CALIBRATION EQUIPMENT

Accurate temperature measurements are crucial for ensuring optimal performance, reliable data, and, most importantly, the well-being and safety of individuals.

However, over time, thermometers can experience deviations in accuracy due to factors such as how often they're used and the type of the environment they're used in.

Checking the accuracy of your thermometers can be done yourself using specialised equipment, or it can be sent to a laboratory for professional calibration and certification. Recalibration will need to take place in a laboratory.

CALIBRATION FREQUENCY

In many industries, the general recommendation is to calibrate your thermometers at least once a month. But certain situations may require more frequent calibration, such as high usage or particular regulatory requirements.

However often you calibrate your thermometers, it's essential to record the date and results of every test.

TYPES OF CALIBRATION EQUIPMENT

There are many ways to calibrate thermometers. The different methods available depend on your thermometer type, budget, the quantity and frequency of your thermometer calibration, and how accurate you would like the process to be.

For probes, an ice bath is a great budget method, but for higher accuracy and usage, a dry block calibrator is more reliable.

To calibrate a thermometer with switchable probes, test caps and Microcals are quick, economical and reliable.

For infrared and reference thermometers, the comparator is a reliable budget option when used with care. For a more accurate solution that is suitable for checking multiple devices regularly, choose a black body calibrator.

In addition, most users will need a high-accuracy reference thermometer to carry out the processes above.

CERTIFIED RECALIBRATION

If your tests show that your thermometer readings have drifted, you'll need to send them to a laboratory for recalibration. Our in-house UKAS laboratory recalibration offers certification for temperature probes, humidity meters and infrared thermometers at your desired checkpoints.

REFERENCE THERMOMETERS

- 5-point UKAS Certificate of Calibration included
- ±0.03 °C high system accuracy
- Supplied complete with high accuracy probe
- Ideal for calibration comparison checks

The Reference thermometers are high accuracy PT100 instruments that are supplied with a five-point UKAS Certificate of Calibration. Each certificate indicates deviations from standards at various check points: -18, 0, 40, 70 and 100 °C. Special points may be certified by arrangement with our UKAS calibration laboratory.

The Reference thermometers are ideal for comparison checking of the accuracy of other thermometers and probes, when used in conjunction with a stable temperature heat or chill source, see page 105. The instruments measure temperature over the range of -199.99 to 199.99 °C with a resolution of 0.01 °C and an accuracy of ±0.03 °C.

The units feature a simple on/off push button with open circuit 'Err' and low battery indication, when applicable. The Reference Plus thermometer incorporates the additional features of a max/min and hold function.

The Reference thermometers are supplied with a permanently attached, high accuracy probe incorporating a 1/10th DIN PT100 sensor. The probe measures Ø3.3 x 130 mm and is supplied with a one metre PVC lead.

0601

- **Low cost calibration checker**
  The Comparator (814-132) provides an inexpensive way of checking the temperature of infrared thermometers when used in conjunction with a Reference thermometer.

Order code	Description
222-055	Reference
222-063	Reference Plus
830-221	Protective silicone cover - white
814-132	Comparator

HOLD | MAX/MIN | AUTO OFF | UKAS

Specification	Reference & Reference Plus
Range	-199.99 to 199.99 °C
Resolution	0.01 °C
Accuracy	±0.03 °C (-49.99 to 149.99 °C) otherwise ±0.1 °C
Battery & life	3 x 1.5 volt AAA - 2000 hours
Sensor type	PT100 1/10th DIN
Display	10 mm LCD
Dimensions	25 x 56 x 128 mm
Weight	210 grams
UKAS Certificate of Calibration included	

REFERENCE THERMAPEN® THERMOMETER

- High accuracy ±0.05 °C
- 5-point UKAS Certificate of Calibration included
- Compact, lightweight and easy-to-use
- Backlight display

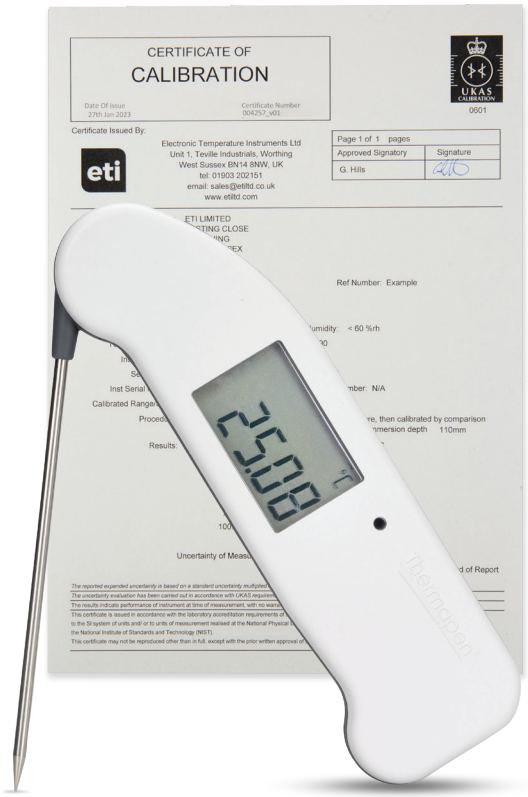
0601

The Reference Thermapen thermometer is a high accuracy PT100 instrument that is supplied with a five-point UKAS Certificate of Calibration. Each certificate indicates deviations from standards at various check points: -18, 0, 40, 70 and 100 °C.

The Reference Thermapen thermometer is ideal for comparison checking of the accuracy of other thermometers and probes, when used in conjunction with a stable temperature heat or chill source, see opposite. The instrument measures temperature over the range of -69.99 to 199.99 °C, featuring a user selectable resolution of 0.01 or 0.1 °C and an accuracy of ±0.05 °C.

The thermometer will power-off automatically after ten minutes, maximising battery life. This feature can be disabled if not required. Both low battery (icon) and open circuit indication are displayed, when applicable. Each Reference Thermapen is powered by a single AAA battery with a life expectancy of 500 hours (without backlight).

The Reference Thermapen incorporates a stainless steel, penetration probe (Ø3.3 x 108 mm) that conveniently folds back through 180° into the side of the instrument when not in use.



- ACCESSORIES
  See page 7 for details

- Stainless steel wall bracket (832-002)
  Stores the Reference Thermapen safely when not in use. Keyhole slot for hanging (screws not supplied) Measures 27 x 58 x 115 mm

- Silicone cover with magnets (830-455)

Supplied in a 830-001 zip pouch with belt loop

Order code	Description
222-215	Reference Thermapen
830-455	Silicone cover with magnets
832-002	S/steel wall bracket
The Thermapen is supplied in a zip pouch (830-001)	

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Specification	Reference Thermapen
Range	-69.99 to 199.99 °C
Resolution	0.01 °C or 0.1 °C - user selectable
Accuracy	±0.05 °C (-30 to 149.99 °C) otherwise ±0.2 °C
Battery	1 x 1.5 volt AAA
Battery life	500 hours (without backlight)
Sensor type	PT100
Display	9.8 mm LCD
Dimensions	19.3 x 48.2 x 156.2 mm
Weight	115 grams
UKAS Certificate of Calibration included	

3000 SERIES LIGHTWEIGHT DRY-WELL CALIBRATORS

- Ideal for checking thermometer accuracy
- Portable temperature heat source

The 3000 series dry-well calibrators are small and lightweight heat sources, ideal for checking the accuracy of digital thermometers and temperature probes. The units have a temperature range of 33 to 250 °C with a resolution of 0.1 °C.

The dry-wells offer a high level of stability (±0.5 °C) and a stabilisation time of ten minutes. Plug it in, switch it on, set the verification temperature with the front panel buttons and insert your probe into the correct size well. Compare the temperature reading of your thermometer against the display and the difference is the error.

The 3001 dry-well will accept probe sizes Ø3.3, 4, 4.76 and 6.35 mm. The 3002 dry-well will accept probe sizes Ø3.3, 4.76, 6.35 and 9.6 mm. The 3003 dry-well will accept probe sizes Ø4.76 and 12.7 mm.

Order code	Description
271-301	3001 dry-well
271-302	3002 dry-well
271-303	3003 dry-well

Specification	3000 series dry-wells
Range	33 to 250 °C
Resolution	0.1 °C
Accuracy	±0.5 °C (33 to 199.9 °C)
	±1 °C (200 to 250 °C)
Heating time	Ambient to 250 °C - min. 10 minutes
Well depth	100 mm
Power	230 volt AC (115 volt available)
Dimensions	57 x 125 x 158 mm
Weight	950 grams
*Supplied with 230/115 volt AC power adaptor FREE traceable certificate of calibration included	

3101 DRY-WELL HEAT/COOL SOURCE CALIBRATOR

- Ideal for checking the accuracy of thermometers
- Accepts a wide variety of probe diameters

The 3101 dry-well features an easy-to-read LED display with a temperature range of -10 to 110 °C and a resolution of 0.1 °C. Heating time, ambient to 100 °C or cooling time, ambient to 0 °C is ten minutes.

The 3101 is excellent for checking the calibration of a wide range of instrumentation including digital thermometers and temperature probes, either above or below ambient temperature. The unit incorporates two removable wells/inserts, both Ø13 mm in diameter and will accept probe sizes Ø3.3, 4.1, 4.8, 6.4 and 9.6 mm.

Each 3101 is supplied with two inserts of the customer's choice.

Order code	Description
271-401	3101 dry-well
271-321	Ø3.3 mm ID brass insert
271-322	Ø4.1 mm ID brass insert
271-323	Ø4.8 mm ID brass insert
271-324	Ø6.4 mm ID brass insert
271-325	Ø9.6 mm ID brass insert

Specification	3101 dry-well
Range	-10 to 110 °C
Resolution	0.1 °C
Accuracy	±0.5 °C (-10 to 99.9 °C)
	±1 °C (100 to 110 °C)
Heating time	Ambient to 100 °C - min. 10 minutes
Cooling time	Ambient to 0 °C - 10 minutes
Well depth	100 mm
Power	12 to 24 volt DC*
Dimensions	110 x 153 x 186 mm
Weight	1.8 kilograms
*Supplied with 230/115 volt AC power adaptor FREE traceable certificate of calibration included	

IR-500 BLACK BODY CALIBRATOR

- Ideal for checking the accuracy of infrared thermometers
- Wide temperature range 50 to 500 °C

The IR-500 Black Body Calibrator is a stable heat source for checking the calibration of infrared digital thermometers that require regular temperature calibration checks or validation. The unit features an easy to read LED display, and controls the black body surface temperature over the range of 50 to 500 °C. It reaches an upper temperature of 500 °C in about 40 minutes.

Simply set the verification temperature on the digital display of the IR-500 Calibrator, allow time to stabilise and then point your infrared thermometer at the Ø58 mm black body. Compare the temperature readings on the IR-500 Calibrator display and the infrared thermometer under test, and the difference is the error. The isothermal Ø58 mm black body target is manufactured to an emissivity of approximately 0.95, which is ideal for most industrial infrared thermometers.

For increased accuracy checks, use a Reference thermometer (see page 103 for more details), insert the fixed Ø3.3 mm precision PT100 probe into the pre drilled calibration well. UK power lead included.

Order code	Description
822-400	IR-500 Black Body Calibrator

Specification	IR-500 Black Body Calibrator
Range	50 to 500 °C
Resolution	0.1 °C/ °F
Accuracy	±1 °C below 100 °C ±2 °C from 100 to 200 °C ±3 °C from 200 to 500 °C*
Heating time	40 minutes to max
Cooling time	30 minutes max to 100 °C
Emissivity	0.95
Target size	Ø58 mm
Power	110 volt AC, 3A or 230 volt AC (±10%), 1.5A
Dimensions	114 x 180 x 233 mm
Weight	2.682 kilograms
FREE traceable certificate of calibration included	

*It is possible to achieve a higher level of accuracy, better than ±0.5 °C if the IR-500 Calibrator is used in conjunction with a certified Reference Thermometer (see page 103 for details).

CALIBRATION WATER BATH

- Ideal for checking the accuracy of probe thermometers
- Temperature range 25 to 95 °C

The Calibration Water Bath offers a compact, accurate and reliable system which can be used for the temperature calibration of thermometers and temperature probes using the comparison method. The bath operates over the range 25 °C to 95 °C with a temperature accuracy of ±1 °C (25 to 70 °C) * and stability of ±0.1 °C with a bath uniformity of ±0.1 °C when measured from centre to any corner.

The water bath features a user friendly LED display, with minimal setup required. The stainless steel bath capacity is 5 litres, and incorporates a variable flow/speed pump of 0 to 20 litres per minute. For increased accuracy checks, it is recommended that a Reference thermometer is used as a calibration reference. (See page 103 for more details).

For continuous use in the temperature range 25 to 60 °C we recommend the bath be filled with distilled water, between 60 to 80 °C 15% glycerine water solution and between 80 to 95 °C a suitable silicone oil.

Each bath is supplied complete with lid, drain tap and carry handles. UK power lead included.

Order code	Description
822-950	Calibration Water Bath

Specification	Calibration Water Bath
Range	25 to 95 °C
Resolution	0.1 °C/ °F
Accuracy	±1 °C (+25 to 70 °C)*
Bath capacity	5 litres
Pump flow/speed	0 to 20 litres per minute
Bath stability	±0.1 °C over a 45 minute period
Bath uniformity	±0.1 °C when measured from centre to any corner
Power	230 volt AC (±10%) 1.5A
Internal dimensions	130 x 130 x 260 mm
External dimensions	318 x 380 x 445 mm
Weight	12 kilograms

*It is possible to achieve a higher level of accuracy, better than ±0.2 °C if the calibration bath is used in conjunction with a certified Reference Thermometer (see page 103 for details).

MICROCAL SIMULATORS

- Test thermocouple type K, J, T, R, N, S & E thermometers
- For frequent checking of thermometer accuracies
- 12 adjustable or 23 fixed temperature points
- 4 models available – Simulator or Simulator/thermometer

The MicroCal thermocouple simulators help ensure that the frequent checking of thermometer accuracies are a routine operation. These instruments are designed to simulate a chosen temperature to test thermocouple thermometers without the need for specialised equipment or conversion tables. The MicroCal 1 Plus also measures and simulates temperature.

The MicroCal 1, MicroCal 1 Plus & the MicroCal 2 have 12 preset temperatures for type K thermocouple -20, -10, 0, 10, 30, 50, 100, 195, 250, 500, 800 and 1000 °C, any of these temperatures can be modified and saved by the user. The factory default temperatures can be recalled at any time.

The MicroCal 3 has 23 fixed temperature points for type K thermocouple -100, -50, -20, -10, 0, 10, 20, 30, 40, 50, 60, 80, 100, 150, 195, 250, 300, 400, 500, 600, 800, 1000 and 1200 °C.

All models feature a custom 10 mm LCD display with alpha-numeric display line to prompt the user when changing parameters. Selectable parameters include; °C/°F, auto-power-off - enable/disable, CJC - internal/external and display contrast adjustment.

Each MicroCal is supplied with a one metre PVC thermocouple lead with miniature thermocouple connectors and a five-point UKAS Certificate of Calibration. Each certificate indicates deviations from standards at the various points.

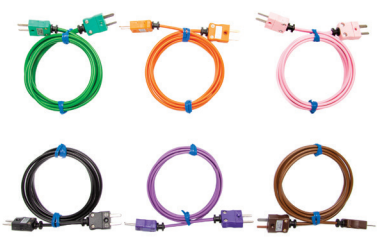
An optional lead set is available for the MicroCal 1 and MicroCal 1 Plus comprising of six leads, one for each thermocouple type K, J, T, R/S, N and E.

Thermocouple type K	Range	-200 to 1372 °C
Thermocouple type J	Range	-200 to 1200 °C
Thermocouple type T	Range	-270 to 400 °C
Thermocouple type R	Range	0 to 1768 °C
Thermocouple type N	Range	-200 to 1300 °C
Thermocouple type S	Range	0 to 1768 °C
Thermocouple type E	Range	-140 to 1000 °C

CALIBRATION EQUIPMENT

Incorporates a foot stand

Lead Set (6 leads) 816-100



Order code	Description
271-100	MicroCal 1
271-101	MicroCal 1 Plus
271-200	MicroCal 2 - type K
271-210	MicroCal 3 - type K
816-100	Lead set (6 leads)
830-205	Protective silicone cover
832-115	Acrylic wall bracket

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Specification	MicroCal 1 & 1 Plus	MicroCal 2	MicroCal 3
Range	(see table above)		
Temp points	12 adjustable presets	12 available	23 fixed presets
Accuracy	±0.3 °C (dependant upon tc type)	±0.3 °C	±0.5 °C
Battery	2 x 1.5 volt AAA		
Battery life	300 hours		
Sensor type	Thermocouple type K, J, T, R, N, S & E (selectable)	Dedicated type K thermocouple	
Display	Custom LCD		
Dimensions	35 x 73 x 141 mm		
Weight	175 grams		
5-point UKAS Certificate of Calibration included			

For more information on the above simulators please visit our website or contact our sales office.

MICROCHECK 3-POINT CHECKER/SIMULATOR

- For regular checking of thermometer accuracies
- 3-point UKAS Certificate of Calibration
- Simple & easy-to-use
- 4 models available

The MicroCheck temperature checkers have been developed to verify the continuing accuracy of type K thermocouple thermometers with a 0.1 or 1 °C resolution.

All checkers feature a custom 10 mm LCD display with alpha-numeric display line to prompt the user when changing parameters. Selectable parameters include: °C/°F, auto-power-off - enable/disable, CJC - internal/external and display contrast adjustment.

The MicroChecks simulate three fixed temperatures, enabling users to check the accuracy of each instrument at three known points without the need for specialist equipment.

Each MicroCheck is supplied with a one metre PVC type K thermocouple lead with miniature connectors and a three-point UKAS Certificate of Calibration. Each certificate indicates deviations from standards at the various points.

A 3-point UKAS Certificate of Calibration is included with each MicroCheck checker

Acrylic wall bracket (832-115)

Protective silicone cover (830-205)

Specification	Range
MicroCheck 1	0 °C, 100 °C & 500 °C
MicroCheck 2	-20 °C, 20 °C & 200 °C
MicroCheck 3	-20 °C, 0 °C & 220 °C
MicroCheck 4	-20 °C, 0 °C & 100 °C

ilac-MRA

UKAS CALIBRATION 0601

AUTO OFF

UKAS

2 YEAR GUARANTEE

MADE IN BRITAIN

Specification	MicroCheck
Range	(see table above)
Temp points	3 fixed temperatures
Accuracy	±0.5 °C
Battery	2 x 1.5 volt AAA
Battery life	300 hours
Sensor type	type K thermocouple
Display	Custom LCD
Dimensions	35 x 73 x 141 mm
Weight	175 grams
UKAS Certificate of Calibration included	

Order code	Description
271-011	MicroCheck 1
271-012	MicroCheck 2
271-014	MicroCheck 3
271-015	MicroCheck 4
830-205	Protective silicone cover
832-115	Acrylic wall bracket

CALIBRATION THERMISTOR TEST CAPS

- Provides assurance that thermometer readings are accurate
- Supplied with a UKAS Certificate of Calibration

0601

These thermistor test caps are suitable for checking the accuracy of the Therma 20, Therma 22 or any equivalent thermistor thermometer.

Simply plug in the desired test cap and the display on the thermometer should show the same temperature as the certified value.

Each test cap is supplied with a UKAS Certificate of Calibration with a guaranteed uncertainty of ±0.1 °C.

Order code	Description
286-001	Thermistor test cap -18 °C
286-002	Thermistor test cap 0 °C
286-003	Thermistor test cap 3 °C
286-004	Thermistor test cap 70 °C
286-005	Thermistor test cap 100 °C
UKAS Certificate of Calibration included	

CALIBRATION PT100 TEST CAPS

- Validates the accuracy of PT100 thermometers
- Supplied with a UKAS Certificate of Calibration

0601

These PT100 test caps are suitable for checking the accuracy of the Precision PT100 thermometer or any platinum resistance thermometer fitted with a Binder connector.

Simply plug in the test cap and the display on the thermometer should show the same temperature as the certified value.

Each test cap is supplied with a UKAS Certificate of Calibration with a guaranteed uncertainty of ±0.1 °C.

Order code	Description
282-001	PT100 test cap -18 °C
282-002	PT100 test cap 0 °C
282-003	PT100 test cap 3 °C
282-004	PT100 test cap 70 °C
282-005	PT100 test cap 100 °C
UKAS Certificate of Calibration included	