Non-contact temperature measurement with infrared technology

On the next pages you will find various infrared thermometers for non-contact surface temperature measurements. The infrared thermometers are suitable for measurements wherever direct contact is impossible or impractical.

Applications

- Surface temperature measurement
- Core temperature measurement with penetration probe
- Process monitoring

Find your perfect infrared thermometer:

Infrared Thermometers	Measurement range	Probe type	Probe connection	Channels	Distance:spot ratio	Fast response time	Splashproof housing
TFI 650 Infrared Dual Thermometer	-60 °C … +1,500 °C	Infrared and Thermoelement Typ K	SMP	2	50:1	✗ (Infrared)	
TFI 550 Infrared Dual Thermometer	-60 °C … +550 °C	Infrared and Thermoelement Typ K	SMP	2	30:1	✗ (Infrared)	
TFI 260 Basic Infrared Thermometer	-60 °C … +550 °C	Infrared		1	12:1	✗	
TFI 54 Infrared Thermometer	-60 °C … +550 °C	Infrared		1	12:1	✗	✗
TLC 750i Dual Infrared/Fold-Back Thermometer	-50 °C … +250 °C	Infrared and Thermocouple Type T		2	8:1	✗ (Infrared)	✗

TFI 650 Infrared Dual Thermometer
with wide measurement range and connection for thermo elements type K

Optional external NiCr-Ni probes with SMP connection available (starting on page 73).

- Double laser pointer
- Distance:spot ratio = 50:1
- Alarm when MIN/MAX exceeded

Technical Data

Measurement range	-60 °C ... +1,500 °C (-76 °F ... +2,732 °F)
Accuracy	±2% of measurement value / ±2 °C (whichever is larger)
Resolution	0.1 °C
Response time	Approximately 1 sec
Emissivity factor	0.1 ... 1.0
Distance:spot ratio	50:1
Probe	With SMP connection
Operating temperature	0 °C ... +50 °C
Storage temperature	-20 °C ... +65 °C
Housing material	ABS
Protection class	IP20
Battery	2 x AAA (Micro)
Battery lifetime	Typically 140 hours
Dimensions (L x W x H)	47 x 197 x 203.3 mm
Weight	Approximately 385 g (with battery)
Certificate	Factory calibration certificate (-30 °C, 0 °C and +200 °C)

Type	Description	Part No.
TFI 650	Infrared Thermometer with NiCr-Ni connection	1340-1783A
AN 144	Extension cable, 2.5 m silicone, SMP	1343-2627

TFI 550 Infrared Dual Thermometer
with connection for thermo elements type K

Optional external NiCr-Ni probes with SMP connection available (starting on page 73).

- Double laser pointer
- Distance:spot ratio = 30:1
- Alarm when MIN/MAX exceeded

Technical Data

Measurement range	-60 °C ... +550 °C (-76 °F ... +1,022 °F)
Accuracy	±2 °C at -18 °C ... +23 °C (±3.6 °F at 0 °F ... +73 °F) ±1 % of measurement ±1 °C (whichever is larger) at +23 °C ... +510 °C ±1.8 °F (whichever is larger) at 73 °F ... +950 °F
Resolution	0.1 °C at -9.9 °C ... +199 °C, otherwise +1 °C (+0.2 °F at +14 °F ... +391 °F, otherwise +1.8 °F)
Response time (t_{99})	Approximately 1 s
Emissivity factor	0.1 ... 1.0
Distance : spot ratio	30:1
NiCr-Ni probe measurement	
Measurement range	-64 °C ... +1,400 °C (-83 °F ... +2,552 °F)
Connection	SMP
Accuracy	±1 % of measurement value / ±1 °C (±1.8 °F), whichever is larger
Battery	2 x AAA (Micro)
Battery lifetime	Typically 180 hours
Operating temperature	0 °C ... +50 °C (+32 °F ... +122 °F)
Storage temperature	-20° C ... +65 °C (-4 °F ... +149 °F)
Housing material	ABS
Protection class	IP20
Weight	Approximately 180 g
Certificate	Factory calibration certificate (Infrared: -18 °C, 0°C and +120 °C; NiCr-Ni: -20 °C, 0 °C and +1,000 °C)

Type	Description	Part No.
TFI 550	Infrared thermometer with NiCr-Ni connection	1340-1786A
AN 144	Extension cable, 2.5 m silicone, SMP	1343-2627

TFI 260 Basic Infrared Thermometer *with circular laserpointer*

- Measurement area perfectly marked due to circular laserpointer
- Bright display backlight
- Distance: spot ratio = 12:1

Technical Data

Measurement range	-60 °C ... +550 °C (-76 °F... +1,022 °F)
Accuracy	±2 °C +0.05 °C per °C below 0 °C (at -60 °C … 0 °C) ±2 °C (at 0 °C … +15 °C) ±1.5 °C (at +15 °C … +35 °C) ±2 °C or 2%, larger value is applicable (at +35 °C … +550 °C)
Resolution	0.1 °
Operating temperature	0 °C … +50 °C (+32 °F ... +122 °F)
Response time	1 s
Emissivity factor	0.95 fixed
Distance : spot ratio	12:1
Battery	2 x AAA (Micro)
Battery lifetime	Approximately 7 hours of continuous use
Housing material	ABS
Dimensions (L x W x H)	115 x 162 x 40 mm
Weight	179 g (with batteries)
Protection class	IP20
Certificate	Factory calibration certificate (0 °C)

Type	Description	Part No.
TFI 260	Infrared thermometer incl. factory calibration	1340-1755A

TFI 54 Infrared Thermometer *with splash proof housing*

- Single laser pointer
- Distance:spot ratio = 12:1
- Replaceable battery

Technical Data

Measurement range	-60 °C ... +550 °C (-76 °F ... +1,022 °F)
Accuracy	±2 °C +0,05 °C per °C below 0 °C (at -60 °C … 0 °C) ±2 °C (at 0 °C … +15 °C) ±1,5 °C (at +15 °C … +35 °C) ±2 °C or 2%, larger value is applicable (at +35 °C … +550 °C)
Resolution	0.1 °C (-9.9 °C ... +199.9 °C) 1 °C for the remaining measurement range
Operating temperature	0 °C … +50 °C (+32 °F ... +122 °F)
Response time	1 s
Emissivity factor	0.95 standard, adjustable from 0.1 to 1.0
Distance : spot ratio	12:1
Battery	2 x AAA (Micro)
Battery life time	Approximately 14 hours of continuous use
Housing material	Rubberized
Dimensions (L x W x H)	144 x 117 x 43 mm
Weight	180 g (with batteries)
Protection class	IP54
Certificate	Factory calibration certificate (0 °C)

Type	Description	Part No.
TFI 54	Infrared Thermometer including factory calibration certificate	1340-1754A

TLC 750i Dual Infrared/Fold-Back Thermometer
with foldable penetration probe and infrared sensor

- Display with backlight for reading in dark environments
- Display can be upside down for reading from both sides
- Double laser pointer

Technical Data

Measurement range	-50 °C ... +250 °C (-58 °F ... +482 °F)
Accuracy infrared	±4 °C at -50 °C ... -30.1 °C (±7.2 °F at -58 °F ... -22 °F) ±2.5 °C at -30 °C ... -18.1 °C (±4.5 °F at -22 °F ... -0.4 °F) ±1.5 °C at -18 °C ... -0.1 °C (±2.7 °F at -0.4 °F ... +32 °F) ±1.0 °C at 0 °C ... +65 °C (±1.8 °F at +32 °F ... +149 °F) ±2.0 °C or 2 % at +65 °C ... +250 °C (±3.6 °F at +149 °F ... +482 °F)
Accuracy penetration probe	±0.5 °C at -30 °C ... +99.9 °C (±0.9 °F at -22 °F ... +212 °F) ±1 °C (±2 °F) or 1 % for the remaining measurement range (whichever is larger)
Resolution	0.1 °C / 0.2 °F
Distance : Spot ratio	8:1
Sensor	Thermocouple type T
Operating temperature	-25 °C ... +50 °C (-13 °F ... +122 °F)
Storage temperature	-30 °C ... +70 °C (-40 °F ... +158 °F)
Battery	2 x AAA (Micro), user replaceable
Battery lifetime	Approximately 10 h of continuous use
Dimensions (L x W x H)	169.5 x 44x23 mm (without probe), needle length = 100 mm
Housing material	ABS
Weight	Approximately 140 g
Protection class	IP65
Automatic deactivation	Automatically after 15 seconds, deactivatable
Certificate	Factory calibration certificate (-18 °C and 0 °C)

Type	Description	Part No.
TLC 750i	Dual Infrared / Fold-Back Thermometer	1340-5736A

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Recommendations for Infrared Measurements

Infrared Radiation Properties of Various Materials

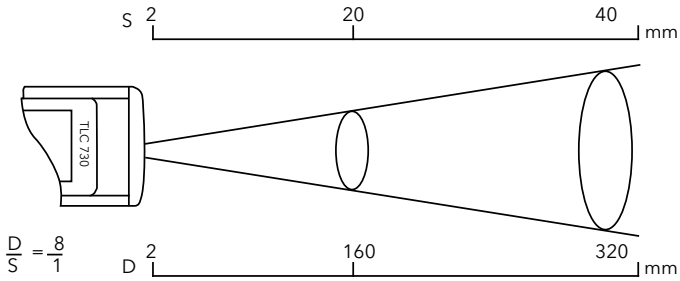
Various materials and surfaces have different infrared light emitting properties and therefore affect the temperature data being measured (emissivity). Most common products (including liquids and foodstuffs packaged in cartons or plastic containers) have an emissivity of 0.95.

Bare or metallic surfaces cause inaccurate measurements due to their reflectivity of light and heat radiation. It is possible to circumvent these problems by measuring parts of the object you are measuring that are already black (e.g. for a grill) or by painting the surface of the respective object black or by covering with matt tape. After covering the object, wait some time before performing the measurement to ensure that the material used for covering can acquire the temperature of the object being measured.

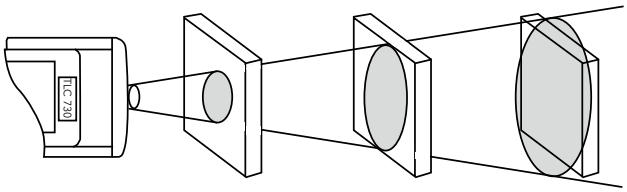
Our thermometers have a factory set emissivity of 0.95. The emissivity value can be set within a range of 0.10 (value shown on display: 10E) and 1 (display: 100E).

Tips for Precise Infrared Measurements

As the distance between the thermometer and the object being measured increases, so does the diameter of the surface being measured (spot size). You can observe this because the distance between the two red laser points projected on the measured object increases as the distance between the thermometer and the measured object increases. The ideal measuring distance is between 5 cm and 10 cm.



Please ensure that the object being measured is larger than the distance between the two laser points. The smaller the measured object is, the closer you must be to the object.



If the accuracy of the measurement is crucial, the object being measured should be at least twice as large as the distance between the two laser points. The device is not well-suited for taking temperature measurements on shiny or highly polished metallic surfaces (e.g. stainless steel, aluminum etc.). The device cannot take measurements through transparent surfaces such as glass. The device will instead measure the surface temperature of the glass. Steam, dust, smoke and other obstructions can interfere with measuring the correct temperature. If you would like to measure liquids, stir up the liquid thoroughly while taking the measurement.

Table of certain known emissivities

Material Emissivity	Emission 8–14 µm
Aluminium, oxidised	0.2 - 0.4
Aluminium, blank	0.04
Lead, scraggly	0.4
Lead, oxidised	0.2 - 0.6
Iron, oxidised	0.5 - 0.9
Iron, polished	0.24
Iron, rusted	0.5 - 0.7
Copper, polished	0.03
Copper, oxidised	0.4 - 0.8
Inconel, oxidised	0.7 - 0.95
Inconel, polished	0.3 - 0.6
Asphalt	0.95
Concrete	0.95
Ice	0.98
Cement	0.8 - 0.95
Glass pane	0.85
Rubber	0.95
Limestone	0.98
Wood	0.9 - 0.95
Cork	0.7
Graphite	0.7 - 0.8
Ceramics	0.95
Gravel	0.95
Paper	0.95
Cloth	0.95
Sand	0.9
Snow	0.9
Potter's clay	0.95
Water	0.93