

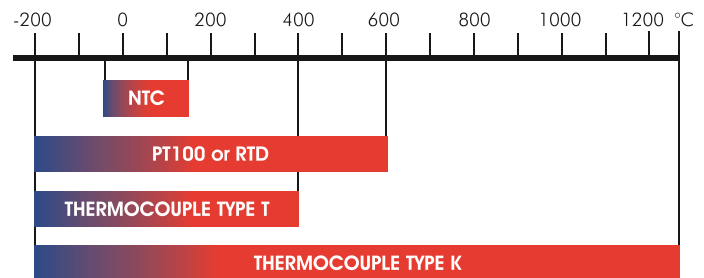


Selecting the correct thermometer for an application is by definition very important, to achieve the maximum accuracy and repeatability of the temperature reading.

The selection criteria for a digital thermometer should include:

- measurement range
- resolution of the reading 1 °C, 0.1 °C or 0.01 °C
- desired accuracy
- response time
- additional features such as max/min, hold & backlight

Our digital thermometers utilise one of three types of temperature sensors: thermocouple, NTC thermistor and resistance temperature detectors (PT100 or RTD). Thermocouple thermometers and probes are fast to respond to changes in temperature, they also have a wide measurement range. Resistance temperature detector and NTC thermistor thermometers and probes are slower to respond to changes in temperature, but generally more accurate, although thermistor probes have a limited measurement range.



### NTC thermistors

- NTC thermistor probes are also based on a temperature dependent resistance change in the sensor element. But unlike resistance thermometer detectors, thermistors have a negative temperature coefficient, i.e the resistance decreases with increasing temperature.

### resistance temperature detectors

- Resistance temperature detector (PT100 or RTD) probes consist of a flat film or wire wound platinum resistance sensor element. The measurement resistance value changes in line with the temperature being measured.

### thermocouples

- Thermocouple probes consist of two wires of dissimilar metals or metal alloys welded together. Thermocouples are based on the thermoelectric (Seebeck) effect. There are various types of thermocouple, types K and T being the most common, although type K is by far the most widely used.

# Therma 1, 3 & Elite Thermometers

## robust & lightweight instruments

- Elite model includes backlight & max/min functions
- FREE traceable certificate of calibration
- interchangeable thermocouple probes
- minimum 5 years battery life

The Therma 1 and 3 digital thermometers are rugged and easy to use instruments that operate through the range of -100 to 1372 °C with a 0.1 °C or 1 °C resolution. The thermometers are housed in a robust ABS case that contains 'Biomaster' additive which reduces bacterial growth.

The Therma 1 and 3 feature large, easy to read, LCD displays with open circuit 'Err', hold and low battery indication. Each thermometer is powered by three AAA batteries that give a minimum of five years battery life. The units will power off automatically after ten minutes, maximising battery life. This feature can be disabled by the user, if not required.

We offer an extensive range of interchangeable type K thermocouple probes for a variety of different applications, see pages 71 to 76 for full details.

### Therma Elite thermometer

The Therma Elite incorporates all the features of a Therma 1 thermometer, but with the addition of a backlit display, max/min memory function and a mode button for the selection of 0.1/1 °C/°F. The thermometer also incorporates a calibration trim function ( $\pm 2$  °C) which allows the user to compensate for thermocouple probe errors.



order code	description
221-041	Therma 1
221-043	Therma 3
221-061	Therma Elite
123-160	penetration probe
830-227	protective silicone boot - black
832-053	s/steel wall bracket & boot

the Therma series is exclusive of probe



penetration probe  
Ø3.3 x 130 mm (123-160)



### optional accessories

- protective silicone boot - the Therma series is splashproof to IP64 when used in conjunction with this boot. Various colours are available - see page 13 for details
- stainless steel wall bracket (*screws not supplied*) and protective black silicone boot (832-053)



specification	Therma 1/Elite	Therma 3
range 0.1 °C	-99.9 to 299.9 °C	n/a
range 1 °C	300 to 1372 °C	-100 to 1372 °C
resolution	0.1 °C & 1 °C	1 °C
accuracy	$\pm 0.4$ °C $\pm 0.1$ %	$\pm 1$ °C
battery	3 x 1.5 volt AAA	
battery life	minimum 5 years (10000 hours)	
sensor type	K thermocouple	
display	12 mm LCD	
dimensions	25 x 56 x 128 mm	
weight	130 grams	

FREE traceable certificate of calibration included

# Therma Waterproof Thermometer

## robust & waterproof to IP66/67

- interchangeable thermocouple probes
- backlight, max/min & hold functions
- integrated rubber seal for durability
- large, easy to read backlit LCD

The Therma Waterproof thermometer is housed in a robust waterproof black ABS case which offers IP66/67 protection. The thermometer utilises state of the art electronic circuitry, designed for reliability and ease of use and can be submerged or washed under a running tap - ideal for industrial applications.

The thermometer measures temperature over the range of -99.9 to 299.9 °C with a 0.1 °C resolution, auto-ranging to 1 °C resolution over the range of 300 to 1372 °C.

The Therma Waterproof thermometer features a large easy to read, LCD display with max/min, hold, open circuit, low battery indication and a user selectable backlight. The unit also incorporates an auto-power off facility that automatically turns the instrument off after ten minutes, maximising battery life.

Each unit is housed in a durable, ABS case that incorporates an integrated rubber seal to ensure complete water tightness and help reduce the possibility of damage in harsh environments.

We offer an extensive range of interchangeable type K thermocouple probes, for a variety of different applications, see pages 71 to 76 for full details.



order code	description
232-101	Therma Waterproof
143-162	penetration probe
830-257	protective silicone boot - black

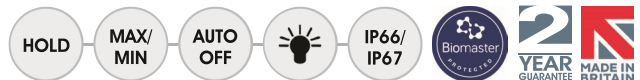
the Therma Waterproof is exclusive of probe



waterproof penetration probe  
Ø3.3 x 130 mm (143-162)

### optional accessories

- protective silicone boot. Various colours are available - see page 38 for details
- Probe Wipes - these anti-bacterial wipes are ideal for probes - see page 35



specification	Therma Waterproof
range 0.1 °C	-99.9 to 299.9 °C
range 1 °C	300 to 1372 °C
resolution	0.1 °C to 299.9 °C thereafter 1 °C
accuracy	±0.4 °C ±0.1 % of reading
battery	3 x 1.5 volt AAA
battery life	7500 hours
sensor type	K thermocouple
display	15 mm LCD
dimensions	32 x 71 x 141 mm
weight	220 grams

FREE traceable certificate of calibration included

# Legionnaires' Thermometer Kits

## for routine water temperature monitoring

Incorrect water temperature is a key risk factor for legionella growth. The legionella bacteria multiply in water at temperatures between 20 to 45 °C. A typical method of control is to store hot water above 60 °C and distribute it at above 50 °C (care must be taken to prevent scalding). Cold water should be kept below 20 °C. These kits represent excellent value-for-money and are supplied in a robust ABS carrying case. For a full specification on the Therma 1, see page 57 and for the Therma Waterproof thermometer, see page opposite.

### Legionnaires' thermometer kit

#### each kit contains:

- Therma 1 thermometer (221-041)
- penetration probe (123-160)
- precision ribbon surface probe (123-030)
- PTFE wire probe (133-362)
- water resistant countdown timer (806-150)
- mini tub of 70 Probe Wipes (836-022)
- ABS carrying case (834-150)

order code	description
860-860	Legionnaires' thermometer kit
FREE traceable certificate of calibration included	



Industrial

new



### waterproof Legionnaires' thermometer kit

#### each kit contains:

- Therma waterproof thermometer (232-101)
- waterproof penetration probe (143-162)
- precision ribbon surface probe (123-030)
- PTFE 1000 mm wire probe (133-362)
- water resistant countdown timer (806-150)
- mini tub of 70 Probe Wipes (836-022)
- ABS carrying case (834-135)

order code	description
860-870	WP Legionnaires' thermometer kit
FREE traceable certificate of calibration included	

### Legal responsibilities for testing for legionella

If you are the employer or person in control of premises, you must organise a risk assessment from exposure to legionella. The revised Approved Code of Practice (ACOP) Legionnaires' disease: Control of Legionella Bacteria in water systems (L8) issued by the Government's Health and Safety Executive (HSE) significantly extends the scope of its guidance on control of legionella bacteria in water. The code applies to all hot and cold water systems in the workplace regardless of their capacity, i.e. the lower limit of 300 litres previously used to exclude domestic systems, no longer applies. Whilst domestic systems may represent a risk, the code only applies to a risk arising from a work activity, but does include domestic landlords who have a duty to keep their tenants safe from health hazards. This means that all employers and landlords, who manage premises with hot/cold water systems and/or wet cooling systems, have a legal responsibility to identify any risk of contamination and to prevent or control it.

# Therma Differential Thermometer

## two channel, T1 or T2 or T1 minus T2 differential

- robust waterproof case offering IP66/67 protection
- ideal for radiator balancing or HVAC applications
- designed for plumbers, reliable & easy to use
- backlight, max/min & hold functions

The Therma Differential is a digital thermometer that allows the user to operate two type K thermocouple probes simultaneously. The display can be switched to show probe T1 or T2 temperature or the difference between probes T1 and T2 (T1-T2). This allows, for example, the temperature drop across radiators or the temperature rise or fall of two items being measured.

The Therma Differential measures temperature over the range of -99.9 to 299.9 °C with a 0.1 °C resolution or 300 to 1372 °C with a 1 °C resolution. The thermometer features a custom, LCD display with °C/°F, T1, T2, diff, hold, open circuit, low battery indication and a user selectable backlight. The unit incorporates an auto-power off facility that automatically turns the instrument off after ten minutes, maximising battery life.

Each unit is housed in a durable, ABS case that has an integrated rubber seal to ensure complete water tightness and help reduce the possibility of damage in harsh environments.

We offer an extensive range of interchangeable type K thermocouple probes, for a variety of different applications, see pages 71 to 76 for full details.



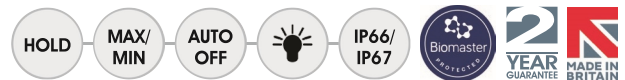
### optional accessories

- protective black silicone boot c/w foot stand and magnet for mounting on pipes, radiators etc.. (830-258)
- stainless steel wall bracket (screws not supplied) (832-015) - see page 34 for details



order code	description
231-022	Therma Differential
830-258	protective silicone boot - black
133-040	pipe clamp probe
832-015	stainless steel wall bracket

the Therma Differential is exclusive of probe



specification	Therma Differential
range 0.1 °C	-99.9 to 299.9 °C
range 1 °C	300 to 1372 °C
resolution	0.1 °C to 299.9 °C thereafter 1 °C
accuracy	±0.4 °C ±0.1 % of reading
battery	3 x 1.5 volt AAA
battery life	7500 hours
sensor type	K thermocouple
display	15 mm LCD
dimensions	32 x 71 x 141 mm
weight	220 grams

FREE traceable certificate of calibration included

# HVAC Thermometer Kits

## for everyday temperature monitoring



These HVAC thermometer kits are ideal for a wide range of plumbing and heating applications. The kits can be used to monitor both cold and hot water temperatures as well as undertake other routine HVAC checks. A typical application includes balancing radiators using a pair of clip-on pipe probes on the flow and return pipes at either end of the radiator. Starting with the radiator nearest the boiler, adjust the lockshield valve until you get a temperature drop of 11 °C across the two pipes. Then move on to the other radiators in turn.

These HVAC kits represents excellent value-for-money and are supplied in a carrying case/zip pouch. For 2018, the HVAC thermometer kit now includes a precision ribbon surface probe. For a full specification on the Therma Differential thermometer, see page opposite.

### budget HVAC thermometer kit

#### each kit contains:

- Therma Differential thermometer (231-022)
- 2 x pipe clamp probes (133-040)
- zip pouch (830-090)

order code	description
860-095	budget HVAC thermometer kit
FREE traceable certificate of calibration included	



### HVAC thermometer kit

#### each kit contains:

- Therma Differential thermometer (231-022)
- penetration probe (123-160)
- 2 x pipe clamp probes (133-040)
- precision ribbon surface probe (123-030)
- ABS carrying case (834-300)



order code	description
860-090	HVAC thermometer kit
FREE traceable certificate of calibration included	

### Legal responsibilities for safe surface & water temperatures

If you are the employer or person in control of premises you have a legal duty of care in respect of the risk of scalding or burning from hot water and hot surface temperatures. NHS and HSE guidelines state that surface temperatures of space heating devices such as thermal storage heaters, oil-filled radiators and conventional radiators should not exceed 43 °C. This will control and prevent patients from being burned. When the surface temperature exceeds 43 °C there is a high risk of burning, often leading to fatalities in the elderly, people with mental illness and learning disabilities or children who cannot react appropriately to prevent injury.

# MicroTherma 1 Thermometer

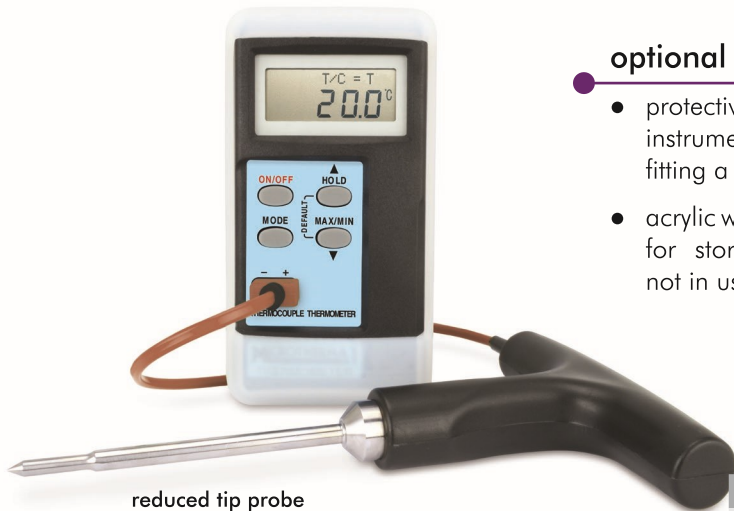
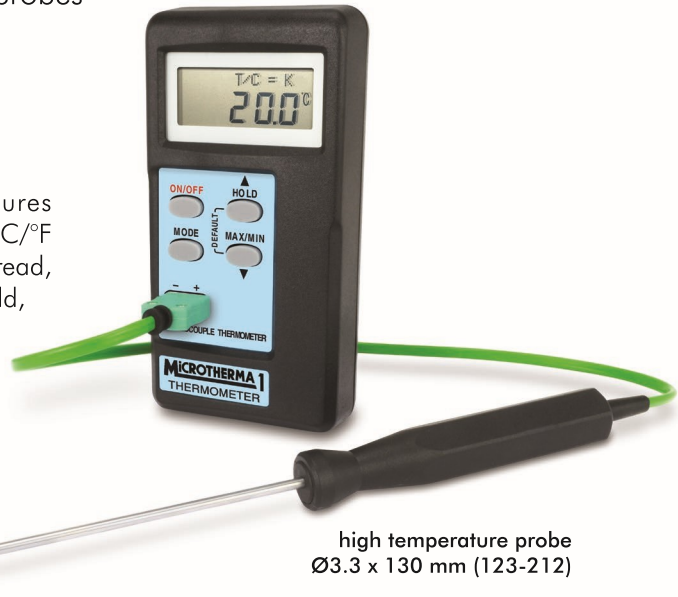
in-built microprocessor for automatic re-calibration

- $\pm 0.2$  °C high accuracy, 0.1 °C resolution over the full range
- multi-input type K, J, T, R, N, S & E thermocouple probes
- FREE traceable certificate of calibration
- should never need re-calibrating

The MicroTherma 1 microprocessor thermometer measures temperature over the range of -270 to 1768 °C with a 0.1 °C/°F resolution. Each MicroTherma 1 incorporates an easy to read, 4½-digit dual LCD display with open circuit, low battery, hold, max/min and °C/°F indication.

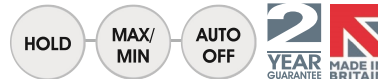
The thermometer should never need re-calibrating as the microprocessor enables the instrument to continuously and automatically carry out self-diagnostic re-calibration. An additional feature allows the user to adjust the reading ( $\pm 2.5$  °C) to offset any probe errors, correcting any inaccuracies of the thermocouple probe.

Each thermometer thereafter will automatically store, display the offset and adjust the instrument for the known probe error, maximising system accuracy. The MicroTherma 1 has the versatility of accepting any type K, J, T, R, N, S & E thermocouple probe, the probe type is simply selected through the mode button. The unit incorporates both max and min readings with a reset function and also features an auto-power off facility that maximises the battery life, turning the instrument off automatically after 30 minutes, this function can be disabled by the user, if not required. Other selectable parameters include: display contrast and internal CJC temperature reading. For details of the wide range of type K or type T thermocouple probes available, see pages 71 to 76.



## optional accessories

- protective white silicone boot - protect your instrument against accidental damage by fitting a boot (830-205)
- acrylic wall bracket (screws *not* supplied) - ideal for storing your thermometer safely when not in use (832-115)



order code	description	
221-091	MicroTherma 1	
123-212	high temperature probe	
137-126	reduced tip probe	
830-205	protective silicone boot	
832-115	acrylic wall bracket	

the MicroTherma 1 is exclusive of probe

specification	MicroTherma 1
range	-270 to 1768 °C
resolution	0.1 °C/°F
accuracy	$\pm 0.2$ °C $\pm 1$ digit
battery	2 x 1.5 volt AAA
battery life	1000 hours
sensor type	thermocouple type K, J, T, R, N, S & E - selectable
display	custom LCD
dimensions	35 x 73 x 141 mm
weight	175 grams

FREE traceable certificate of calibration included

# Therma 1T Thermometer

±0.2 °C high accuracy

- utilises high accuracy type T thermocouple probes
- FREE traceable certificate of calibration

The Therma 1T utilises a type T thermocouple sensor which offers both fast response and a measurement range of -100 to 400 °C with a 0.1 °C resolution. Each unit is housed in a robust ABS case that contains 'Biomaster' additive which reduces bacterial growth.

The Therma 1T thermometer features a large, easy to read, LCD display with open circuit and low battery indication. Each unit is powered by three AAA batteries that give a minimum of five years battery life. The instrument will power off automatically after ten minutes, maximising battery life. This feature can be disabled by the user, if not required.

Below is a small selection of our high accuracy (±0.2 °C) type T thermocouple probes, for alternative probes please contact our sales team or visit our website.



Industrial



order code	description
221-107	Therma 1T
830-221	protective silicone boot - white
832-050	s/steel wall bracket & boot

the Therma 1T is exclusive of probe




**fast response probe**  
Ø3.3 x 100 mm (127-159)

specification	Therma 1T
range	-100 to 400 °C
resolution	0.1 °C to 300 °C thereafter 1 °C
accuracy	±0.2 °C ±0.1% of reading
battery	3 x 1.5 volt AAA
battery life	minimum 5 years (10000 hours)
sensor type	T thermocouple
display	12 mm LCD
dimensions	25 x 56 x 128 mm
weight	130 grams

FREE traceable certificate of calibration included

## High Accuracy Temperature Probes

type T thermocouple probes - accurate to ±0.2 °C\*

		order code
<p><b>penetration probe</b></p>  <p><b>HIGH ACCURACY</b> Ø3.3 x 130 mm</p>	<p>This stainless steel penetration probe is strong, versatile and ideal for measuring liquids and semi-solids.</p> <ul style="list-style-type: none"> <li>• response time less than 3 seconds</li> <li>• probe temperature range -75 to 250 °C</li> </ul>	<p>127-160</p> <p>327-160 (coiled lead)</p>
<p><b>fast response probe</b></p>  <p><b>HIGH ACCURACY</b> Ø3.3 x 100 mm</p>	<p>This reduced tip, fast response, stainless steel probe is ideal for liquids or semi-solids i.e. soft rubber and other similar materials.</p> <ul style="list-style-type: none"> <li>• response time less than 2 seconds</li> <li>• probe temperature range -75 to 250 °C</li> </ul>	<p>127-159</p> <p>327-159 (coiled lead)</p>
<p><b>air or gas probe</b></p>  <p><b>HIGH ACCURACY</b> Ø4.5 x 130 mm</p>	<p>This stainless steel, fast response probe is ideal for measuring air temperature in chill cabinets, fridges, freezers, storage areas and similar.</p> <ul style="list-style-type: none"> <li>• response time less than 0.5 of a second</li> <li>• probe temperature range -75 to 250 °C</li> </ul>	<p>127-300</p> <p>327-300 (coiled lead)</p>

\*Please note: the above type T thermocouple probes offer a high accuracy of ±0.2 °C over the range of -20 to 70 °C

# Precision PT100 Thermometers

0.1 °C or 0.01 °C resolution with a high accuracy

- meets the European Standard EN13485
- high accuracy  $\pm 0.2$  °C or 0.05 °C
- interchangeable PT100 probes
- FREE certificate of calibration

High accuracy is one of the notable features of the Precision thermometers. There are two models available, the Precision and Precision Plus. The Precision measures temperature over the range of -199.9 to 499.9 °C with a 0.1 °C resolution and high accuracy of  $\pm 0.2$  °C. The Precision Plus measures temperature over the range of -199.99 to 199.99 °C with a 0.01 °C resolution and high accuracy of  $\pm 0.05$  °C. **Please note:** the accuracies quoted are for the instruments only.

Conveniently located on the front of the instrument are the on/off, max/min and display hold buttons. The Binder probe socket is positioned at the top of the instrument which enables a variety of probes to be used depending on the application.

The Precision thermometers feature a large, easy to read, LCD display with open circuit 'Err' and low battery indication. Each thermometer is powered by three AAA batteries that give a minimum of 2000 hours battery life. The unit will power off automatically after ten minutes, maximising battery life. This feature can be disabled by the user, if required.

We offer a range of interchangeable PT100 Class A probes for use with the Precision thermometer, see page 78 for full details. The Precision Plus is supplied with a PT100 1/10th DIN liquid probe (160-222) and a UKAS Certificate of Calibration.

For regularly checking the accuracy of each Precision thermometer, a range of calibration PT100 test caps complete with a UKAS Certificate of Calibration are available, see page 99 for details.



PT100 1/10th DIN liquid probe  
Ø3.3 x 130 mm (160-222)



## optional accessory

- protective silicone boot - the Precision/Precision Plus thermometers are splashproof to IP64 when used in conjunction with this boot. Various colours are available - see page 13



order code	description
222-053	Precision thermometer
222-051	Precision Plus thermometer
160-222	PT100 1/10th DIN liquid probe
830-221	protective silicone boot - white
832-050	s/steel wall bracket & boot

222-053 Precision is exclusive of probe  
222-051 Precision Plus is inclusive of probe

specification	Precision	Precision Plus
range	-199.9 to 499.9 °C	-199.99 to 199.99 °C
resolution	0.1 °C	0.01 °C
accuracy	$\pm 0.2$ °C	$\pm 0.05$ °C
battery & life	3 x 1.5 volt AAA - 2000 hours	
sensor type	PT100	
display	10 mm LCD	
dimensions	25 x 56 x 128 mm	
weight	130 grams	

222-053 Precision includes a traceable certificate of calibration  
222-051 Precision Plus includes a UKAS Certificate of Calibration

# Thermapen<sup>®</sup> 3 Thermometer

## with air, surface or penetration probe

- temperature range -49.9 to 299.9 °C
- lightweight, compact & easy to use
- foldaway stainless steel probe
- one-handed operation

The Thermapen 3 thermometer incorporates a large digital display with a precise read-out over the range of -49.9 to 299.9 °C with a 0.1 °C resolution and an accuracy of ±0.4 °C. The resolution can be switched to 1 °C, if required, via a switch in the battery compartment. 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 also displayed, when applicable. Each Thermapen 3 is powered by two lithium coin cell batteries with a minimum life expectancy of 1500 hours.

The probe conveniently folds back through 180° into the side of the instrument when not in use. The casing is washable and includes 'Biomaster' additive that reduces bacteria growth and the ergonomic rubber seal minimises the risk of the ingress of water, dust or food.

### choice of probe styles

The Thermapen 3 is available with three styles of probe; surface, air or penetration. The fast response air probe is an invaluable tool in establishing the correct air temperature quickly in HVAC and laboratory applications. The surface probe is particularly useful in determining the temperature of hot plates or pipes etc. **Please note:** the accuracy and speed of response will be dependant on whether the surface is flat and heat transfer compound is used.

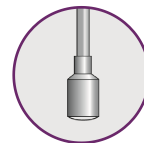
### optional accessories

- stainless steel wall bracket - screws not supplied (832-002)
- protective PVC wallet with belt strap (830-110)
- protective silicone boot (830-260)
- glow in the dark protective silicone boot with magnets (830-265)



order code	description
231-210	Thermapen 3 - penetration probe
231-212	Thermapen 3 - surface probe
231-214	Thermapen 3 - air probe
830-260	protective silicone boot
830-265	silicone boot - glow in dark
830-110	protective wallet
832-002	s/steel wall bracket

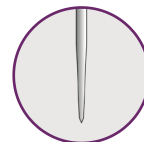
the Thermapen 3 is supplied in a zip pouch (830-001)



### waterproof ribbon surface probe

Ø8 x 95 mm

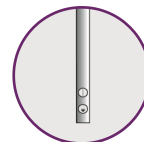
This waterproof probe is ideal for measuring the surface temperature of pipes, bearings, hotplates and other flat surfaces.



### penetration probe

Ø3.3 x 108 mm

This strong and versatile probe incorporates a pointed, general purpose tip, ideal for insertion into liquids and semi-solids.



### air or gas probe

Ø3.3 x 95 mm

This fast response air or gas probe is ideal for measuring the air temperature in offices, HVAC applications, laboratories and other temperature sensitive working areas.



specification	Thermapen 3
range	-49.9 to 299.9 °C
resolution	0.1 °C or 1 °C - user selectable
accuracy	±0.4 °C (-49.9 to 199.9 °C) or ±1 °C
battery	2 x 3 volt CR2032 lithium coin cell
battery life	1500 hours
sensor type	K thermocouple
display	14.5 mm LCD
dimensions	19 x 47 x 153 mm
weight	97 grams

FREE traceable certificate of calibration included