

# PT-1000

## Temperature Probe

Reads	<b>Temperature</b>
Range	<b>-200°C to 850°C</b>
Probe type	<b>Class A platinum, RTD</b>
Accuracy	<b>+/- (0.15 + (0.002*t))</b>
Reaction Time	<b>90% in 13s</b>
Cable length	<b>81cm</b>
Output	<b>Analog</b>
Time before recalibration	<b>3–5 years</b>
Life expectancy	<b>15 years</b>
Maintenance	<b>N/A</b>



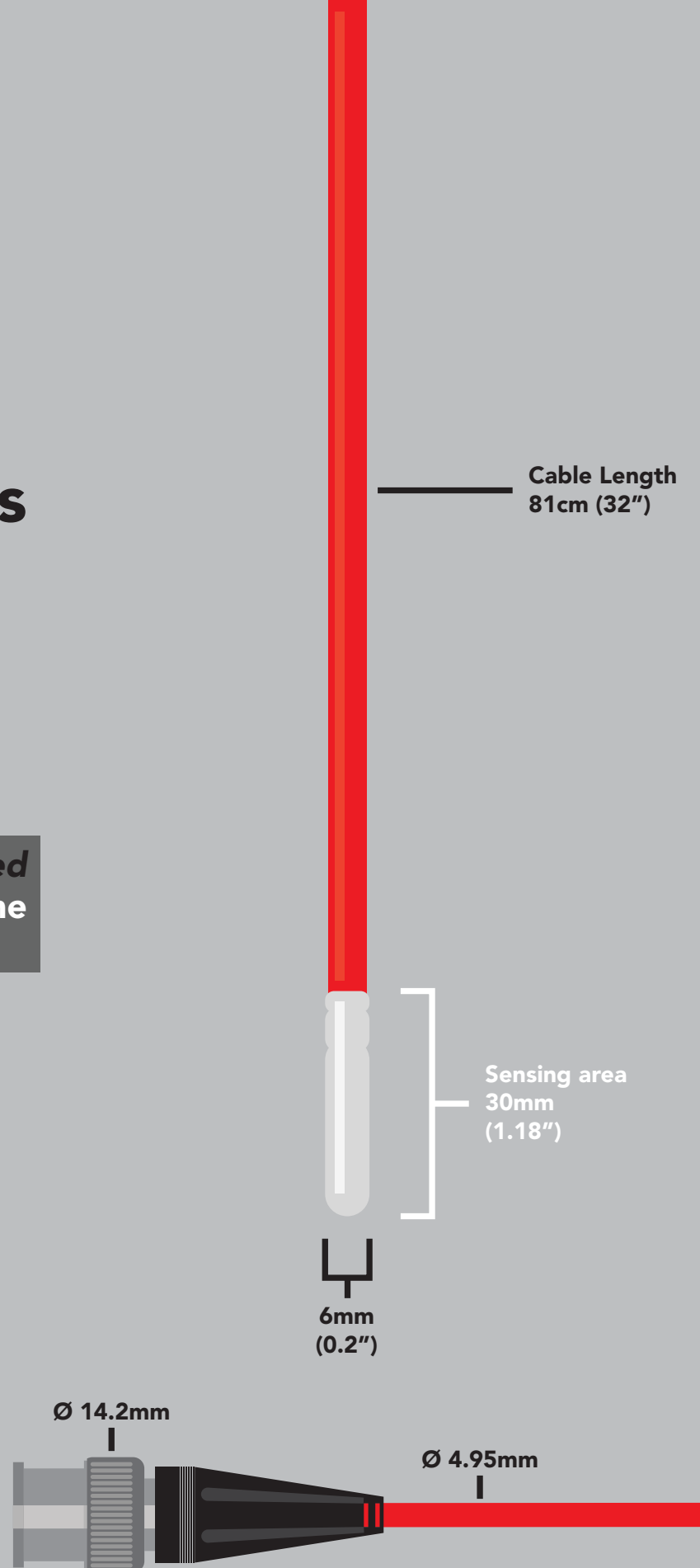
# Specifications

Cable length	<b>81cm (32")</b>
Weight	<b>40 grams</b>
Min cable temp	<b>-55°C</b>
Max cable temp	<b>125°C</b>
Sensing material	<b>304 SS</b>
Dimensions	<b>6mm x 81cm (0.2" x 32")</b>
BNC connector	<b>Yes</b>
Sterilization	<b>Chemical / Autoclave</b>

# Typical Applications

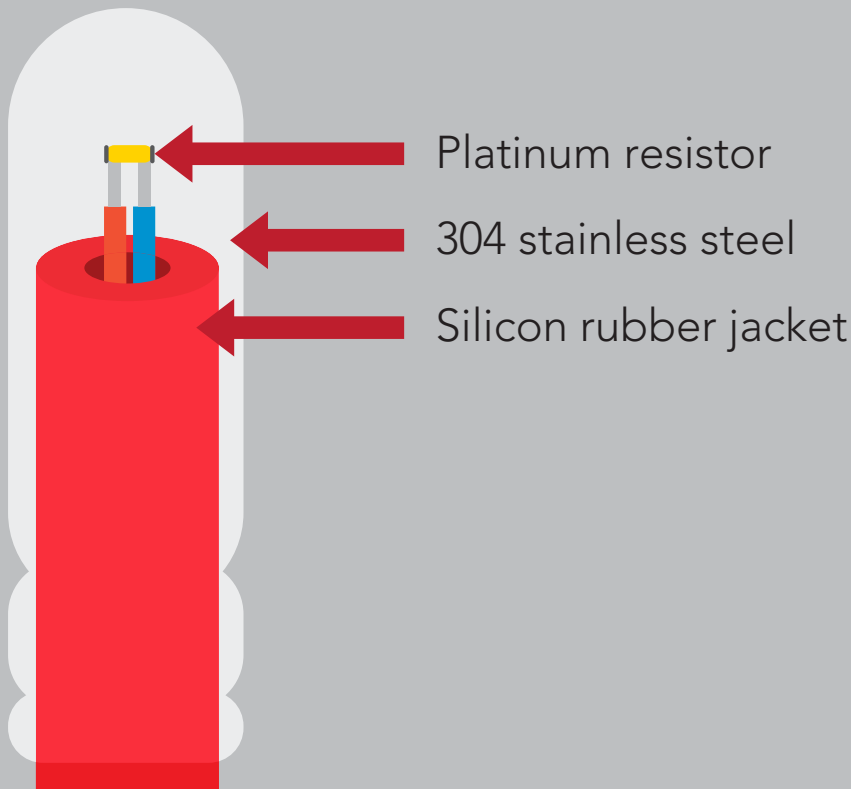
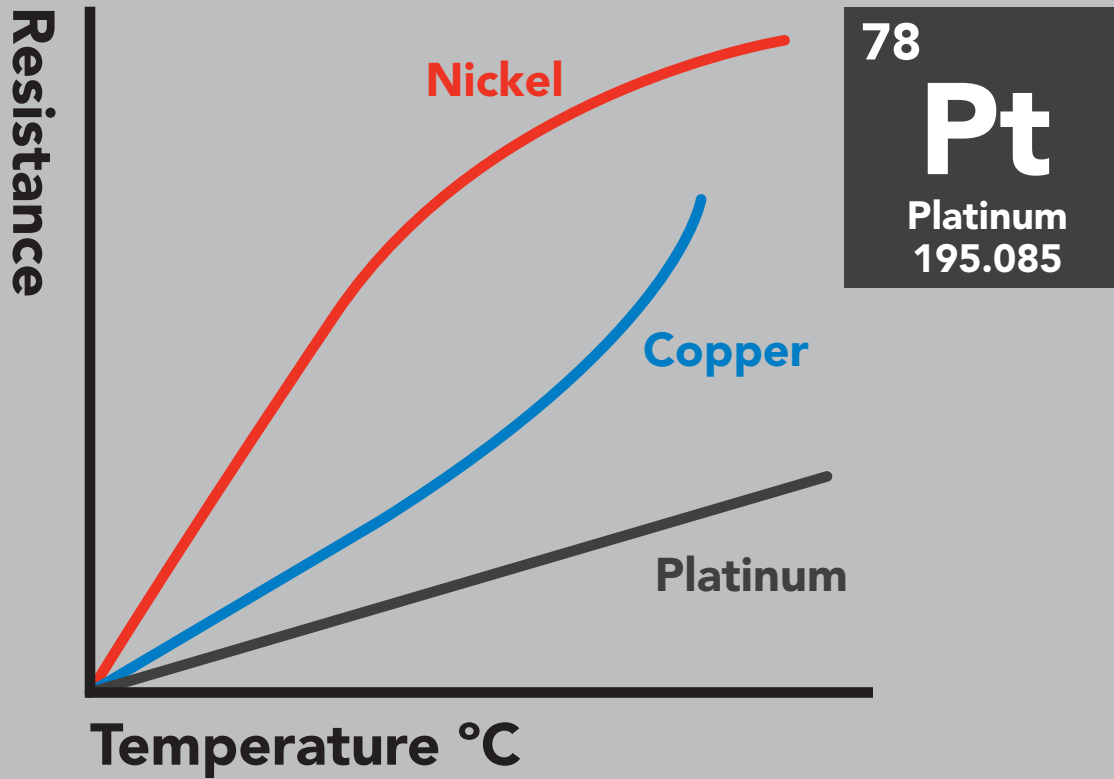
- Standard lab use
- Field use
- Soil
- Hydroponics / aquaponics
- Beer, wine and other liquor
- Food safe

The PT-1000 can be *fully submerged* in fresh water or salt water, up to the BNC connector *indefinitely*.

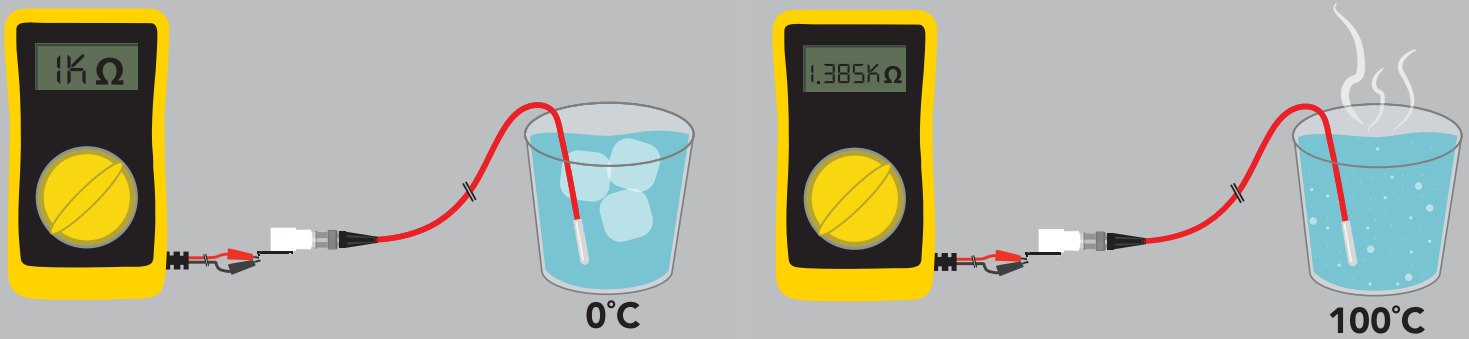


# Operating principle

Unlike any other material, platinum's correlation between resistance and temperature seems to be woven into the fabric of the universe. It is for this reason, that the platinum RTD temperature sensor is the industrial standard for temperature measurement.



The PT-1000 temperature probe is a resistance type thermometer. Where PT stands for platinum and 1000 is the measured resistance of the probe at 0°C in ohms (1k at 0°C). As the temperature changes the resistance of the platinum changes.



To convert the resistance of the probe to temperature, use the following simplified equation:

$$T = \frac{-\sqrt{(-0.00232(R) + 17.59246)} - 3.908}{0.00116}$$

**T** = Degrees Celsius

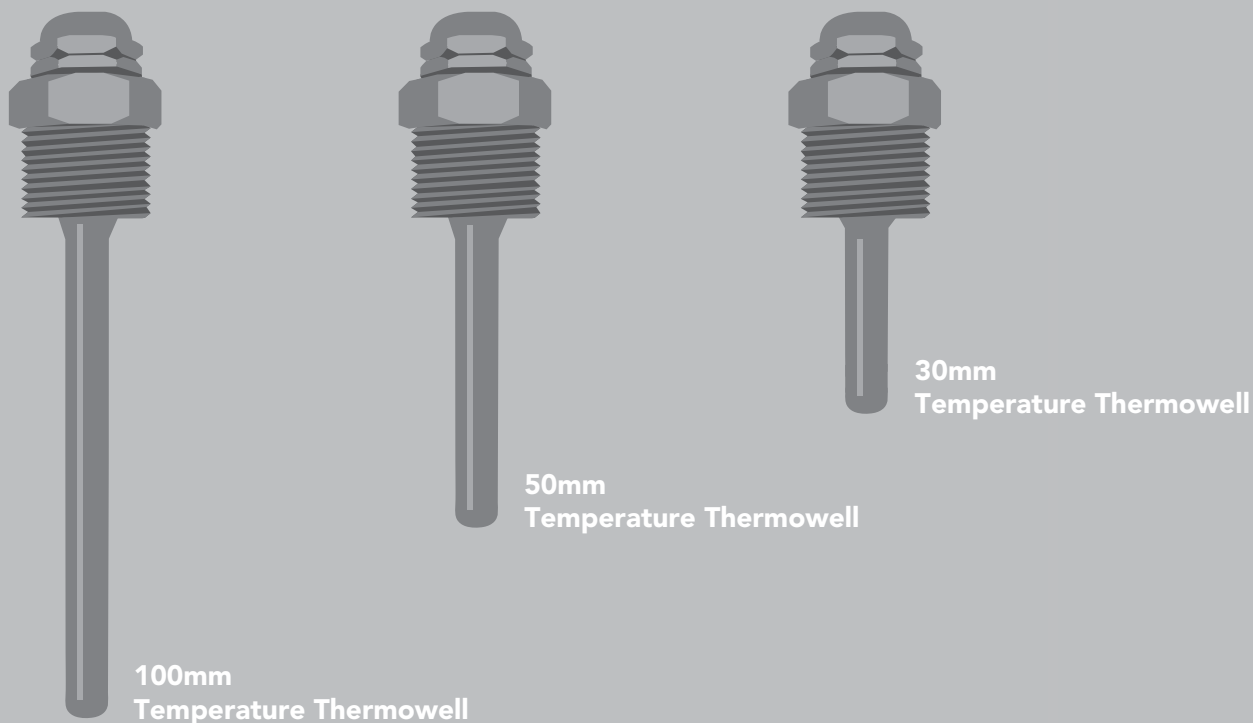
**R** = Resistance measured from PT-1000 temperature probe

Below is a small table of temperatures and resistances, to help insure the above equation has been properly embedded into your code.

°C	Ω	°C	Ω	°C	Ω
-10	= 960.9	7	= 1027.3	24	= 1093.5
-9	= 964.8	8	= 1031.2	25	= 1097.3
-8	= 968.7	9	= 1035.1	26	= 1101.2
-7	= 972.6	10	= 1039	27	= 1105.1
-6	= 976.5	11	= 1042.9	28	= 1109
-5	= 980.4	12	= 1046.8	29	= 1112.8
-4	= 984.4	13	= 1050.7	30	= 1116.7
-3	= 988.3	14	= 1054.6	31	= 1120.6
-2	= 992.2	15	= 1058.5	32	= 1124.5
-1	= 996.1	16	= 1062.4	33	= 1128.3
0	= 1000	17	= 1066.3	34	= 1132.2
1	= 1003.9	18	= 1070.2	35	= 1136.1
2	= 1007.8	19	= 1074	36	= 1139.9
3	= 1011.7	20	= 1077.9	37	= 1143.8
4	= 1015.6	21	= 1081.8	38	= 1147.7
5	= 1019.5	22	= 1085.7	39	= 1151.5
6	= 1023.4	23	= 1089.6	40	= 1155.4

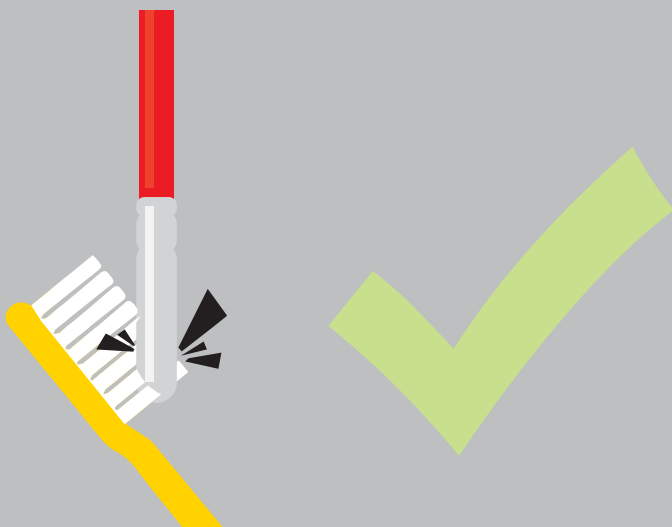
# Extended temperature range

In order to read temperatures that are above or below the max cable temperature (-55°C to 125°C) additional probe housing or **thermowells**, are needed to protect the cable from any temperature related damage.



# Probe cleaning

Over time PT-1000 probes can become dirty and covered in deposits. Both soft and hard coatings can be removed by lightly brushing around the sensing area.

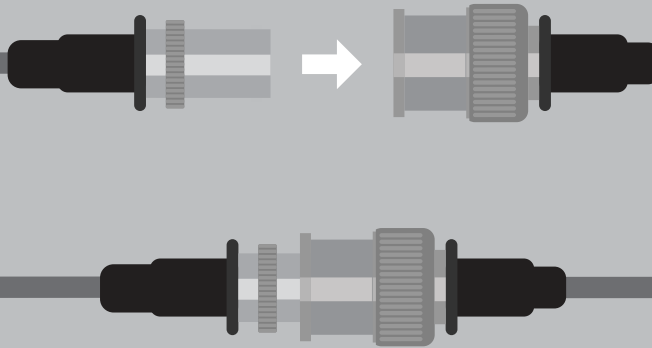


# Extending the probe cable length

You can extend the cable to greater than 100 meters with no loss of signal. Atlas Scientific has tested up to 300 meters without a problem, however you run the risk of turning your PT-1000 into an antennae, picking up noise along the length of your cable.

If you want to extend your cable, we recommend that you use proper isolation, such as the **Basic EZO™ Inline Voltage Isolator**, or **Tentacle Shield**. Be sure to calibrate your probe with the extended cable.

Extending a probe cable can be easily done with our **BNC Extension Cable**. Simply connect the BNC end of the probe to the Extension cable, and you are all set.



If you need to water proof a BNC connection, we highly recommend using a product like **Coax-Seal** to safely cover and prevent any water damage that may occur.



**Water proof**