ISOTECH

# Whitepaper

- Precision Calibration – *Wherever It's Needed*
- On-site solutions for non-removable, irregularly shaped sensors
- Tailored thermal blocks and angled reference probes
- Lab-grade accuracy, even in complex, real-world conditions

# On-Site Accuracy for Distillation Systems

## Custom Calibration for Embedded Glass and Metal Temperature Sensors

### *Experience and Flexibility – Custom Calibration Solutions for Complex Sensors*



In the world of process instrumentation and temperature measurement, challenges cannot always be solved with standard solutions. That was exactly the case when a client approached us needing to calibrate thermometers embedded in compact vapor-phase assemblies—components typically found in analytical and distillation systems.

These sensors, made of both glass and metal, were unusually short, had unconventional shapes, and were permanently installed—meaning calibration could only happen on-site. Off-the-shelf solutions would not do. The solution had to be precise, traceable, portable, and capable of delivering consistent results.

### A Flexible, Consultative Approach

With decades of temperature calibration experience behind us, we took a flexible and collaborative approach from the very start. It was clear this would need more than a custom insert—it called for a custom-engineered solution, including a brand-new thermal block and a specially designed reference sensor.



We selected the Gemini 550LRI dry block calibrator as the foundation, thanks to its large block, wide temperature range, and excellent stability. From there, our engineers created a bespoke aluminium block with multiple precision pockets—each one tailored in depth and diameter to match the client's unique sensor shapes. We also included an extra pocket to allow for future expansion.

But that was not all. Standard reference probes would not work with such shallow immersion depths, so we developed a custom angled Pt100 reference thermometer. Its design allowed for full immersion during lab calibration in our ISO 17025 UKAS-accredited laboratory, and to be used for effective comparisons in the field.

This innovative setup ensured measurement traceability was maintained—even when working in non-ideal, real-world conditions.

### Key Results and Value Delivered

- A precision fit for complex sensor shapes—no workarounds or compromises needed.
- A purpose-built angled reference probe for shallow immersion use.
- Designed specifically to suit short metal and glass sensors.

### 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**