PENDOTECH
Adding Value To Your Process

PendoTECH® Single Use Pressure Sensors™ for Use in Flexible BioProcess Containers

- Easily installs onto a flexible bioprocess container
- Measures pressure in the container
- Accurate performance in either liquid or gas applications
- No calibration required
- Low cost for single use applications
- Qualified for use up to 15psi (1.03bar)
- Precision better than ±0.003psi (0.2mbar) with PressureMAT® High Resolution Monitor

Applications Include:

- Safety: Preventing disposable bioreactor and storage bag over-pressurization
- Performance: Disposable bioreactor monitoring
- Leak Testing: For disposable bag pre-use integrity testing^
- Volume Measurement: Measuring liquid level by hydrostatic pressure (Pascal's Principle)^

Port Plate Details:

- Port plate with sensor receptacle seals to the film during the manufacturing process of the container
- Made of polyethylene specifically for port plate use
- Compatible with gamma irradiation
- NaOH resistant
- Meets USP Class VI

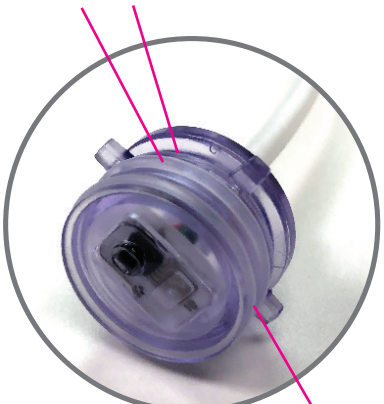
Sensor Details:

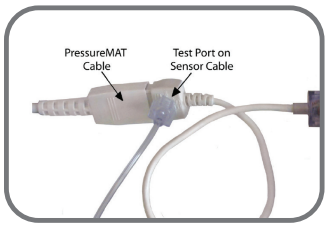
- 100% tested for accuracy and leaks during manufacturing
- Available in polycarbonate or caustic resistant polysulfone material of construction
- All materials meet USP Class VI requirements
- Certificate of quality included with lot certification; individual NIST Calibration Certificates are optional
- Manufactured in an ISO Class 7 clean room
- Compatible with gamma irradiation
- May be non-invasively tested in-place via test port

Product Details:

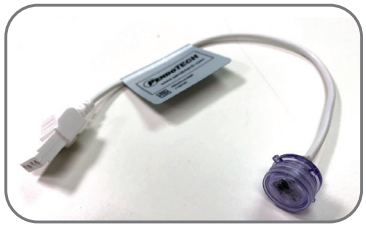
- After manufacture of the container, the sensor is inserted into the port plate receptacle.
- Locking collar holds sensor securely in place
- Features a double o-ring seal & a stop to ensure the sensor is fully inserted

Final Assembly of Sensor and Port Plate



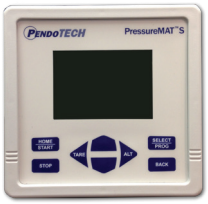


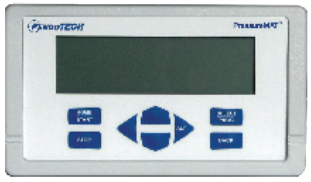
Sensor Test Port



^ Link to article: PendoTECH Single Use Pressure Sensors: Calibration, Accuracy, and Implementation

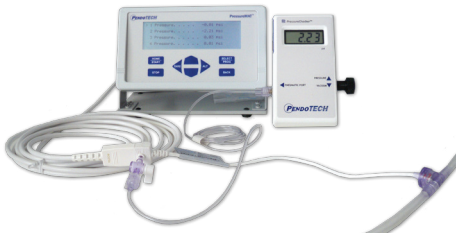
Selection of Monitors to Read Sensors





PressureMAT® Monitor, Alarm & Transmitter

PressureMAT®
Sensor Transmitter



PendoTECH PressureChecker™
Non-invasive Sensor Verification Tool

Installation Example

Sensor connects to monitor for reading

Tote with container installed with sensor cable lead exiting through hole in bottom of tote

Zoom view of sensor affixed to port plate at bottom of container

https://www.pendotech.com/wp-content/uploads/2020/08/Application-Note-Measuring-the-Liquid-Volume-in-a-Bioprocess-Container.pdf

Sensor Specifications:

<table>
<tr><th>Detail</th><th>Specifications</th></tr>
<tr><td>Manufacturing Testing</td><td>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)</td></tr>
<tr><td>Accuracy</td><td>
<table>
<tr><th>Postive Range</th><th>Specification</th></tr>
<tr><td>0 to 6psi</td><td>±2% of reading</td></tr>
<tr><td>6 to 30psi</td><td>±3% of reading</td></tr>
<tr><td>30 to 60psi</td><td>±5% of reading</td></tr>
</table>
<table>
<tr><th>Vaccum Range</th><th>Specification</th></tr>
<tr><td>0 to -7psi</td><td>±3% of reading</td></tr>
<tr><td>-7 to -10psi</td><td>±5% of reading</td></tr>
</table>
</td></tr>
<tr><td>Pressure range</td><td>For full assembly: up to 15psi
For insert only: 75psi</td></tr>
<tr><td>Biocompatibility</td><td>All materials in contact with product fluid path meet USP Class VI requirements, both pre and post irradiation</td></tr>
<tr><td>Manufacturing Environment</td><td>ISO 9001 certified facility; Class 7 clean room</td></tr>
<tr><td>Gamma Irradiation</td><td>Up to 50 kiloGrays</td></tr>
<tr><td>X-ray Irradiation</td><td>Up to 50 kiloGrays</td></tr>
<tr><td>Operating temperature</td><td>2°C to 40°C (other ranges with process qualification)</td></tr>
<tr><td>Storage temperature</td><td>-25°C to 65°C</td></tr>
<tr><td>Input/Output impedence</td><td>270 Ohms to 400 Ohms</td></tr>
<tr><td>Excitation voltage</td><td>2.5 to 10 volts DC (for best long term stability, use a lower excitation voltage)</td></tr>
<tr><td>Sensor Output</td><td>0.2584 mV/Volt/psi</td></tr>
<tr><td>Connector</td><td>Rating: IP67 when connected to reusable cable</td></tr>
<tr><td>Shelf life</td><td>5 years</td></tr>
<tr><td>Packaging</td><td>White Tyvek® and clear pouch with easy-open chevron seal; box of 25 sensors in polyethylene bags</td></tr>
</table>

Ordering Information

PTPL-PRESS	Single Use Pressure Sensor Insert for Port Plate, Polycarbonate
PTPL-PREPS	Single Use Pressure Sensor Insert for Port Plate, Polysulfone
PORT-D1-HDPE	Port Plate for Sensor Inserts, 2.25”D, Material: HDPE DOW DMDA-8007 HEALTH+. Pack of 25
PORT-RING	Pack of 25 locking rings for PORT-D1-HDPE bagged in polyethylene bag
PDKT-650-950	PressureChecker pressure sensor and monitor verification tool, psi
Sensors with NIST calibration certificates, see primary pressure sensor datasheet for further details	
PTPL-PREPS-B	Single Use Pressure Sensor Insert for Port Plate, non-sterile, Polysulfone, with 0-6 psi NIST certificate
PTPL-PRESS-B	Single Use Pressure Sensor Insert for Port Plate, non-sterile, Polycarbonate, with 0-6 psi NIST certificate
PTPL-PREPS-W	Single Use Pressure Sensor Insert for Port Plate, non-sterile, Polysulfone with IP67 Connector

Covered by Pat. 10,215,598; Pat. 10,041,896; Pat. EP 14867894.9; and Pat. Pending
For warranty information see our website at http://www.pendotech.com/warranty