY**  
**DIFFERENTIAL**  
**CONSTRUCTION**



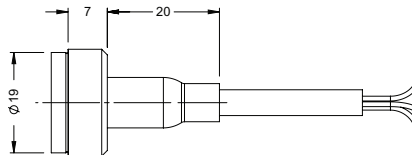
**MALE PRESSURE CONNECTION [2]**



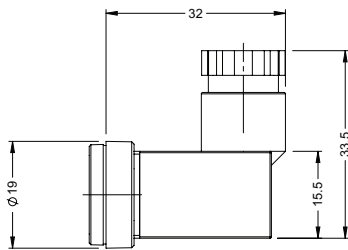
**HIGH TEMP (TD) M12x1 4-PIN**



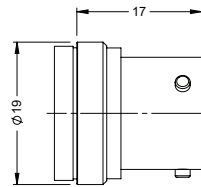
**STANDARD TEMP (TB) M12x1 4-PIN**



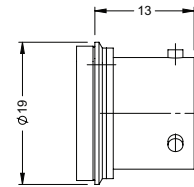
**POLYURETHANE/RAYCHEM CABLE**



**MICRO DIN (9.4 mm PITCH)**



**STANDARD TEMP (TB)**  
**MIL-C-26482 BAYONET**



**HIGH TEMP (TD)**  
**MIL-C-26482 BAYONET**

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