

# Teflon-Coated Secondary Reference Thermistor Probe

## Technical Data

- Measure almost anywhere
- Chemical resistance to nearly everything
- Short-term accuracy to  $\pm 0.01$  °C; one-year drift  $< \pm 0.01$  °C
- Accredited NVLAP calibration optional



Hundreds of thousands of thermistors are sold every year, but only a few have the stability necessary for use as high-accuracy thermometry standards. If you're looking for lab-grade thermistor for accurate work across a narrow temp range at a reasonable price, Hart's Secondary Reference Series thermistor probes are the best you can buy.

### Teflon construction

The 5611T Teflon Probe's unique construction makes it an especially versatile thermistor. With a tip that is just 3 mm (0.120 in) in diameter and a Teflon coating that makes it impervious to most liquids, the Teflon Probe is handy for measuring in a wide variety of applications, including bio-pharmaceuticals. It's even immersible to nearly 6 meters (20 ft) and flexible enough that you could roll it up into a ball in your hand if you wanted to!

The 5611T's thermistor bead is encapsulated in a mylar sleeve that is encapsulated inside a Teflon sleeve. The Teflon sleeve is melted around the Teflon-insu-

lated cable, forming a moisture-proof seal.

### Higher performance

As with Hart's other secondary reference thermistors, our Teflon thermistor has a very small sensing element, so its self heating is minimized, making its measurements in air more accurate than those of a PRT. Its small size also allows measurements to be taken more quickly and without needing as much immersion as a PRT.

If your application involves frequent handling, you'll be especially interested to know thermistors are less susceptible to mechanical shock than PRTs. The bottom line may be better accuracy in fieldwork.

Additionally, higher base resistance and larger resistance coefficients make it easier to achieve precision readings with thermistors, so better resolution and accuracy are possible for a lower cost. This probe has a negative temperature coefficient (NTC) of resistance.

### Readouts

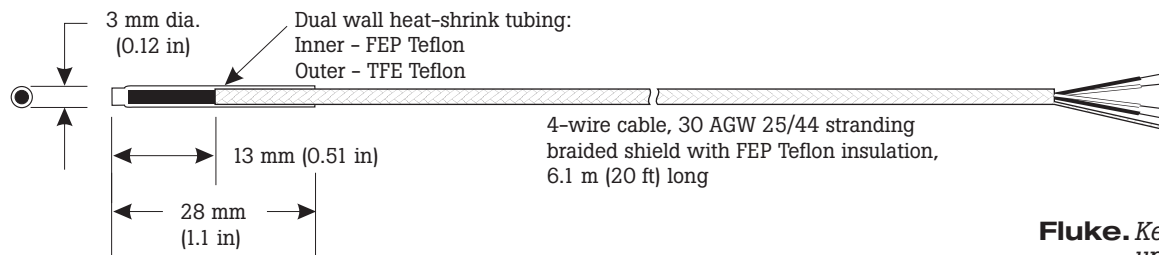
Several thermometer readout options are available for use with the 5611T: the 1504 Tweener, the 1521 and 1522 Little Lord Kelvin handheld thermometers, the 1529 Chub-E4, the 1560 *Black Stack*, and the 1575A and 1590 Super-Thermometers. The most accurate readings are obtained when coupled with the *Black Stack's* 2563 Standards Thermistor Module or 1590 Super-Thermometer, but if you want to measure up to four thermistors simultaneously you need the Chub-E4.

### Calibrated accuracy

What's more, this probe comes with a NIST-traceable calibration with  $k=2$  uncertainties of  $\pm 0.010$  °C. The expected difference between calibrations during a single year interval is expected to be less than 0.010 °C. A NVLAP accredited calibration as a single thermistor or as a system combined with its readout is also available.

## Specifications

Parameter	Value
Maximum temperature	100 °C
Minimum temperature	0 °C
Nominal resistance 25 °C	10,000 Ω ± 0.01
Temperature coefficient	Negative (NTC)
Length of sensor	13 mm (0.51 in)
Length of sheath	2.79 cm (1.10 in)
Diameter of sheath	3.0 mm (0.12 in)
Sheath material	Teflon
Immersible length of instrument	~ 6 m (20 ft)
Short term stability maximum temp (no less than three thermal cycles)	<6 mK
Long term stability maximum temp (no less than 100 hrs @ max temp)	<6 mK
Hysteresis (if different from short term stability)	<1 mK
Self heating (DC in 25°C bath)	4 mW/°C typical
Self heating (DC in room temperature air)	.014 mW/°C typical
Time constant (room temperature to 70°C bath)	4 seconds typical
Time constant (70°C bath to room temperature)	30 seconds typical
Susceptibility to vibration (lo med hi)	Low
Lead wire cable type	4 wire, 30 AWG, 25/44, clear FEP Teflon insulation
Lead wire outside diameter	1.75 mm (0.069 in)
Lead wire length	6.1 m (20 ft)
Standard calibration	NIST traceable calibration, R vs. T table with 0.1 °C increments, interpolation equation furnished
Calibration uncertainty	Table and equation are accurate to ± 0.01 °C
Optional calibration	Certificate of NVLAP-accredited calibration, Data supplied at 6 points over 100 °C span, complies with NCSL/ISO/IEC 17025:2000 and ANSI/NCSL Z540-1-1994
Termination	Specify when ordering



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**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 Eurpoe 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

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## Ordering Information

- 5611T-X** Teflon Probe
- 2601** Probe Carrying Case
- 1925-A** Calibration, 100 °C span, 6 points over span, NVLAP-accredited
- 1935-A** System calibration, 100 °C span, 6 points over span, NVLAP-accredited

*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).*