

ADROIT6200

Pressure sensing platform

The ADROIT6200 is a high performance, robust pressure measurement device. It combines the best mechanical properties of micromachined silicon in a fully welded stainless steel 316L 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 68 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 component's 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% span BSL
- Pressure ranges from 68 mbar to 350 bar (1 to 5000 psi)
- Gauge, Sealed Gauge, Absolute, Barometric and Differential reference
- 4-20 mA, 20-4 mA and configurable voltage output
- Total accuracy up to 0.1% span
- Frequency response to 1 kHz
- Stainless steel 316L construction
- Operating temperature range up to -40 °C to +125 °C and survival from -55 °C to +150 °C

Measurement

Operating Pressure Ranges

Gauge ranges (g)

Zero and non-zero based ranges

Upper range Limit (URL): 68 mbar to 70 bar

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

Span limit: for gauge depression ranges, Min URL is 0, span needs to be greater than 68 mbar.

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 200 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): 344 mbar to 350 bar

Lower range limit (LRL): 0 to 175 bar

Span limit: Span must be greater than 50 % of the URL. See Note 8 in ordering information.

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): 68 mbar to 35 bar

Lower range limit (LRL): -1 to 17.5 bar

Span limit: Span must be greater than 50 % of the URL. See Note 8 in ordering information.

Wet-wet differential (WW)

Zero and non-zero based ranges

Upper range Limit (URL): 344 mbar to 35 bar

Lower range limit (LRL): -1 bar to 17.5 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
- 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:

- 6 x FS for ranges up to 150 mbar
- 4 x FS for ranges up to 700 mbar
- 2 x FS for all other ranges up to a maximum of 15 bar

Differential line pressure maximum 70 bar

Containment Pressure

Form	Pressure Range	Containment Pressure
Gauge Absolute	≤70 bar	6 x FS
Barometric Sealed Gauge Differential (+ve port)	>70 bar, ≤350 bar	6 x FS (700 bar maximum)
Differential (-ve port)		Must not exceed positive port by more than 6 x FS (15 bar maximum).

Electrical Parameters

Outputs

- 4-20 mA
- 20-4 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

20-4 mA output

12-28 Vdc

Voltage output

7-28 Vdc <3 mA

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

Resolution

0.01 % FS span

Stability

Long-term stability 0.05 % Span/year typical (0.1 % Span/year max), increasing pro-rata for pressure ranges below 1 bar.

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, 30 g peak.

Random vibration to DO-160G Cat. R (robust) Curves D1+E1. 10 to 2000 Hz, peak ASD 0.16 g²/Hz.

Random vibration to BS EN 61373:2010. 5 to 250 Hz, peak ASD 6.12 g²/Hz.

Shock, 1000 g half-sine for 1 ms.

Physical Specifications

Environmental protection

See Electrical connectors section.

Mass

60 g approx.

Operating temperature range

See Electrical connectors section.

Pressure media compatibility

Fluids compatible with stainless steel 316L and Hastelloy C276.

Not suitable for media that has an oxygen concentration >21% or other strong oxidizing agents. This product contains materials or fluids that may degrade or combust in the presence of strong oxidizing agents.

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
M12x1 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: M14 x 1.5 60° Int Cone
- PK: M12 x 1 Male 60° Int Cone
- PS: 1/4 Swagelok Bulkhead
- PT: G1/4 Male Flat Long
- P14: M8 x 1 Male
- P18: M10 x 1 Male
- P22: 7/16-20 UNF male 74° Ext Cone
- P33: 7/16 UNF Female
- P60: M12 x 1.5 Int. Cone
- P61: G1/4 Female with Wire Lock
- RA: 1/4 VCR Female
- RC: G1/4 Male Flat Cross Bore
- RF: 1/4 VCR Male
- RQ: NW16 Flange
- RZ: 1/4-28 UNF LH THD 58° Cone

Pressure connection dimensions are detailed in document "ADROIT6200 Pressure Connectors" available on Druck.com.

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)	IP65/67**	Outdoor	-55 °C	As compensated temperature*
M12x1 Male (4 pin Type A coded)	IP65/67**	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.

**Note: IP65 for temperature range -20 °C to +80 °C and IP67 for temperature range -55 °C to +125 °C.

Connections

Electrical Connection	Option Code	Connections	4-20 mA	Voltage Output
Polyurethane Cable	1	Red	+ve Supply	+ve Supply
		Yellow	-	+ve Output
		Blue	-	-
		White	-ve Supply	0V Common
		Orange	-	-
		Black	-	-
		Cable Screen	Case	Case
Raychem Cable	2	Red	+ve Supply	+ve Supply
		White	-	+ve Output
		Green	-	-
		Blue	-ve Supply	0V Common
		Black	-	-
		Cable Screen	Case	Case
MIL-C-26482	6	A	+ve Supply	+ve Supply
		B	-ve Supply	+ve Output
		C	-	-
		D	-ve Supply	0V Common
		E	-	-
		F	-	-
Micro-DIN (9.4 mm pitch)	D	1	+ve Supply	+ve Supply
		2	-ve Supply	0V Common
		3	-	+ve Output
		E	Case	Case
MIL-C-26482 Alt Wiring	E	A	-	+ve Supply
		B	-	0V Common
		C	-	+ve Output
		D	-	0V Common
		E	-	-
		F	-	-
M12x1 Male 4-pin	G	1	+ve Supply	+ve Supply
		2	-	+ve Output
		3	-ve Supply	0V Common
		4	-	-
M12x1 Male 4-pin Alt Wiring	W	1	+ve Supply	+ve Supply
		2	-ve Supply	0V Common
		3	-	-
		4	-	+ve Output

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**

E MIL-C-26482 Bayonet alternative wiring **Note 1**

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

W M12x1 Male 4-Pin alternative wiring **Note 1**

Electronics Option

2 4 to 20 mA

4 0 to 5 Volts 3-wire

5 Configurable Voltage 3-wire

R 20 to 4 mA

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

PE 1/4 NPT Female

PF 1/4 NPT Male

PG 1/8 NPT Male

PJ M14 x 1.5 60° Int Cone

PK M12 x 1 Int Cone

PS 1/4 Swagelok Bulkhead **Note 7**

PT G1/4 Male Flat Long

P14 M8 X 1 Male **Note 7**

P18 M10 X 1 Male

P22 7/16-20 UNF Male 74° Ext Cone

P33 7/16-20 UNF Female

P60 M12 x 1.5 Int. Cone **Note 7**

P61 G1/4 Female with Wire Lock **Note 5 Note 7**

RA 1/4 VCR Female **Note 7**

RC G1/4 Male Flat Cross Bore **Note 5**

RF 1/4 VCR Male **Note 7**

RQ NW16 Flange **Note 6 Note 7**

RZ 1/4-28 UNF LH THD 58° Cone **Note 5 Note 7**

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: TD compensated range is only available for connector options 2, 6, G or W.

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

Note 5: This connection is only available on pressure ranges between ≥10 bar and ≤350 bar.

Note 6: This connection is only available on pressure ranges up to <10 bar.

Note 7: 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 Note 8

Unit options are:

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

Note 8: For ranges greater than 10 bar the zero offset needs to be less than 50% of the span.

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 (10 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 adjustments 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. 2 sets are required for 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
	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)

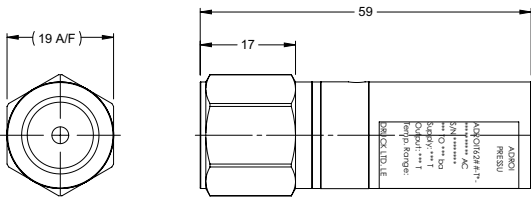
(2) State Cable length and units (Integer value only)

Minimum length 1 m (3 ft)

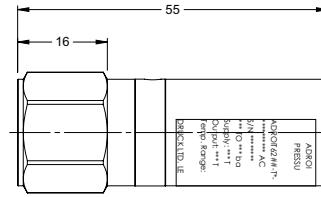
Maximum length 200 m (600 ft)

Example: UNIKCABLE-6-2 5 m

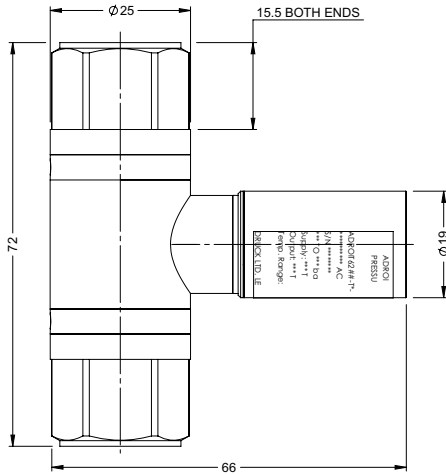
Mechanical Drawings



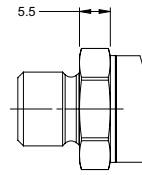
LOW PRESSURE CONSTRUCTION
(PRESSURE RANGES: <10 bar)



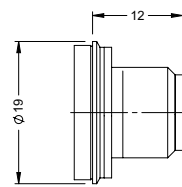
MEDIUM PRESSURE CONSTRUCTION
(PRESSURE RANGES: ≥10 bar to ≤350 bar)



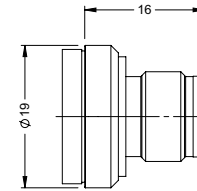
WET/WET & WET/DRY
DIFFERENTIAL
CONSTRUCTION



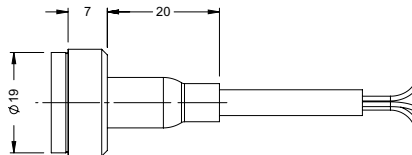
MALE PRESSURE CONNECTION



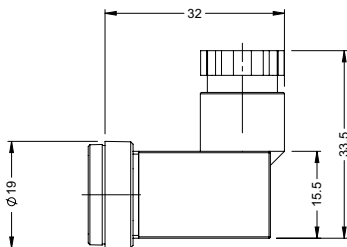
HIGH TEMP (TD) M12x1 4-PIN



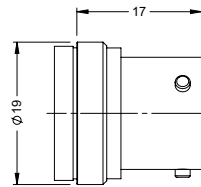
STANDARD TEMP (TB) M12x1 4-PIN



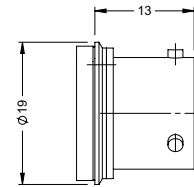
POLYURETHANE/RAYCHEM CABLE



MICRO DIN (9.4 mm PITCH)



STANDARD TEMP (TB)
MIL-C-26482 BAYONET



HIGH TEMP (TD)
MIL-C-26482 BAYONET

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