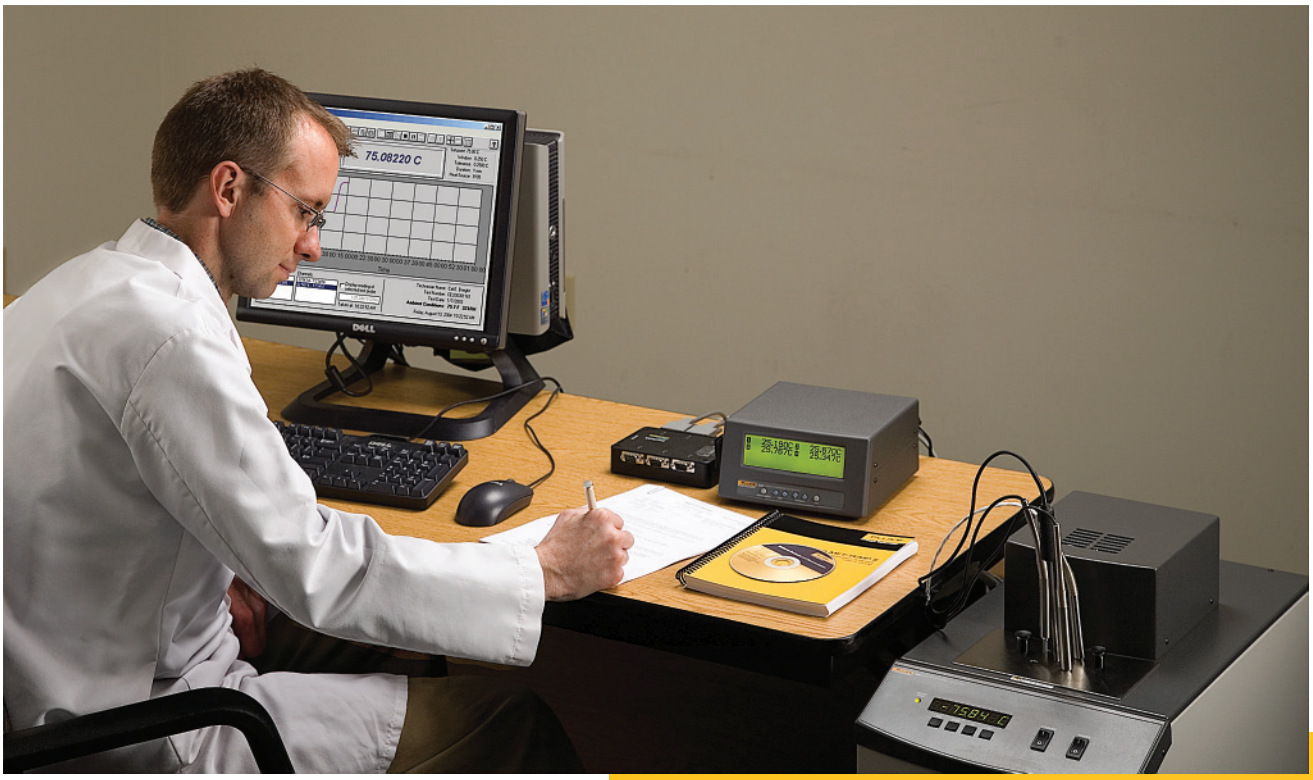
FLUKE®

Calibration

Automated 7380 temperature calibration systems

Technical Data

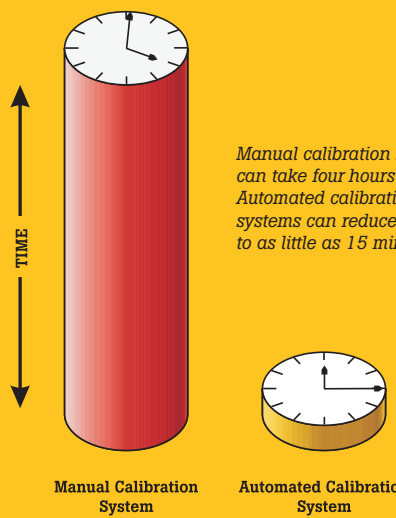


Why spend more time than necessary to calibrate PRTs, thermistors, and thermocouples? With a 7380 automated temperature calibration system from Fluke Calibration, you can perform consistent, repeatable calibrations quickly and efficiently. When the calibration is complete, you simply print out the report. It's that easy.

Each system comes complete with everything you need to automate the calibration of PRTs, thermistors and thermocouples, including a bath for calibrations down to –80 °C, a reference thermometer probe (PRT), and a readout that can measure up to four temperature sensors. An automation package is included to minimize labor costs and maximize return on investment.

An automated calibration system keeps electronic records of the calibration. The test procedure is executed the same way every time. Your auditor will love this. Managers have to find ways to produce better results with fewer resources and with an automated calibration system that is just what they will get. Less time is spent with each calibration and so productivity goes through the roof with

- Better value than when purchased separately
- Application note simplfies uncertainty analysis
- Significant reduction in labor costs



Manual calibration systems can take four hours or more. Automated calibration systems can reduce the time to as little as 15 minutes.

consistent results. In addition to freeing up time, it becomes possible to put the most experienced technicians on more challenging tasks because less training is required to run an automated procedure. Finally, our application note, *Calculating uncertainties in an automated temperature calibration system,* simplifies the process of producing an uncertainty analysis.

7380 compact calibration bath

This bath features stability and uniformity better than ± 0.008 ºC and metrology-level performance in a lab-friendly size.

Fluke Calibration has been making the world's best-performing temperature baths for more than two decades. With our proven heating/cooling designs and hybrid analog-digital controller, Fluke Calibration baths apply the most effective technologies that are commercially available.

For ultra-cold temperatures, the 7380 reaches –80 °C quickly and maintains a two-sigma stability of ± 0.006 °C when it gets there. The 7380 is a true metrology bath, not a chiller or circulator. With uniformity and stability performance so high, comparison calibration of temperature devices can be performed with impressively low uncertainty.

5615 reference PRT

This secondary reference platinum resistance thermometer (PRT) offers affordable wide-range accuracy, excellent stability and a reference-grade platinum sensing element. It features an Inconel™ 600 sheath that is 305 mm (12 in) long and 6.35 mm (0.250 in) in diameter. It has short-term accuracy of ± 0.013 °C at 0.01 °C.

The element is constructed of reference-grade platinum wire (99.999 % pure) for excellent stability. The wire is wound in a coil and placed in a mandrel, where it is uniformly supported in a manner that virtually eliminates hysteresis. These Inconel™-sheathed probes have a fully supported sensing element, making them more durable than SPRTs.

1529 Chub-E4 thermometer readout

This readout features four channels, three major sensor types, lab-quality accuracy, battery power, the ability to read many different sensor types, and much, much more.

The Chub-E4 has four inputs for reading four different sensors simultaneously. All four channels in the 7380-USR are configured for reading resistance based temperature sensors such as PRTs and thermistors. The 7380-USRT comes with two of the channels dedicated to thermocouple measurement. With the 1529, reading thermocouples, PRTs, and thermistors accurately from the same device is no problem.

The memory and communications capabilities of the Chub-E4 make it perfect for lab calibration work, but it's also great for on-site measurements, and remote data logging (store up to 8,000 measurements including date and time stamps).



Fourteen different logging intervals may be selected, from 0.1 second to 60 minutes.

MET/TEMP II temperature calibration automation software

This easy-to-use software cuts calibration time by more than half that of non-automated systems.

Calibrating sensors manually is expensive because of labor costs. It takes roughly four hours to calibrate a sensor at three points, then another hour to document the temperature data and create the certificate.

With MET/TEMP II, simply place your test sensors in the bath, connect them to the readout, and enter your setup data into a PC. Later, print the reports, sign them, and ship the sensors back to your customer. What once took four hours of direct labor can be reduced to as little as fifteen minutes. Calibration reports are created automatically from your setup data and test results.

Fast turnaround times improve customer satisfaction, and reduced labor costs improve the bottom line.

Recommended bath fluids for the 7380 automated calibration system†

Model #	Fluid	Usable range	Flash point (closed cup)
5019	Halocarbon 0.8 Cold Bath Fluid	–100 °C to 70 °C	n/a
5022	Dynalene HF/LO	–65 °C to 58 °C	60 °C
5023	HFE Cold Bath Fluid	–75 °C to 100 °C	n/a
n/a	methanol	–96 °C to 10 °C	12 °C
n/a	ethanol	–100 °C to 14 °C	16 °C

† Bath fluid must be ordered separately.

Most people use the 5019 fluid with the 7380 bath. The wide usable range of the fluid allows you to take better advantage of the bath's full temperature range. If you're willing to trade a few degrees on the low end for more range on the high end, then another good choice is the 5023 fluid. If you're only interested in reaching low temperatures, then methanol and ethanol are easy to find locally. Methanol, however, is toxic and can be inhaled or absorbed through the skin, so special care should be taken when handling it, especially when filling the bath.

Information about choosing a bath fluid is available on our website.

Customizing the access cover

Probes can be held in place in the bath by using probe clamps or drilling holes in the access cover. Other fixtures to hold the probes can be designed. The object is to keep the reference probe and the probe(s) to be calibrated closely grouped in the working area of the bath. Bath stability is maximized when the bath working area is kept covered. This is because evaporation and condensation are slowed by keeping the bath covered. An example of an access cover with holes drilled in it is shown in the picture below.



FLUKE®
Calibration

Summary specifications

Range	–80 °C to 100 °C (actual results are limited by range of bath fluid)
Estimated system calibration uncertainties for PRTs (k=2)†	–80 °C, ± 0.021 °C –38 °C, ± 0.022 °C 0 °C, ± 0.026 °C 100°C, ± 0.032 °C
Bath access opening	86 mm x 114 mm (3.25 in x 4.56 in)
Bath depth	178 mm (7 in)
Cooling time	130 minutes from 25 °C to –80 °C
Volume	4 liters (1 gal)
Software requirements	Windows® 2000 Windows® XP
Hardware requirements	CD-ROM drive for installation RS-232 serial (COM) port Minimum of 12 MB disk space

†See *Calculating uncertainties in an automated temperature calibration system* application note for a step-by-step tutorial on evaluating your uncertainties with this system.

Configurations

Model	Voltage	1529	1529-R	7380	5615	9938
7380-USR	120 V/60 Hz		x	x	x	x
7380-USRT	120 V/60 Hz	x		x	x	x
7380-UKR	220 V/50 Hz		x	x	x	x
7380-UKRT	220 V/50 Hz	x		x	x	x
7380-CHR	220 V/50 Hz		x	x	x	Chinese Reports
7380-CHRT	220 V/50 Hz	x		x	x	Chinese Reports
7380-OTR	220 V/50 Hz		x	x	x	x
7380-OTRT	220 V/50 Hz	x		x	x	x

Ordering information†

Models	See configurations table above
7380-USR	Bundle, Automated 7380 System, US
7380-USRT	Bundle, Automated 7380 System, US
7380-UKR	Bundle, Automated 7380 System, UK
7380-UKRT	Bundle, Automated 7380 System, UK
7380-CHR	Bundle, Automated 7380 System, China
7380-CHRT	Bundle, Automated 7380 System, China
7380-OTR	Bundle, Automated 7380 System, other non US
7380-OTRT	Bundle, Automated 7380 System, other non US
5019†	Fluid, Halocarbon, 4 liters
5022†	Fluid, Dynalene HF/LO, 4 liters
5023†	Fluid, HFE Cold Bath, 4 liters

† Bath fluid must be ordered separately

Fluke Calibration.
Precision, performance, confidence.™

- Electrical
- RF
- Temperature
- Pressure
- Flow
- Software

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Specifications subject to change without notice.
Printed in U.S.A. 9/2011 3079592B_EN-N
Pub_ID: 11274-eng Rev 02

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