

-196 to 670°C

Reference Probes - Semi Standards Platinum Resistance Thermometers

- High Stability Reference Probes
- Wide Temperature Ranges
- High Stability Platinum Coil Elements

These industrial platinum resistance thermometers are ideal for field and lab use. Suitable for use as working standards in Dry Blocks and Liquid Baths or as high accuracy probes for our range of True Temperature Indicators.

All the thermometers are metal sheathed and both less fragile and more affordable than the Isotech range of true Standard Platinum Resistance Thermometers that are used in laboratories and are found in our publication "Solutions for Primary and Secondary Laboratories".

All the thermometers use handmade coil wound platinum sensing elements to give high accuracy and low drift. Isotech's UKAS accredited lab can calibrate to the smallest of uncertainties.

Calibration should be specified to suit the particular operating range and application. Isotech can advise on which service is appropriate to match the temperature range and application.

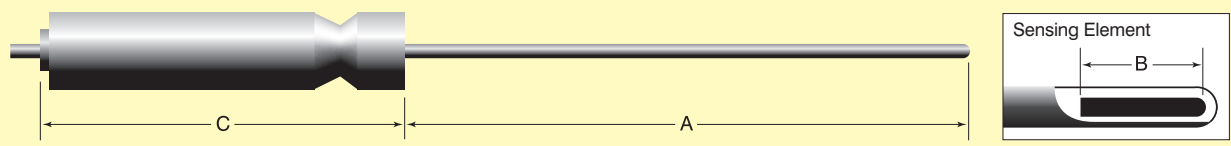
<http://www.isotech.co.uk>



Universal Specifications

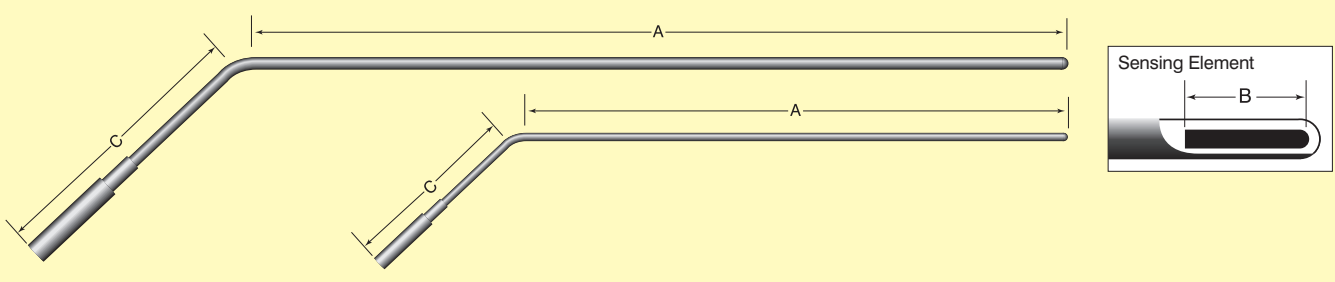
| | |
|-------------------------|---|
| Ro | 100Ω ± 0.05 Ω |
| Alpha | 0.003850 ± 0.000005 |
| Standard | IEC 60751 |
| Stability | 0.010 Ω/year |
| Recommended Current | 1mA |
| Self Heating at 1mA | 0.004°C |
| Calibration | Optional UKAS Calibration at extra cost. See table for typical uncertainties |
| Connection | Four Wire |
| Max. Handle Temperature | 80°C |

After manufacture all Isotech Semi Standard PRTs are thermally pre-conditioned to provide optimal stability.



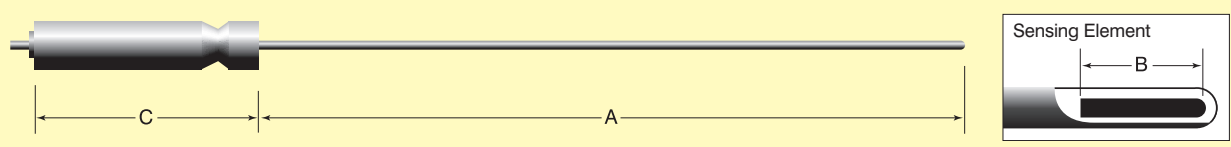
■ **General Purpose Probes**

| Model | Range | Diameter | Length (A) | Sensing Length (B) | Handle (C) | Cable | Application |
|------------|-----------------|----------|------------|--------------------|------------|---------|------------------------------------|
| 935-14-112 | -50°C to 250°C | 3mm | 225mm | 6mm | No Handle | 2m PTFE | General Purpose/TTI-10 |
| 935-14-61 | -50°C to 250°C | 4mm | 300mm | 6mm | 19 x 120mm | 2m PTFE | Fast Response, Low Stem Conduction |
| 935-14-13 | -196°C to 250°C | 6mm | 350mm | 25mm | 25 x 115mm | 2m PTFE | Low Temperature |
| 935-14-113 | -100°C to 250°C | 6mm | 350mm | 25mm | 19 x 120mm | 2m PTFE | General Purpose |
| 935-14-16 | -100°C to 450°C | 6mm | 450mm | 25mm | 19 x 120mm | 2m PTFE | General Purpose |
| 935-14-116 | -100°C to 450°C | 6mm | 350mm | 25mm | 19 x 120mm | 2m PTFE | General Purpose/Fits milliK Case |
| 935-14-72 | -50°C to 670°C | 6mm | 375mm | 25mm | No Handle | 2m PTFE | Fits Jupiter / Gemini Carry Case |
| 935-14-98 | -50°C to 350°C | 4mm | 300mm | 8mm | No Handle | 2m PTFE | Low Stem Conduction |



■ **Angled Probes** - angled head provides maximum clearance at top of calibration bath

| Model | Range | Diameter | Length (A) | Sensing Length (B) | (C) | Cable | Application |
|-----------|----------------|----------|------------|--------------------|------|-------------|--------------------------|
| 935-14-82 | -50°C to 250°C | 4mm | 210mm | 6mm | 50mm | 1.5m PTFE | Europa - Venus - Calisto |
| 935-14-85 | -50°C to 250°C | 6mm | 420mm | 25mm | 35mm | 0.54 m PTFE | Oceanus-6 |



■ **Working Industrial Standards**

These thermometers use premium grade wire wound elements to IEC-751 and the same internal construction as our working Standard SPRTs. The 95L is optimised for low temperature with minimum stem conduction. The 95H is optimised for high temperature operation. Both models employ strain free construction.

| Model | Range | Diameter | Length (A) | Sensing Length (B) | Handle (C) | Cable |
|------------|-----------------|----------|------------|--------------------|------------|---------|
| 935-14-95L | -200°C to 165°C | 6mm | 480mm | 25mm | 25 x 115mm | 2m PTFE |
| 935-14-95H | -80°C to 670°C | 6mm | 480mm | 25mm | 19 x 120mm | 2m PTFE |

Termination Options

- Bare Wire (BW)
- TTI suits milliK and TTI-1 to TTI-7, TTI-b – suits TTI-22
- DB Connector for Dry Block Calibrator Site Indicator

How to Order

Please Specify Model Type and Termination Option (for example 935-14-13/BW)
Please state whether UKAS Certification is required

Typical Uncertainties of PRT Semi Standards with Range

| Temperature | Uncertainty mK | | | | | |
|-------------|----------------|-------------|-------------------------|------------|---------------------------------------|--------------------------|
| | Model | 935-14-95L* | 935-14-61* 935-14-13 | 935-14-13* | 935-14-95H* 935-14-72 935-14-16 | 935-14-95H* 935-14-72 |
| -196 | | 25 | N/A | 25 | N/A | N/A |
| -80 | | 20 | N/A | 20 | 25 | 25 |
| -50 | | 15 | 15 | 15 | 20 | 20 |
| 0 | | 10 | 10 | 10 | 15 | 15 |
| 50 | | 10 | 10 | 10 | 15 | 15 |
| 156 | | 10 | 10 | 10 | 15 | 20 |
| 232 | | N/A | 15 | 15 | 20 | 25 |
| 420 | | N/A | N/A | N/A | 40 | 40 |
| 550 | | N/A | N/A | N/A | N/A | 50 |
| 660 | | N/A | N/A | N/A | N/A | 50 |

*Preferred Models

The above uncertainties do not include long term drift
 Typical Stability of correctly used semi standard is 0.01°C/year at 0°C
 Actual uncertainty of a probe determined at time of calibration

Isotech have generated a long history of many of our semi-standards.

Here are a few documented facts:

The 935-14-95 model has the widest temperature range and in consequence is likely to suffer the largest changes in characteristics.

Guy Snelling sent the following email about the 935-14-95.

ISOTECH

I thought that you might like to see the calibration history of one of our probes from the past 12 years.

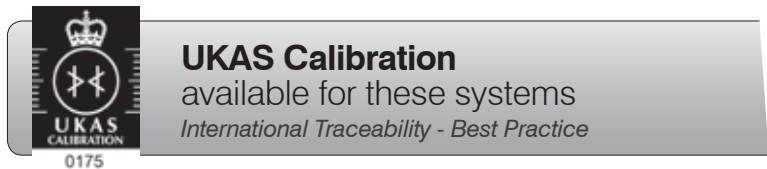
You may recall that we purchased this probe to use as a laboratory standard when our company was still young. This particular probe is still in daily use and is regularly taken to 600°C in our dry block calibrator. While we handle it with care, being in daily use for 12 year it has take the occasional mild knock and accidental abuse - I believe that it was even taken to close to 700°C once, although I wasn't involved so I can't testify to the temperature reached.

You'll see from the attached history of the calibration by our NMI that the probe has remained stable and accurate, and bearing in mind the daily variations in temperature that it has undergone, these results are testimony to the high quality of this product.

John, you are to be congratulated on developing and producing such a fine measuring instrument, and feel free to use us as a product reference any time.

Kind regards,

Guy Snelling
 Temperature Metrologist
 InterCal (South Africa)



Resistance at 0°C

