

Secondary PRT with calibration options

Technical Data



- 5608: -200 °C to 500 °C (80 mm minimum immersion)
- 5609: -200 °C to 670 °C (100 mm minimum immersion)
- ± 0.01 short-term stability
- Calibration not included, NVLAP-accredited calibration optional, lab code 200348-0

If you want a very stable thermometer from -200 °C to 670 °C and are particular about the calibration, then look no further than our 5609 Secondary Reference PRT. Its short-term stability at the triple point of water is only ± 10 mK and its one-quarter inch (6.23 mm) diameter lets you get accurate measurements in only 100 mm of immersion. The 5608 is also a ± 10 mK probe at the triple point of water, but its one-eighth inch (3.18 mm) diameter gets you accurate measurements from -200 °C to 500 °C with only 80 mm (3.1 in) of immersion. With multiple sheath length options on both of these probes, you can find the dimensions that are just right for your specific application.

The 5608 comes with a one-eighth inch (3.18 mm) diameter sheath in lengths of 9 inches or 12 inches. The 5609 comes with a one-quarter inch (6.35 mm) diameter sheath in lengths of

12 inches, 15 inches, and 20 inches; or with a 6 mm diameter in lengths of 300 mm, 400 mm, or 500 mm.

When looking for improved response time and reduced stem effect in shallow immersion, look for small diameter probes, because the measurement error called stem effect is caused by the diameter of the stem rather than the length of the stem.

Both of these probes have Inconel™ sheaths and are made using a special manufacturing process, giving them great precision over a wide temperature range. The sensors for these probes are reference-grade platinum and feature four-wire connections with less noisy measurements than two-wire counterparts.

These probes come with a certificate of compliance to ensure they meet their specifications. If you'd like, you can also order a NVLAP-accredited calibration from our laboratory, lab

code 200348-0. On the report of calibration, you'll get the test data and the ITS-90 calibration coefficients that you can easily input into any Hart thermometer. If you order your probe with an INFO-CON connector, we'll program the coefficients directly into your connector, which loads the coefficients for you when you plug it into our 1522 Hand-held Thermometer.

Call today for your free quote.

Specifications	
Temperature range	5608: -200 °C to 500 °C 5609: -200 °C to 670 °C
Nominal resistance at 0.01 °C	100 Ω ± 0.5 Ω
Temperature coefficient	0.0039250 Ω/Ω/°C
Accuracy^[1]	See footnote
Short-term repeatability^[2]	± 0.01 °C at 0.010 °C ± 0.02 °C at max temp
Drift^[3]	± 0.01 °C at 0.010 °C ± 0.02 °C at max temp
Hysteresis	± 0.01 °C maximum
Sensor length	30 mm ± 5 mm (1.2 in ± 0.2 in)
Sensor location	3 mm ± 1 mm from tip (0.1 in ± 0.1 in)
Sheath material	Inconel™ 600
Minimum insulation resistance	5608: 500 MΩ at 23 °C, 20 MΩ at 500 °C 5609: 500 MΩ at 23 °C, 10 MΩ at 670 °C
Transition junction temperature range^[4]	-50 °C to 200 °C
Transition junction dimensions	71 mm x 12.5 mm (2.8 in x 0.49 in)
Minimum immersion length^[5] (<5 mK error)	5608: 80 mm (3.1 in) 5609: 100 mm (3.9 in)
Maximum immersion length	305 mm (12 in)
Response time^[5]	5608: 9 seconds typical 5609: 12 seconds typical
Self heating (in 0 °C bath)	5608: 75 mW/°C 5609: 50 mW/°C
Lead-wire cable type	Teflon,™ 24 AWG
Lead-wire length	1.8 m (6 ft)
Lead-wire temperature range	-50 °C to 250 °C
Calibration	Calibration not included; NVLAP-accredited calibration optional, lab code 200348-0. Please see calibration uncertainty table and its explanation of changeable uncertainties.

^[1]"Accuracy" is a difficult term when used to describe a resistance thermometer. The simplest way to derive basic "accuracy" is to combine the probe drift specification and calibration uncertainty with readout accuracy at a given temperature.

^[2]Three thermal cycles from min to max temp, includes hysteresis, 99.9 % confidence

^[3]After 100 hours at max temp, 99.9 % confidence

^[4]Temperatures outside this range will cause irreparable damage. For best performance, transition junction should not be too hot to touch.

^[5]Per ASTM E 644

Calibration Uncertainty for optional NVLAP-accredited† calibration

Temperature	Expanded Uncertainty (k=2)
-200 °C	0.025 °C
-100 °C	0.025 °C
-40 °C	0.025 °C
0 °C	0.025 °C
156 °C	0.025 °C
230 °C	0.030 °C
420 °C	0.045 °C
660 °C	0.050 °C†

Note: Calibration uncertainties depend on the uncertainties of the lab performing the calibration. Subsequent calibrations of this probe performed with different processes, at different facilities, or with changed uncertainty statements may state different uncertainties.

†Lab code 200348-0

‡Not yet accredited

Ordering Information

- 5608-9-X** Secondary Reference PRT, 9 in x 1/8 in, -200 to 500 °C
- 5608-12-X** Secondary Reference PRT, 12 in x 1/8 in, -200 to 500 °C
- 5609-12-X** Secondary Reference PRT, 12 in x 1/4 in, -200 to 670 °C
- 5609-15-X** Secondary Reference PRT, 15 in x 1/4 in, -200 to 670 °C
- 5609-20-X** Secondary Reference PRT, 20 in x 1/4 in, -200 to 670 °C
- 5609-300-X** Secondary Reference PRT, 300 mm x 6 mm, -200 to 670 °C
- 5609-400-X** Secondary Reference PRT, 400 mm x 6 mm, -200 to 670 °C
- 5609-500-X** Secondary Reference PRT, 500 mm x 6 mm, -200 to 670 °C
- 1923** PRT (RTD) Calibration by Comparison, NVLAP Accredited
- 1930** Precision Digital Thermometer System Calibration by Comparison, NVLAP-accredited, lab code 200348-0
- 2601** Plastic PRT Case, for models ending -9, -12, and -300
- 2609** Plastic PRT Case, for models ending -15, -20, -400, and -500

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

Fluke. Keeping your world up and running.®

**Fluke Corporation
Hart Scientific Division**

799 E Utah Valley Drive
American Fork, UT 84003

Tel: 801.763.1600
Fax: 801.763.1010
E-Mail: info@hartscientific.com
www.hartscientific.com

**Fluke Europe B. V.,
Hart Scientific Division**

PO Box 1186, 5602 BD Eindhoven
The Netherlands

Tel: +31 (0)40 2675 403
Fax: +31 (0)40 2675 404
E-mail: Hart.Logistics@Fluke.NL

All other countries:
Tel: +1 801.763.1600
Fax: +1 801.763.1010