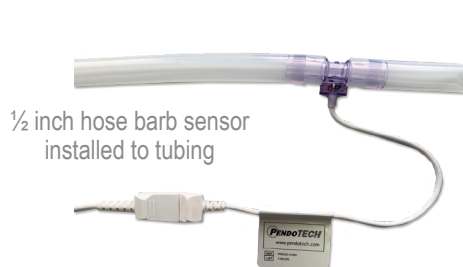# PendoTECH® Single Use Pressure Sensors™

PendoTECH Single Use Pressure Sensors measure static and dynamic pressure of gases and liquids in your processes accurately and cost effectively. They are perfect for filtration and chromatography processes, monitoring of glass and disposable bioreactors, filling operations and more. They feature the PendoTECH High Accuracy Pressure (MEMS-HAP™) chips inside. The sensors connect to monitors via an integral connector. Suitable monitors include PendoTECH PressureMAT® monitor/transmitter, a PendoTECH Process Control System, or other pre-qualified third party monitors. They can be non-invasively tested in-place with the PendoTECH PressureCHECKER™. They are the alternative low-cost solution for use with tubing to the existing stainless steel pressure transducers on the market.

- Available in 1/8 to 1 inch hose-barb connections, sanitary flange & luer connections
- May be repeatedly cleaned and re-used
- Operating range from -11.5 to 75 psi (-0.79 to 5.2 bar)
- Accuracy claim from -10 to 60 psi (-0.69 to 4.14 bar)
- Unobstructed flow path & no dead legs provide dramatically reduced hold-up volume versus stainless steel transducers or gauges
- 100% tested for critcal quality attributes during manufacturing
- Available in polycarbonate or caustic resistant polysulfone materials of construction
- All fluid path materials meet USP Class VI requirements both pre & post irradiation
- Certificate of Quality included with lot certification; individual NIST Certificates are optional
- Manufactured in a ISO 9001 certified facility; ISO Class 7 clean room
- Compatible with gamma irradiation and X-ray irradiation
- May be non-invasively tested in-place via test port

Hose Barb & Sanitary Flange Sensors

The hose-barb sensors securely adapt to process tubing. Their design imparts no obstruction on the fluid path that can cause a pressure drop and there is no dead-leg at the point where the pressure is measured. The hose-barb design features no mold parting-line where the tubing is secured, which can be a source of leaks. The single barb design provides space for the hose to relax behind the barb, causing the tie-wrap to work like a drawstring. Anti-rotation ribs lock the tubing, preventing it from loosening from a twisting motion. The sanitary flange sensors come in a variety of sizes and meet the ASME standard. The hybrid flange to barb sensors create a convenient transition from tubing to devices with sanitary flanges such as filters. They may even eliminate the need for costly adaptors and clamps.

½ inch hose barb sensor installed to tubing

½ inch flange to barb sensor

1 inch flange/flange sensor

- Fluid path view
- No dead-legs
- No obstructions

Luer Sensors

The luer sensors have male/female luer lock inlet/outlet ports and come with a cap on the female luer port for dead-end applications. With the universal luer fitting, they can be adapted to processes in different manners. The polycarbonate version is available sterile which is convenient for certain processes. They can be aseptically connected to a bioreactor to monitor vessel pressure. Testing has indicated that accurate process pressure readings are obtained in tee configurations. They can also be connected directly to the vent port on some filters.
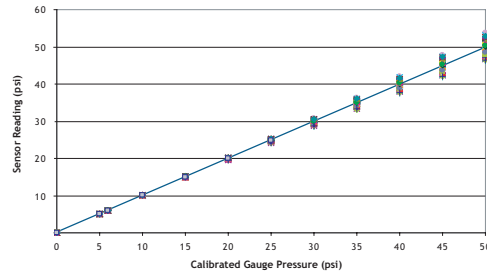
Luer Sensor

Pressure Sensors With Water-tight IP-67 Connector

All sensors available with water-tight panel-mount connector (versus standard molded connector) for OEM applications. The standard molded connector is IP67 when connected to reusable cable.

PendoTECH Pressure Sensor Data as Measured with a PendoTECH Process Control System (Data from 100 Sensors)

Data from 100 random sensors manufactured with the PendoTECH High Accuracy Pressure chips (MEMS-HAP).

Connector Detail:	PIN	SIGNAL
BINDER Series 620 part number 99 9209 00 04	1	Excit +
With degree of protection IP67	2	Sig -
	3	Sig +
	4	Excit -

Custom adaptor cables that connect the sensors to monitors/pumps with RJ12 phone cable inputs are available.

For more information see our tech note: http://www.pendotech.com/products/disposable_pressure_sensors/PendoTECH® Single Use Pressure Sensors with Ingress-Protection (IP) Rated 67 Connectors.pdf
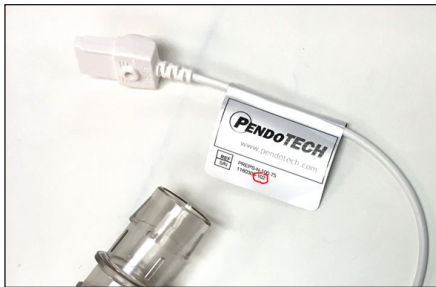
Detail	Specifications
Manufacturing Testing	100% of sensors are tested for critical quality attributes. - Each sensor is leak tested on the liquid side to confirm integral assembly - Sensors with a test port are leak tested on the test port side to confirm proper atmospheric reference - Each sensor is tested electrically to confirm proper electrical performance - Each sensor is tested to be accurate at 60 psi (4.14 bar) within +/-5% of reading (+/-3.0 psi/0.21bar)
Accuracy	*(see tables below)*
Pressure range	-11.5 to 75psi (-0.79 to 5.2bar)
Biocompatibility	All materials in contact with product fluid path meet USP Class VI requirements, both pre and post irradiation
Regulatory and Compliance Testing	• USP Class VI • USP 661 • ISO 10993-5 • Bioburden • ADCF • REACH Compliant • Particulates • Endotoxin • Bacteriostatis and Fungistatis (B&F) • RoHs Compliant
Manufacturing Environment	ISO 9001 certified facility; Class 7 clean room
Gamma Irradiation	Up to 50 kiloGrays
X-ray Irradiation	Up to 50 kiloGrays
Operating temperature	2°C to 40°C (other ranges with process qualification)
Storage temperature	-25°C to 65°C
Input/Output impedence	270 Ohms to 400 Ohms
Excitation voltage	2.5 to 10 volts DC (for best long term stability, use a lower excitation voltage)
Sensor Output	0.2584 mV/Volt/psi
Connector	Rating: IP67 when connected to reusable cable
Shelf life	5 years
Packaging	White Tyvek® and clear pouch with easy-open chevron seal; box of 25 sensors in polyethylene bags (except sterile sensors are not in polybags)

Accuracy tables:

Postive Range	Specification
0 to 6psi	±2% of reading
6 to 30psi	±3% of reading
30 to 60psi	±5% of reading

Vaccum Range	Specification
0 to -7psi	±3% of reading
-7 to -10psi	±5% of reading

PENDOTECH®
Adding Value To Your Process

Serialized Sensors with Individual NIST Certificates

Depending on the implementation of the sensors and end-users preferences, documented values of a sensor reading across a range of applied pressures may be desired. As a product option, select part numbers are available with a serial number in addition to the lot number along with a NIST Certificate report for each sensor with the NIST traceable reference used. Part numbers listed with suffix identifiers (-B, -30, or -60) added to the part number include individual NIST Certificates. While every sensor undergoes the standard acceptance test to meet lot requirements, these serialized sensors have additional testing and documentation of the actual readings at each applied pressure. The applied pressures and readings on the NIST certificate are based on the range of testing required.

Available NIST Cert products (part # suffix):

– B is for low pressure applications such as a bioreactor and the certificate is in the range of 0 to 6psi
  Values on NIST Certificate (in psi): 0, 1, 2, 3, 4, 5, 6, 0

– 30 is for moderate pressure applications in the range of 0 to 30psi
  Values on NIST Certificate (in psi): 0, 5, 10, 15, 20, 25, 30, 0

– 60 is for higher pressure applications where the PressureMAT products are used and the certificate
  is in the range of 0 to 60psi. Values on NIST Certificate (in psi): 0, 10, 20, 30, 40, 50, 60, 0

Sensor label shown with serial number highlighted

^ The PressureMAT monitor products (both monitors and transmitter model PT-60) interprets the non-linear range of the sensor millivolt output in the range from 30 to 60psi; the PressureMAT monitor will read the sensors to 75psi. Third party monitors typically only read the linear range up to 30psi.

PMAT-EXT-12F: Pressure Sensor
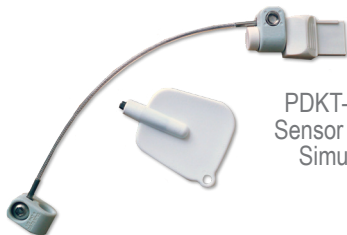Extension Cable (12ft)

Adaptor tee with luer port
PDKT-103-03, PDKT-104-03
& PDKT-105-03

PressureMAT and PDKT-650-950: PressureChecker
Pressure Sensor and Monitor Verification Tool, psi

PDKT-650-298CVR: Pressure
Sensor Cable Dust Cover / Zero
Simulator for PressureMAT

PDKT-V3PS-000: Polysulfone
3-way Stopcock

Panel Mount Recepticle for Sensors
PDKT-650-298BH: Bulkhead Connector

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LUER ORDERING INFO

PRESS-S-000	Single Use Pressure Sensor, polycarbonate, with luer - Sterile
PREPS-N-000	Single Use Pressure Sensor, polysulfone, with luer - Non-sterile
PDKT-103-03	1/4inch x 1/4inch (0.64 x 0.64cm) polycarbonate adaptor tee with luer port
PDKT-104-03	3/8inch x 3/8inch (0.95 x 0.95cm) polycarbonate adaptor tee with luer port
PDKT-105-03	1/2inch x 1/2inch (1.28 x 1.28cm) polycarbonate adaptor tee with luer port
PDKT-V3PS-000	Polysulfone 3-way stopcock with M/F luer inlet /outlet F branch

REUSABLE CABLE

PDKT-650-298	Cable Adapter for PendoTECH Single Use Pressure Sensor (12 feet)
PDKT-650-298-24	Cable Adapter for PendoTECH Single Use Pressure Sensor (24 feet)
PDKT-650-298M2	Cable Adapter to Minim 2 for Single Use Pressure Sensor (1ft/0.3M)
PDKT-650-298MG	Cable Adapter with RJ12 phone connector to Midgee Monitor for Single Use Pressure Sensor (6ft/2M)
PDKT-650-298MN	Cable Adapter with RJ12 phone connector to Pall Minim for Single Use Pressure Sensor (6ft/2M)

TEST CABLE

PMAT-TCA	Test cable assembly for PressureMAT accuracy check (allows millivolt signal input to similate sensor input)

NIST CERTIFICATE (Add suffix to end of part #)
MIN ORDER QTY: 25

-B	Single Use Pressure Sensor with 0-6psi NIST certificate
-30	Single Use Pressure Sensor with 0-30psi NIST certificate
-60	Single Use Pressure Sensor with 0-60psi NIST certificate

HOSE BARB & SANITARY FLANGE (ALL NON-STERILE) ORDERING INFO

POLYSULFONE

PREPS-N-	012	1/8 inch HB
	025	1/4 inch HB
	038	3/8 inch HB
	050	1/2 inch HB
	075	3/4 inch HB
	100	1 inch HB
	5-5	1/2 inch sanitary flange
	1-1	1 inch sanitary flange
	15-15	1 1/2 inch sanitary flange
	1-100	1 inch SF to 1 inch HB
	5-038	1/2 inch SF to 3/8 inch HB
	5-050	1/2 inch SF to 1/2 inch HB

POLYCARBONATE

PRESS-N-	025	1/4 inch HB
	038	3/8 inch HB
	050	1/2 inch HB
	075	3/4 inch HB
	100	1 inch HB

Ordering Information for Serialized Sensors with Individual NIST Certificates

• Sensors (except PRESS-S-000) are available with the individual serial numbers and individual NIST Certificates in addition to the lot certification. Depending on the testing range required, the suffix -B or -30 or -60 is added to the part number. Sample part #: PRESS-N-050-B (for sensor with the 0-6psi calibration cert) Contact PendoTECH for more information on this service or review the following Technical Note:
https://www.pendotech.com/wp-content/uploads/2021/01/Technical_Note-Accuracy_and_Implementation_of_PendoTECH_Pressure_Sensors.pdf

Pressure Sensors With Water-tight IP-67 Connector

• All sensors available with IP67 connector BINDER part # 99 9209 00 04. Add -W suffix to part number; minimum order quantity is 100. Sample part #: PREPS-N-050-W (sensor with IP67 connector)

NOTICE: NOT FOR ABOVE 75 PSIG (5.2 BAR). Each prospective user must test the sensor for its proposed application to determine its suitability for the purpose intended prior to incorporating the sensor into any process or application. The sensor is not designed, intended or authorized for use as components in life support or medical devices. Product is not designed for any application in which the failure of the product could result in personal injury, death or property damage. For warranty see www.pendotech.com/warranty.