ISOTECH

Whitepaper

- High-Accuracy in Harsh Conditions
- Fully waterproof PRTs built for total submersion
- Inconel sheaths and sealed cable glands for durability
- 10m low-loss cables – robust and lab-accurate
- Custom probes exceed IEC 60751 tolerance
- Traceable calibration with uncertainty better than 15mK

Precision in Submersion

High-Accuracy Waterproof Platinum Resistance Thermometers for Use in a Temperature-Controlled Water Jacket

Custom Engineering for Challenging Conditions – Metrology in Industrial Settings

In the field of temperature metrology, some applications demand custom solutions rather than off-the-shelf products—requiring not only precision but also protection from harsh and unconventional environments. One recent project presented exactly that: the need for high-accuracy probes designed for full immersion in a temperature-controlled water jacket.

These weren't standard sensors. The application required long, durable, and fully waterproof probes capable of withstanding extended use in submerged conditions. Off-the-shelf solutions didn't offer the required accuracy. The task demanded a purpose-built metrology probe—reliable, rugged, and custom-tailored to a critical environment.





New Design for Semi-Standard PRTs

With extensive experience in probe manufacturing and calibration, our team worked closely with the client to develop a specification that could meet both performance and environmental requirements. Using Inconel sheathing for corrosion resistance, we engineered semi-standard platinum resistance thermometers with 4-wire connections, 10m low-loss cable, and precision-machined waterproof glands.

Each probe featured a compact 25mm sensing element, carefully encapsulated and tested during manufacture to ensure long-term stability and accuracy exceeding IEC 60751 tolerances. To ensure reliable multi-channel measurements, the complete solution also included a milliK Precision Thermometer and an 8-channel millisKanner scanner.

Calibration Assurance

The full system—probes, thermometer, and scanner—was calibrated in our ISO 17025-accredited laboratory, with traceable results and a combined uncertainty of 15mK or better. Isotech's UKAS calibration covered the full operating range, with results documented to support critical performance verification in the field.

ISOTECH

Whitepaper

Key Results and Value Delivered

- Fully waterproof metrology probes for submerged use, with Inconel construction and custom cable glands.
- Integrated system calibration to deliver traceability with a combined uncertainty of 15mK or better.
- A custom solution developed from proven standards, tailored to a unique temperature-controlled environment.
- Flexible design and testing collaboration to meet technical needs without compromising reliability.

Help and Advice

If you need low uncertainty measuring systems we can help, contact us for free advice and consultation. We have proven solutions at all levels in temperature metrology, from high accuracy cost effective industrial measurements systems to the lowest uncertainty systems for primary metrology used by the world's leading National Metrology Institutes.

If you have any questions, if you need any advice, if you would like a free consultation then please get in touch