FLUKE®
Calibration

5606
Full Immersion PRTs

for laboratory freezers,
autoclaves, and furnaces

Technical Data

- 5606: -200 °C to 160 °C
- Calibration accuracy of ± 0.05 °C
- Transition junction and lead wires can withstand full PRT temperature range
- Unique probe seal of 5606 prevents ingress of moisture
- Calibration not included; NVLAP-accredited calibration optional

The 5606 Full Immersion PRTs are designed to perform in extreme environments where both the transition junction and the lead wires are required to withstand temperatures covering the entire operating range of the probe. ("Immersion" in this case simply means exposure to temperatures other than ambient and does not necessarily refer to the medium to which the PRT and its components are subjected.)

Applications where "full immersion" of probe, transition junction, and lead wire is required can include calibration or validation of sensors used in laboratory or bio freezers, walk-in refrigerators, autoclaves, ovens, stability test chambers, furnaces or incubators. Other applications might include IQ/OQ/PQ qualification procedures, temperature mapping, or data logging in temperature controlled spaces or environmental chambers.

The 5606 is just two inches (50 mm) in length with a sheath diameter of 1/8 inch (3.1 mm). Since it can be fully immersed over its entire temperature range, you don't have to worry about calculating minimum immersion depth—immerse the entire probe, transition junction, and lead wires, in either non-corrosive liquids or dry mediums ranging from –200 °C to 160 °C. The 100 Ω precision sensing element (alpha = 0.00385) is specially constructed to prevent the ingress of moisture while achieving calibration accuracies as good as ± 0.05 °C. You get both accuracy and flexibility built into a small, durable package.

The lead wires of the 5606 are made of single-conductor enameled copper wire which prevents moisture from wicking to the sensing element as it would if a more common, stranded lead wire were used. The diameter of the lead wire is no greater than 0.2 mm, making it easy to run lead wires through a freezer door to your readout or transmitter with effectively zero energy loss. The 5606 has been proven in common heat transfer fluids such as silicone oil, mineral oil, ethanol, and even liquid nitrogen with no degradation of the transition junction seal or lead wire insulation.

If you need longer lead wire than the standard length, call one of our Application Specialists today for a free quote. They can also help you determine which readout and probe termination are best suited for your application or help you select the right calibration for your probe.

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Specifications

Specifications	5606
Temperature range	-200 °C to 160 °C
Nominal resistance at 0.01 °C	100 Ω ± 0.1 Ω
Temperature coefficient	0.00385 Ω/Ω/°C
Accuracy[1]	± 0.04 °C at 0.01 °C ± 0.06 °C at 160 °C
Short-term repeatability[2]	± 0.03 °C at 0.01 °C ± 0.04 °C at 160 °C
Drift[3]	± 0.03 °C at 0.01 °C ± 0.04 °C at 160 °C
Hysteresis	± 0.015 °C
Sheath length	50 mm ± 5 mm (2 in ± 0.2 in)
Sheath diameter	3.1 mm ± 0.1 mm (1/8 in ± 0.004 in)
Sheath material	316 SST
Transition junction temperature range[4]	-200 °C to 160 °C
Transition junction dimensions	No transition
Sensor length	30 mm ± 3mm (1.2 in ±0.1 in)
Sensor location	3 mm ± 1 mm from tip (1.2 in ± 0.04 in)
Minimum insulation resistance	20 MΩ at 23 °C
Minimum immersion length	Full immersion
Maximum immersion depth in liquid medium	Full immersion
Maximum immersion depth in dry medium	Full immersion
Response time[5]	12 seconds typical
Self heating (in 0 °C bath)	± 0.003 °C
Lead-wire cable type	Enameled copper wire
Lead-wire length	2.4 meters (8 ft)
Lead-wire temperature range	160 °C
Calibration	Calibration not included. NVLAP accredited calibration available. See ordering information.

[1] Includes calibration and 100 hr drift (k = 2).
[2] Three thermal cycles from min to max temp, includes hysteresis, 95 % confidence (k = 2).
[3] After 100 hours at max temp, 95 % confidence (k = 2).
[4] Temperatures outside this range will cause irreparable damage.
[5] Per ASTM E 644.

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Calibration uncertainty

	5606	
Temperature	**1924 Calibration Uncertainty†**	**Tolerance w/out Calibration‡**
-197 °C	0.03 °C	0.4 °C
-38 °C	0.03 °C	0.2 °C
0 °C	0.03 °C	0.1 °C
100 °C	0.045 °C	0.3 °C
157 °C	0.05 °C	0.4 °C

† Lab code 200348-0
‡ Each PRT includes a certificate with a measured R0 value.

An uncalibrated 5606 meets ASTM E 1137 Grade A Classification of Tolerances. Use the coefficients below to achieve the tolerances listed in the "No Calibration" column or calculate the Grade A tolerance using the following formula: Grade A = ± [0.13 + 0.0017|t|]°C where: |t| = value of temperature (°C) without regard to sign. See ASTM E 1137.

R0: Enter the R0 value provided
A: 3.9083×10^{-3}
B: -5.775×10^{-7}
C: -4.183×10^{-4}

Ordering information

5606-50-X†	Probe, Immersion PRT, 50 mm, –200 to 160 °C
1924-4-10	PRT Calibration, –200 to 157 °C, NVLAP-accredited‡
1924-5-10	PRT Calibration, -40 to 157 °C, NVLAP-accredited‡
1924-P	PRT Calibration, 0 to 450 °C, NVLAP-accredited‡
1930-4-10	System Calibration by Comparison, -200 to 157 °C, NVLAP-accredited‡
1930-5-10	System Calibration by Comparison, -40 to 157 °C, NVLAP-accredited‡
1930-P	System Calibration by Comparison, 0 to 450 °C, NVLAP-accredited‡
2603	Small Probe Carrying Case

† X = termination. Specify "A" (INFO-CON for 914X), "B" (bare wire), "D" (5-pin DIN for Tweener Thermometers), "G" (gold pins), "I" (INFO-CON for 1521 or 1522), "J" (banana plugs), "L" (mini spade lugs), "M" (mini banana plugs), "P" (INFO-CON for 1523 or 1524), or "S" (spade lugs).

‡ Lab code 200348-0

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