

Industrial thermometers

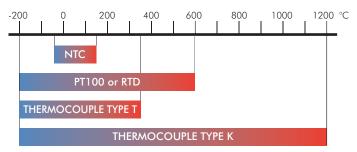


Selecting the correct thermometer for an application is by definition very important, to achieve the maximum accuracy and repeatability of the temperature reading.

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

ETI digital thermometers utilise one of three types of temperature sensors, thermocouple, NTC thermistor and resistance temperature detectors (RTD or PT100). 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 (PT100 or RTD) 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.

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NEW!

Therma 1, 3 & Elite Thermometers

with interchangeable thermocouple probes

- ✓ FREE traceable certificate of calibration included
- ✓ Elite model with max/min & a backlight
- ✓ wide temperature measurement range
- ✓ minimum five-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 1370 $^{\circ}$ C with a 0.1 $^{\circ}$ C or 1 $^{\circ}$ C resolution. The thermometers are housed in a robust ABS case that contains 'Biomaster' additive that helps to reduce bacterial growth.

The Therma 1 and 3 feature a large, easy to read, LCD display with open circuit 'Err' and low battery indication. Each thermometer is powered by three 1.5 volt AAA batteries that gives 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 required.

ETI offers an extensive range of interchangeable type K thermocouple probes, for a variety of different applications, see pages 49 to 54 for full details.



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 (± 2 °C) which allows users to compensate for thermocouple probe errors.

optional accessories

- 830-251 protective silicone boot the Therma series is waterproof to IP63 when used in conjunction with this protective boot
- 832-050 wall bracket (screws not supplied) and protective silicone boot



order	code	desc	ription
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221-041	Therma 1
221-043	Therma 3
221-061	Therma Elite
830-251	protective silicone boot
832-050	wall bracket & protective boot
the TI	herma series is exclusive of probe











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	±0.4 °C ±0.1 %	±1 °C ±0.1 %
battery	3 x 1.5 volt	AAA
battery life	minimum 5 years (10000 hours)
sensor type	K thermoco	ouple
display	12 mm L	CD
dimensions	25 x 56 x 12	28 mm
weight	130 grai	ms
FREE tro	aceable certificate of call	ibration included



2202 & 2203 Thermometers T1 or T2 temperature or T1 minus T2 differential

- ideal for radiator balancing or HVAC applications
- FREE traceable certificate of calibration
- two models 0.1 °C or 1 °C resolution
- two-input sockets

The differential digital thermometers allow the user to use 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 to be measured.

The thermometers measure temperature over the range of -50 to 550 °C with a 1 °C resolution or -49.9 to 199.9 °C with a 0.1 °C resolution. Both thermometers feature a custom, LCD display with °C, T1, T2, diff, hold, open circuit and low battery indication. The units incorporate an auto-power off facility that automatically turns the instrument off after approximately three minutes, maximising battery life.

Both the 2202 and 2203 incorporate easy to use, silicone rubber key switches which activate the various functions of each instrument. Conveniently located are the front-mounted thermocouple probe sockets that allow a wide range of interchangeable thermocouple type K probes to be connected to the instrument. For full details of the range of thermocouple probes available, see pages 49 to 54.

optional accessories





- 832-115 wall bracket (screws not supplied)
- three-point temperature checker (page 82)

order code	description
221-222	2202
221-233	2203
830-205	protective boot
832-115	wall bracket
the theri	mometers are exclusive of probe





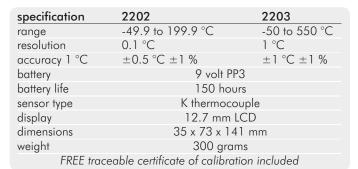
2202













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HVAC Thermometer Kits

excellent value for money - FREE carrying case

These thermometer kits are designed for specific industrial applications. For a full specification on each thermometer see pages 37 and 38. These kits represent excellent value for money as they are supplied in a FREE carrying case.

HVAC thermometer kit 0.1 °C

Each kit contains

1 x 221-222 ETI 2202 thermometer

1 x 123-160 penetration probe

2 x 133-040 pipe clamp probes

1 x 834-300 ABS carrying case

HVAC thermometer kit 1 °C

Each kit contains

1 x 221-233 ETI 2203 thermometer

1 x 123-160 penetration probe

2 x 133-040 pipe clamp probes

1 x 834-300 ABS carrying case

order code description

860-070 HVAC kit 0.1 °C 860-080 HVAC kit 1 °C

FREE traceable certificate of calibration included



Legionnaires' Thermometer Kit





Incorrect water temperature is a key risk factor for legionella growth. The legionella bacteria multiply in water at temperatures between 20 to 45 °C, particularly if a supply of nutrients is present, such as scale, rust, sludge or algae. A typical method of control is to store cold water below 20 °C. Hot water should be stored above 60 °C and distributed at above 50 °C.

Legionnaires' kit 1 °C

Each kit contains

1 x 221-041 Therma 1 thermometer

1 x 123-160 penetration probe

1 x 123-030 precision ribbon surface probe

1 x 133-362 PTFE wire probe

1 x 806-150 count up/down timer

1 x 836-022 mini tub of 70 ProbeWipes

1 x 834-150 ABS carrying case

order code description

860-860 legionnaires' thermometer kit FREE traceable certificate of calibration included



Precision PT100 Thermometers

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

- ✓ high accuracy ± 0.2 °C or 0.05 °C
- max/min memory function
- interchangeable PT100 probes
- FREE certificate of calibration included

High accuracy is one of the outstanding 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 ± 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 ± 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 1.5 volt AAA batteries that gives a minimum of 2000 hours battery life. The units will power off automatically after ten minutes, maximising battery life. This feature can be disabled by the user, if required.

ETI offers a range of interchangeable PT100 Class A probes for use with the Precision thermometer, see page 56 for full details. The Precision Plus is supplied with a 160-222 PT100 1/10th DIN liquid probe and a UKAS Certificate of Calibration.

For regularly checking the accuracy of each Precision thermometer, a range of calibration test caps complete with a UKAS Certificate of Calibration are available, see page 82.

optional accessories

- 830-251 protective silicone boot the Precision thermometers are waterproof to IP63 when used in conjunction with this protective boot
- 832-050 wall bracket (screws not supplied) and protective silicone boot
- calibration test caps, see page 82

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order code	description
222-053	Precision thermometer
222-051	Precision Plus thermometer
830-251	protective silicone boot
832-050	wall bracket & protective boot
222-05	33 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	±0.2 °C	±0.05 °C
battery	3 x 1.5 vol	t AAA
battery life	2000 ho	ours
sensor type	PT100	
display	10 mm L	CD
dimensions	25 x 56 x 12	28 mm
weight	130 gra	ms
222-053 Precisio	on includes FRFF traceah	le certificate of calibration

222-051 Precision Plus includes UKAS Certificate of Calibration

Reference Thermometer

±0.05 °C high system accuracy



- ✓ range -199.99 to 199.99 °C
- 5-point UKAS Certificate included
- ✓ ideal for calibration comparison checks
- ✓ supplied complete with high accuracy probe

The Reference thermometer is a high accuracy PT100 instrument that is supplied with a 5-point UKAS Certificate of Calibration. Each certificate indicates deviations from standards at various check points: -18, 0, 40, 70 and 100 °C. Special ranges may be certified by arrangement with the ETI UKAS calibration laboratory.

The Reference thermometer is ideal for comparison checking the calibration and accuracy of other thermometers and probes, when used in conjunction with a stable temperature heat or chill source, see pages 78 and 79. The instrument and probe measures temperature over the range of -199.99 to 199.99 °C with a resolution of $0.01\,^{\circ}$ C and an accuracy of $\pm 0.05\,^{\circ}$ C. The unit features a simple on/off push button with low battery and open circuit 'Err' and low battery indication, when applicable.

The Reference thermometer is 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.



Comparator

The Reference thermometer (above) is being used in conjunction with an infrared thermometer and the Comparator.

order code	description
222-055	Reference
814-132	Comparator



A 5-point UKAS Certificate of Calibration is included with each Reference thermometer









specification	Reference
range	-199.99 to 199.99 °C
resolution	0.01 °C
accuracy	± 0.05 °C (-30 to 150 °C) otherwise ± 0.1 °C
battery	3 x 1.5 volt AAA
battery life	2000 hours
sensor type	PT100 1/10th DIN
display	10 mm LCD
dimensions	25 x 56 x 128 mm
weight	210 grams
a UKA	AS Certificate of Calibration is included

MicroTherma 1 Thermometer

in-built microprocessor for automatic re-calibration

- ✓ 0.1 °C resolution over the full range
- ✓ should never need re-calibrating
- ✓ FREE traceable certificate of calibration
- ✓ type K, J, T, R, N, S or E thermocouple probes

The unit should never need re-calibrating as the built-in microprocessor enables the instrument to continuously and automatically carry out self-diagnostic re-calibration. An additional feature allows the user to adjust the reading ($\pm 2.5\,^{\circ}\text{C}$) 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 or 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 extensive range of thermocouple probes available, see pages 49 to 54.



order code description

221-091 MicroTherma 1 830-205 protective boot 832-115 wall bracket

the MicroTherma 1 is exclusive of probe

optional accessories

- 830-205 protective boot
- 832-115 wall bracket (screws not supplied)













specification	MicroTherma 1
range	-270 to 1768 °C
resolution	0.1 °C/°F
accuracy	± 0.2 °C ± 1 digit
battery	2 x 1.5 volt AAA alkaline
battery life	1000 hours
sensor type	thermocouple type K, J, T, R, N, S & E - selectable
display	12.7 mm LCD
dimensions	35 x 73 x 141 mm
weight	220 grams
FREE t	raceable certificate of calibration included

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MicroTherma 2 Thermometer

in-built microprocessor for automatic re-calibration

- ✓ thermocouple type K, J, T, R, N, S or E available
- ✓ self-diagnostic calibration
- ✓ FREE traceable certificate of calibration
- ✓ max/min memory function

The MicroTherma 2 microprocessor thermometers measure temperature over the range of -270 to 1768 °C with a 0.1 °C/°F resolution over the entire range. Each microprocessor thermometer incorporates an easy to read, multi-function LCD display with open circuit, low battery, hold, max/min and °C/°F indication.

The thermometers should never need re-calibrating as the built-in microprocessor enables the instruments to continuously and automatically carry out self-diagnostic re-calibration. An additional feature allows the user to adjust the reading ($\pm 2.5\,^{\circ}$ C) to offset any probe errors, correcting any inaccuracies of the thermocouple probe. Each thermometer thereafter will automatically store the offset and adjust the instrument for the known probe error, maximising accuracy.



Seven models are available that utilise type K, J, T, R, N, S or E thermocouple probes. The instrument also features an auto-power off facility which maximises the battery life, turning the instrument off automatically after 30 minutes. Other selectable parameters include: display contrast and internal CJC temperature reading. For details of the extensive range of thermocouple probes available, see pages 49 to 54.



optional accessories

- 830-205 protective boot
- 832-115 wall bracket (screws not supplied)

order code	description	range	
221-092	MicroTherma 2K	-200 to	1372 °C
227-093	MicroTherma 2T	-270 to	400 °C
229-094	MicroTherma 2J	-200 to	1200 °C
229-095	MicroTherma 2N	-200 to	1300 °C
229-096	MicroTherma 2S	0 to	1768 °C
229-097	MicroTherma 2E	-140 to	1000 °C
229-098	MicroTherma 2R	0 to	1768 °C
830-205	protective boot		
832-115	wall bracket		
the N	NicroTherma 2 serie	es is exclus	sive of probe

specification	MicroTherma 2
range	-270 to 1768 °C (dependent on TC type see above)
resolution	0.1 °C/°F
accuracy	± 0.2 °C ± 1 digit
battery & battery life	2 x 1.5 volt AAA alkaline - 1000 hours
sensor type	thermocouple type K, J, T, R, N, S or E
display	12.7 mm LCD
dimensions	35 x 73 x 141 mm
weight	220 grams
FREE to	raceable certificate of calibration included















MiniTherma™ K

thermocouple thermometer

- ✓ interchangeable type K thermocouple probes
- ✓ water resistant offering IP65 protection

The MiniTherma K thermometer is designed for versatility and ease of use. The instrument accepts a miniature type K thermocouple plug that enables a variety of interchangeable probes to be used. The thermometer incorporates a clear digital display with a precise read-out of temperature over the range of -59.9 to 1399 °C with a 0.1 °C resolution between -59.9 to 199.9 °C thereafter 1 °C.

The unit features a display hold function and both low battery and open circuit indication are also displayed, when applicable. An auto-power off facility turns the instrument off after four minutes, maximising battery life.

The MiniTherma K is lightweight, at less than 40 grams. The case is manufactured from high impact ABS plastic designed to cope with routine day-to-day applications. Each MiniTherma K is supplied with a FREE OF CHARGE hand held penetration probe (133-988, as illustrated) and battery.

order code	description
810-998	MiniTherma K



specification	MiniTherma K
range	-59.9 to 1399 °C
resolution	0.1 °C (1 °C above 199.9 °C)
accuracy	\pm 1 % or \pm 1 °C over the full range
battery	3 volt CR2032 lithium coin cell
battery life	100 hours
sensor type	K thermocouple
display	11 mm LCD
dimensions	19 x 40 x 76 mm
weight	36 grams











plug-mounted probes

These plug-mounted probes are mounted directly into miniature type K thermocouple plugs. This provides an economical solution to many temperature measuring applications and allows the option of one-handed operation.

		order code	
penetration probe Ø3.3 x 120 mm	This plug-mounted, stainless steel, penetration probe is strong and versatile. Ideal for a variety of applications i.e. liquids or semi-solids. Response time less than three seconds. Maximum tip temperature 250 °C.	133-161	
fast response probe Ø1 mm tip x 90 mm	This plug-mounted, fast-response, penetration probe is designed for measuring the temperature of soft substances and liquids. Response time less than one second. Maximum tip temperature 250 °C.	133-151	
air or gas probe	This plug-mounted air/gas probe has a perforated stainless steel tip for fast response. Ideal for measuring the temperature of air conditioning. Response time less than one second. Maximum tip temperature 250 °C.	133-301	
ribbon surface probe Ø8 x 120 mm	This plug-mounted stainless steel surface probe is ideal for measuring metallic surfaces. A right-angled version is also available, order code 133-046. Response time less than one second. Maximum tip temperature 250 °C.	133-045	
FEP (plastic) probe Ø3.2 x 40 mm	This FEP (plastic) penetration probe, for measuring food temperatures, was originally designed for airlines where safety is paramount. Response time less than three seconds. Maximum tip temperature 250 °C.	133-155	

Thermapen™ Thermometer

with air, surface or penetration probe

- ✓ one-handed operation
- ✓ auto-power on/off facility
- foldaway stainless steel probe
- lightweight, compact & easy to use

The Thermapen 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 is powered by two lithium coin cell batteries with a minimum life expectancy of 1500 hours.

The Thermapen thermometer probe, conveniently folds back through 180 degrees 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 thermometer is also available with three alternative styles of probe; surface, air or penetration. The fast response air probe is an invaluable tool in establishing the correct air temperature guickly in HVAC and laboratory applications. The surface probe is particularly useful in determining the temperature of hot plates or pipe temperatures etc. Please note the accuracy and speed of response will be dependant on whether the surface is flat and heat transfer compound is used.

penetration probe

This strong, versatile penetration probe with a pointed, general purpose tip is suitable for liquid and semi-solid insertion.



surface probe

This ribbon surface probe is ideal for measuring the temperature of a variety of flat surfaces, i.e. hotplates, pipework, bearings, etc.



air probe

This fast response air probe is ideal for measuring the air temperature in laboratories and other temperature sensitive working areas.

Ø3.3 x 95 mm







oraer coa	e description
231-210	white Thermapen - penetration probe
231-212	white Thermapen - surface probe
231-214	white Thermapen - air probe
830-260	protective silicone boot

830-110	protective wallet
830-001	zip pouch
832-200	wall bracket

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specification	Thermapen
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	14.3 mm LCD
dimensions	19 x 47 x 153 mm
weight	97 grams
FREE traced	able certificate of calibration included

email

Bi-Metal Dial Thermometers

simple to use



These pocket-sized dial thermometers feature either a $\varnothing 25$ mm or $\varnothing 45$ mm dial with a pointed $\varnothing 4$ x 130 mm stainless steel stem and are supplied with a probe cover. Each dial thermometer is available in three scales. A stainless steel mounting clip is available.

order code	description	range	
800-811	Ø25 mm dial	-40 to 70	°C
800-812	Ø25 mm dial	-10 to 110	°C
800-813	Ø25 mm dial	0 to 250	°C
800-801	Ø45 mm dial	-40 to 70	°C
800-802	Ø45 mm dial	-10 to 110	°C
800-803	Ø45 mm dial	0 to 250	°C
830-220	Ø4 mm probe	holder clip	

milk frothing dial thermometers



The milk frothing dial thermometers incorporate colour-coded zones that make them fast and simple to use. Available with Ø25 mm dial x 130 mm probe or Ø45 mm dial x 130 or 175 mm probe. Each thermometer is supplied with a stainless steel jug mounting probe clip.

order code	description
800-810	Ø25 x 130 mm milk dial
800-820	Ø45 x 130 mm milk dial
800-800	Ø45 x 175 mm milk dial

waterproof dial thermometers



These waterproof dial thermometers feature a \emptyset 45 mm dial with 130 mm stem and indicate temperature over the range of -10 to 110 °C.

The dial face has a clear, graduated scale indicating temperature in 1 °C divisions.

The thermometer is supplied with a green or red silicone boot that helps protect the instrument against accidental damage.

order code	description
800-833	waterproof dial - green boot
800-834	waterproof dial - red boot

heavy duty dial probe thermometers



These simple to use, heavy duty, 50 mm diameter dial probe thermometers are reliable and accurate. The dial thermometers feature a \emptyset 6.35 x 300 mm pointed stainless steel stem. Ideal for asphalt, blacktop, soil and other heavy duty applications.

Each thermometer incorporates a clear acrylic face and a calibration adjustment screw, at rear of the dial. Three temperature scales are available.

order code	description	range
800-060	dial thermometer	-20 to 60 °C
800-120	dial thermometer	0 to 120 °C
800-250	dial thermometer	0 to 250 °C

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Bi-Metal Dial Thermometers

ideal for the HVAC industry

pipe surface thermometer



This easy to use surface pipe thermometer features a \varnothing 60 mm stainless steel dial and indicates temperature over the range of 0 to 120 °C or 32 to 250 °F. The \varnothing 50 mm dial face has a clear, graduated scale indicating temperature in 2 °C and 4 °F divisions.

Each thermometer is supplied with a wrap-around stainless steel spring kit (53 mm long) for pipe mounting. For larger pipes it is possible to attach the thermometer to pipework using either tie-wraps or wire (not supplied).

order code	description
800-951	pipe thermometer

budget pipe surface thermometer



This easy to use surface pipe thermometer features a Ø60 mm nickel plated dial and indicates temperature over the range of 0 to 120 °C.

The $\varnothing 50$ mm dial face has a clear, graduated scale indicating temperature in 2 °C divisions.

Each thermometer is supplied with a wrap-around spring kit (53 mm long) for pipe mounting. For larger pipes it is possible to attach the thermometer to pipework using either tie-wraps or wire (not supplied).

order code	description
800-971	pipe thermometer

magnetic surface thermometer



This \varnothing 60 mm stainless steel surface dial thermometer incorporates a magnetic sensing pad for mounting on ferrous metals and indicates temperature ranges 0 to 120 °C.

The Ø50 mm dial face has a clear, graduated scale indicating temperature in 2 °C divisions.

order code	description
800-950	magnetic thermometer

hot water dial thermometer



This simple to use $\emptyset 45$ mm dial probe thermometer is reliable and accurate. The hot water dial thermometer features a $\emptyset 4 \times 300$ mm pointed stainless steel stem. The thermometer indicates temperature over the range of -40 to 70 °C in 2 °C divisions.

The dial thermometer is ideal for measuring water temperatures and semi-solid materials in a wide variety of industrial applications. Each thermometer is supplied with a stainless steel mounting probe clip that can be attached to the side of a water container or similar.

order code	description
800-990	Ø45 mm dial thermometer