

## PendoTECH® Single Use Temperature Sensors™

PendoTECH® Single Use Temperature Sensors™ measure temperature in your processes accurately and cost effectively. They are low cost for single use applications where elimination of cross-contamination is required yet robust enough and to be repeatedly cleaned and re-used. They are designed for in-line use and perfect for filtration and chromatography processes, filling operations, and general process monitoring. These sensors connect to monitors via a re-usable cable. Suitable monitors include the handheld unit TEMP-340, a PendoTECH Process Control System, or other pre-qualified third party monitors. Also, a stand-alone transmitter is available with a 4 to 20mA analog output. They are the alternative solution for use with tubing to the existing temperature measurements devices on the market.

### Sensor Features

To optimally adapt to tubing the sensors are available with either a hose-barb fitting, a 1inch sanitary flange, or a luer fitting. The hose-barb and flange sensor designs imparts no obstruction on the fluid path that can cause a pressure drop. There is no dead-leg at the point where the temperature is measured. The luer fitting can be connected to a variety of fittings that can securely adapt to tubing or other devices. The temperature sensing element is a thermistor. No calibration is required because the temperature versus resistance for the thermistor element is well-defined within the specified accuracy range. Within the electrical instrument, the measured resistance is converted to the temperature. A disposable dip probe is also available to measure temperature within a vessel.

### Connection to Monitors

The hose-barb and flange sensors and dip probe connect to the monitor via a 10ft (3.0m) long re-usable cable. One end has a molded connector to connect to the sensor connector and the other end has a 1/4inch headphone plug commonly used by many commercially available monitors. The luer sensor has a custom molded connector on the 7ft (2.1m) long re-usable monitor cable that is quickly secured to the temperature sensor. There is an alignment guide on the sensor that prevents it from being connected improperly. Disconnection of the cable connector from the sensors is quick and easy and the monitor indicates the sensor has been disconnected.



Barb & Flange Sensors



- Available in a variety of sizes to adapt to different processes - a variety of hose-barb fittings, a 1inch sanitary flange and a luer fitting
- Compatible with gamma & x-ray irradiation
- High sensitivity to temperature change
- Better than +/- 0.2°C accuracy (typ. better than 0.1°C) in the specified range of 0-70°C
- Polysulfone material of construction for hose-barb and flange sensors; polycarbonate material for luer
- NO calibration required, each is tested during manufacturing to be within specification
- All fluid path materials for flange and hose-barb sensors meet USP Class VI requirements\*
- Certificate of quality included
- Manufactured in a FDA Registered, ISO 9001 certified facility



*Luer sensor shown connected to different size fittings for adaptation to different processes. The center picture shows the connection to the monitor cable.*

\* Luer sensors for research purposes only and not designed for use in manufacturing processes. Polycarbonate connector for luer sensors that may contact a fluid path is not tested for USP Class VI. Dip probe not tested for USP Class VI; stainless steel not applicable.

## TEMP-340 - Handheld Monitor



It has a rugged design with a large backlit display, a built-in stand, and optional AC adapter. It features a sealed control panel, Min/Max /hold function, °C/°F and low battery indicator. The TEMP-340 can manually store or automatically log up to 2000 sets of readings that are time-stamped. The data can be downloaded to a PC via USB.

### Thermistor Resistance Data for PendoTECH Single Use Temperature Sensors\*

Temp °C	Resistance Ω	Temp °C	Resistance Ω	Temp °C	Resistance Ω	Temp °C	Resistance Ω
0	7355	18	3081	36	1412	54	697.9
1	6989	19	2944	37	1355	55	672.5
2	6644	20	2814	38	1301	56	648.1
3	6319	21	2690	39	1249	57	624.8
4	6011	22	2572	40	1200	58	602.4
5	5719	23	2460	41	1152	59	580.9
6	5444	24	2354	42	1107	60	560.3
7	5183	25	2252	43	1064	61	540.5
8	4937	26	2156	44	1023	62	521.5
9	4703	27	2064	45	983.8	63	503.3
10	4482	28	1977	46	946.2	64	485.8
11	4273	29	1894	47	910.2	65	469.0
12	4074	30	1815	48	875.8	66	452.9
13	3886	31	1739	49	842.8	67	437.4
14	3708	32	1667	50	811.3	68	422.5
15	3539	33	1599	51	781.1	69	408.2
16	3378	34	1533	52	752.2	70	394.5
17	3226	35	1471	53	724.5	71	381.2

\*PendoTECH Transmitter available to convert temperature to a linear 4-20mA signal

Detail	Specifications
Manufacturing Testing	<ul style="list-style-type: none"> <li>- Product is Animal Derived Component Free</li> <li>- Each thermistor is tested at 10°C to confirm 4482Ω ± 0.2°C</li> <li>- Each thermistor is tested at 25°C to confirm 2252Ω ± 0.2°C</li> <li>- Each thermistor is tested at 40°C to confirm 1200Ω ± 0.2°C</li> <li>- Each product is tested to confirm 500VDC isolation minimum between thermistor assembly and stainless steel tube</li> <li>- Each product is tested at room temperature to ensure proper assembly and electrical continuity</li> <li>- Each product is leak-tested to confirm integral assembly</li> </ul>
Accuracy	Hose-barb and flange sensors: Better than +/- 0.2°C (typical better than 0.1°C) Luer: Better than +/- 0.4°C (typical better than 0.2°C)
Temperature range	0 to 70°C
Biocompatibility	Hose-barb and flange sensors: all polymeric materials in contact with product fluid path meet USP Class VI requirements*
Regulatory and Compliance Testing	<ul style="list-style-type: none"> <li>• USP Class VI</li> <li>• Endotoxin</li> <li>• ISO 10993-5</li> <li>• REACH Compliant</li> <li>• ADCF</li> <li>• RoHS Compliant</li> <li>• Particulates</li> <li>• Bacteriostatis and Fungistatis (B&amp;F)</li> <li>• Bioburden</li> </ul>
Manufacturing environment	ISO 9001 certified facility; Class 5
Gamma irradiation	Up to 50 kiloGrays <sup>^</sup>
X-ray irradiation	Up to 50 kiloGrays
Resistance@25°C	2252ohm
Connector	Custom molded 2 contact connector (different versions for luer and hose-barb versions)
Pressure range	Up to 75psi (5.2bar)
Shelf life	5 years
Monitor Cable	Hose-barb: 10ft (3.0m) with 1/4inch headphone plug to connect to monitor receptacle Luer: 7ft (2.1m) with 1/4inch headphone plug to connect to the monitor receptacle
Storage Temp	-25°C to 65°C
Packaging	Heat sealed, individually packaged in polybag

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<sup>^</sup> At this gamma dose there is a shift in the accuracy in the range of 0 to 2°C to +/- 0.5°C and in the range of 50 to 70°C to +/- 0.5°C.



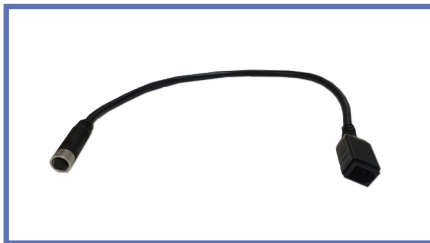
PendoTECH Temperature Sensor Transmitter



PendoTECH Temperature Transmitter



Monitor Cable for Hose-barb Sensor and Dip Probe



PDKT-TEMPB-PNL

### Temperature Sensor Panel Mount Connector

As customized systems with single use sensors become more common, PendoTECH has developed an ideal solution to connect a PendoTECH Single Use Temperature Sensor to a control panel. The sensor has an overmolded connector on it that helps minimize the sensor cost. The panel mount cable has the receptacle for the sensor on one end and an industry standard panel mount connector on the other end. This enables it to connect to the panel and allows the panel receptacle to be wired directly to the PendoTECH Temperature Sensor Transmitter inside the panel and an extension added if needed.

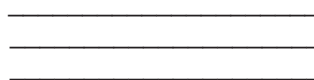
#### WIRING DIAGRAM

**M8**

3

1 (BROWN)

4 (BLACK)



**PINS**

NC

PIN 1

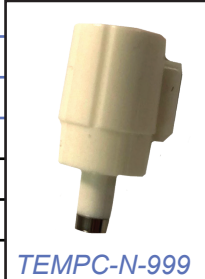
PIN 2



PIN 1

# Ordering Information

Ordering Information	Description
TEMPS-N-012	Single use temperature sensor, non-sterile, polysulfone, stainless steel sensor, 1/8inch hose-barb
TEMPS-N-025	Single use temperature sensor, non-sterile, polysulfone, stainless steel sensor, 1/4inch hose-barb
TEMPS-N-038	Single use temperature sensor, non-sterile, polysulfone, stainless steel sensor, 3/8inch hose-barb
TEMPS-N-050	Single use temperature sensor, non-sterile, polysulfone, stainless steel sensor, 1/2inch hose-barb
TEMPS-N-075	Single use temperature sensor, non-sterile, polysulfone, stainless steel sensor, 3/4inch hose-barb
TEMPS-N-1-1	Single use temperature sensor, non-sterile, polysulfone, 1inch sanitary flange
TEMPC-N-999	Single use temperature sensor with luer fitting
<b>Accessories for sensors:</b>	
PDKT-650-TEMPB	3.0m re-usable temperature sensor cable with 1/4 phone jack term. for hose-barb sensors
PDKT-650-TEMPL	7ft re-usable temperature sensor cable with 1/4 phone jack term. for luer sensors
PDKT-TEMPB-PNL	PendoTECH 12inch re-usable temperature sensor cable with M8 termination for hose-barb sensors
TM-TEMP-340	PendoTECH Temperature sensor monitor for 1 sensor with built-in data logger and RS-232 data output
TT1	PendoTECH Temperature Sensor Transmitter
TT1-DR	PendoTECH Temperature Sensor Transmitter DIN Rail Mounting Kit
PDKT-TT1	PendoTECH Temperature Sensor Benchtop Transmitter with 4-20mA output in ABS plastic box with 24VDC wall supply (for 1 sensor)
PDKT-TT2	PendoTECH Temperature Sensor Benchtop Transmitter with 4-20mA output in ABS plastic box with 24VDC wall supply (for 2 sensors)
PDKT-TT4	PendoTECH Temperature Sensor Benchtop Transmitter with 4-20mA output in ABS plastic box with 24VDC wall supply (for 4 sensors)
PDKT-TT1-PMAT	Cable from PDKT-TT1 temperature transmitter to PressureMAT analog input, 6ft (2m)
PDKT-TT2-PMAT	Cable from PDKT-TT2 temperature transmitter to PressureMAT analog input (2x), 6ft (2m)
PMAT-DAQ	Analog display with 4 inputs with alarm inputs and serial port for data collection
PMAT-DAQ-A	Analog display with 4 inputs, 4 analog outputs, alarms, and serial port for data collection
PDKT-TT4-PDAQ	Cable from PDKT-TT4 to PMAT-DAQ, 4 analog signals, 4ft (1.2m)
PDKT-103-03	1/4inch x 1/4inch (0.64 x 0.64cm) polycarbonate straight connector with luer port
PDKT-104-03	3/8inch x 3/8inch (0.95 x 0.95cm) polycarbonate straight connector with luer port
PDKT-105-03	1/2inch x 1/2inch (1.27 x 1.27cm) polycarbonate straight connector with luer port
PDKT-000-03	Male x female x female luer tee, polycarbonate
PDKT-000-04	Male x female x female luer tee, polypropylene



NOTICE: NOT FOR USE ABOVE 75PSIG (5.2BAR). 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](http://www.pendotech.com/warranty). ADCF Status: Hose-barb sensors compliant with EMA 410 Rev 3 Guidelines