TECHNICAL DATA

5616 | Secondary Reference PRT

Product overview: 5616 | Secondary Reference PRT

The temperature range of the 5616 covers –200 °C to 420 °C, and its high-purity platinum element and durability make it great for calibrating in the lab or in the field. When choosing a reference with a platinum element, there are two things you want to look at carefully: the short-term repeatability and the long-term drift. When PRTs are thermally cycled over their temperature range as they would be during a calibration, their resistance at the triple point of water can move up and down within an expected range. Fluke Calibration defines this range (called “short-term repeatability) as the repeatability at the triple point of water during three thermal cycles. 5616s are among the best performing in their class with short-term repeatability better than ± 0.010 °C (± 0.004 °C is typical). In addition, the 5616’s drift is ± 0.007 °C at the triple point of water when exposed up to its maximum temperature (420 °C) for 100 hours. These specifications are given at k=2 and therefore include a 95 % confidence level.

The 5616’s sealed ¬INCONEL® 600 sheath is 298 mm (11.75 in) long and 6.35 mm (0.250 in) in diameter. The probe’s PTFE-jacketed cable is made of silver plated copper that ends with four-wire leads, which eliminate the effects of lead-wire resistance on measurements. Use the 5616 with Fluke Calibration’s 1523 Handheld Reference Thermometer, 1524 Handheld Reference Thermometer, 1560 Black Stack, 1529 Chub-E4, or 1502A Tweener thermometer readouts.

Each sensor comes with a manufacturer’s report of calibration. The report includes the expanded uncertainty (k=2) at seven calibration temperature points, ITS-90 calibration coefficients, and a temperature vs. resistance table presented in 1 °C increments. Compare the 5616 to other Secondary Reference PRTs. You’ll like its price, but you’ll love its performance.

Specifications: 5616 | Secondary Reference PRT

Specifications	
Parameter	Value
Temperature range	−200 °C to 420 °C
Nominal resistance at 0.01 °C	100 Ω ± 0.5 Ω
Temperature coefficient	0.003925 Ω/Ω/°C nominal
Calibrated Accuracy[1] (k=2)	± 0.012 °C at −200 °C ± 0.011 °C at 0 °C ± 0.028 °C at 420 °C
Short-term repeatability[2]	± 0.007 °C at 0.010 °C
Drift[3]	± 0.007 °C at 0.010 °C
Hysteresis	± 0.010 °C maximum
Sensor length	50.8 mm (2.0 in)
Sensor location	9.5 mm ± 3.2 mm from tip (0.375 in ± 0.125 in)
Sheath diameter tolerance	± 0.08 mm (± 0.003 in)
Sheath material	INCONEL® 600
Minimum insulation resistance	500 MΩ at 23 °C
Transition junction temperature range[4]	−50 °C to 150 °C (see footnote)
Minimum immersion length[5] (< 5 mK error)	102 mm (4.0 in)
Maximum immersion length	254 mm (10 in)
Response time[5]	8 seconds typical
Self heating (in 0 °C bath)	60 mΩ/°C
Lead-wire cable type	PTFE-jacketed cable, PTFE insulated conductors, 24 AWG stranded, silver plated copper
Lead-wire length	182.9 cm ± 2.5 cm (72.0 in ± 1.0 in)
Lead-wire temperature range	−50 °C to 150 °C
Calibration	NIST-traceable calibration

[1]Includes calibration uncertainty and 100 hr drift. [2]Three thermal cycles from min to max temp, includes hysteresis, 95 % confidence (k=2) [3]After 100 hrs at max temp, 95 % confidence (k=2) [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 Temperature Expanded Uncertainty (k=2) −197 °C 0.012 °C −80 °C 0.012 °C −38 °C 0.011 °C 0 °C 0.009 °C 156 °C 0.011 °C 230 °C 0.013 °C 420 °C 0.021 °C Note: Laboratories may periodically reevaluate their uncertainties. Calibration uncertainties depend on the calibration process, the standards used, and the instrument performance.

Ordering information

5616-12-X

Secondary Reference PRT, 6.35 mm x 298 mm 0.250 x 11.75 in), –200 °C to 420 °C

(Calibration traceable to NIST standards included. Not RoHS compliant.)

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

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