FLUKE®

Calibration

# 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
- Dry-well reference with 90 ° bend

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, and an optonal 90 ° bend at nine inches from the tip for dry-well applications, 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.

As standard, each probe includes its resistance value at the triple point of water. If calibration is desired, you can 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 Fluke Calibration 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 Handheld Thermometer.

Call today for your free quote.

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## Specifications

| | |
|---|---|
| **Temperature range** | **5608:** -200 °C to 500 °C<br>**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<br>± 0.02 °C at max temp |
| **Drift**[3] | ± 0.01 °C at 0.010 °C<br>± 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<br>**5609:** 500 MΩ at 23 °C, 10 MΩ at 670 °C |
| **Transition junction dimensions** | 71 mm x 12.5 mm (2.8 in x 0.49 in) |
| **Minimum immersion length**[4] **(<5 mK error)** | **5608:** 80 mm (3.1 in)<br>**5609:** 100 mm (3.9 in) |
| **Maximum immersion length** | 305 mm (12 in) |
| **Response time**[5] | **5608:** 9 seconds typical<br>**5609:** 12 seconds typical |
| **Self heating (in 0 °C bath)** | **5608:** 75 mW/°C<br>**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]Per ASTM E 644

### Calibration uncertainty for optional calibrations

| | 1922 | 1923 | 1924 |
|---|---|---|---|
| -197 °C | 0.010 °C | 0.025 °C | 0.025 °C |
| -38 °C | 0.009 °C | 0.025 °C | 0.025 °C |
| 0 °C | 0.009 °C | 0.025 °C | 0.025 °C |
| 157 °C | 0.014 °C | 0.030 °C | 0.045 °C |
| 232 °C | 0.016 °C | 0.030 °C | 0.045 °C |
| 420 °C | 0.025 °C† | 0.035 °C | 0.045 °C |
| 660 °C | n/a | 0.050 °C | 0.050 °C |

**Note:** Uncertainties depend on lab practices, available information and equipment. A selection of calibrations are available to meet customer needs. 1930 calibrations are for complete thermometer systems. 1923 and 1924 calibrations are for PRTs only. As of 2008, model 1923 and 1930 calibrations are accredited. 1924 calibrations have not yet been accredited. Lab code 200348-0.

†1922-4-R uncertainties are ± 0.025 °C at 500 °C.

## 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
**5609-9BND** Secondary Reference PRT, 15 in x 1/4 in, 9 in bend, -200 °C to 670 °C, (optional calibration: 1924-4-7 only)
**1922-4-R** PRT Calibration, -200 °C to 500 °C, NVLAP Accredited
**1923-4-7** PRT Calibration, -200 °C to 660 °C, NVLAP Accredited
**1924-4-7** PRT Calibration, -200 °C to 660 °C, NIST-traceable
**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).*

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