Infrared Hand-Held Thermometers

Model: TIR-H...

- Measuring range from
  -20 ... 500 °C to -32 ... 900 °C
- Measuring accuracy:
  ±1 % to ±2 % of measured value
- Option: analogue output,
  RS 232, data memory, laser
  aiming light, statistical functions
- Non-contact measurement
- Simple operation

Model:
TIR-H...

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Application

The series TIR infrared measuring instruments measure the surface temperature of the most varied materials and liquids in seconds in a non-contacting and non-interacting way.

Due to state-of-the-art microprocessor technology, the devices are compact and easy to operate. The measuring position is targeted with a laser pointer or an optical sight, the trigger is pressed and the measurement result is read on a large display.


Advantages

● Unbeatable accuracy

● Non-contact measurement, thus
  short measuring time and no frictional heat

● Safe operation, because of distance
  from danger zone

● Isolated measuring by utilizing infrared radiation,
  also on surfaces that are bad conductors of heat.

● Measurements at places that
  are difficult to access

● Measurements on rotating and moving objects

● Long-term stable, zero-drift measurements

● Maintenance-free

● keine Thermoausgleichsleitungen nötig

Method of operation

The non-contact temperature measurement is based on the physical effect that every physical object emits electromagnetic radiation when heated. The radiated energy and its characteristic wavelength depends on the temperature of the surface of the target.
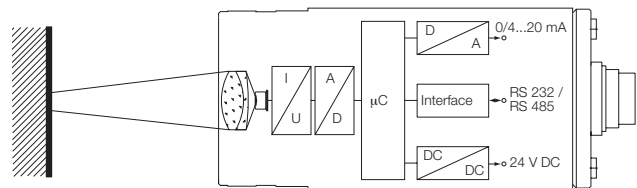
The heat radiation can be seen with the naked eye above approximately 550 °C. The target is then said to glow. Radiation below the light spectrum of red light is called infrared radiation.

Infrared measuring systems are able to concentrate infrared radiation with a suitable system of lens and to convert it to electrical signals. The microprocessor receives the radiation characteristics of the target in the form of emittance. The microprocessor outputs the measured value in digital form to the display or converts it to an analogue signal.

Design

Due to the rapid pace of technological development, highly sensitive and stable infrared detectors are available, with which low temperatures (even well below freezing) can be determined by non-contacting means.

The downstream microprocessor-based electronics linearizes the electrical signals and mathematically compensated for material and surface-dependant influences with the set emittance.

Device programme

Battery-powered hand-held devices

● Model TIR-HN
  - 20 ... +500 °C to - 30 ... +900 °C
  emittance 0.10 to 1.0 (adjustable)
  Options: laser, RS 232, data memory
  statistical functions

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Technical Details TIR-HN040.../050.../060

Accuracy
(with Tu=23°C, ε=100 %):
TIR-HN040:	2 % of measured value or 2 °C
TIR-HN050/...060:	1 % of measured value or 1 °C

Repeatability:
TIR-HN040:	1 % of measured value or 1 °C
TIR-HN050/...060:	0.5 % of measured value or 1 °C
Response time (t90):	300 ms
Emittance:	20...100 % (TIR-HN050, TIR-HN060) 95 % (fix by TIR-HN040)
Display illumination:	automatic
Display resolution:	1 °C
Temperature indication:	3 digits, °C/°F switchable (TIR-HN040: °C or °F preset ex works)
Operating temperature	0 ... 55 °C
Storage temperature	-20 ... 70 °C
Supply:	battery 9 V Block
Battery life:	approx. 80 h / 25 h (with/without laser)
Math. functions:	MAX, MIN, AVG switchable MAX with TIR-HN040
Hold function:	10 s
Measuring dot marking:	laser aiming light laser category 2
Protection type:	IP 20
Case material	ABS, UL-category V0
Dimensions of housing:	205 x 130 x 45 mm (H x L x W)
Tripod thread:	UNC ¼"
Weight:	340 g (with battery)

Description

The TIR Infrared hand-held thermometers are universal measuring instruments for non-contact temperature measurement. They are remarkable for the following special features:

● Convenient one-hand operation and display with pistol grip
● Ergonomic design
● Large multifunction display
● Laser aiming light for marking measuring dot (optional)
● Many computer functions
● Automatic display illumination
● Adjustable emittance
● Locking switch for continuous mode

Applications:

● Plastics	● Liquids	● Glass
● Rubber	● Paints	● Food
● Paper	● Asphalt	● **No bright metal**
● Textiles	● Wood	

Order Details (Example: **TIR-HN 040 D L0**)

Model	Measuring range / Description	Relation of distance	Fittings	Infrared detector
TIR-HN040...*	-32...+400 °C, carrying case included	**..D..** = 1 : 10; Ø 20 mm		Thermopile Spectral range: 8 - 14 µm (no influence of steam and CO_2)
TIR-HN050...	-32...+500 °C, carrying case included	**..G..** = 1 : 15; Ø 8 mm	**L0** = with laser	
TIR-HN060...	-32...+600 °C, carrying case included	**..H..** = 1 : 30; Ø 15 mm		

*Please specify required until (°C/°F) in writing.

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Infrared Hand-Thermometers for Higher Temperatures and Non-Metallic Surfaces with Data Memory

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Description

The TIR Infrared hand-held thermometers are universal measuring instruments for non-contact temperature measurement. They are remarkable for the following special features:

- Convenient one-hand operation and display with pistol grip
- Ergonomic design
- Large multifunction display
- Laser aiming light for marking measuring dot
- Many computer functions
- Automatic display illumination
- RS232 interface or analogue output
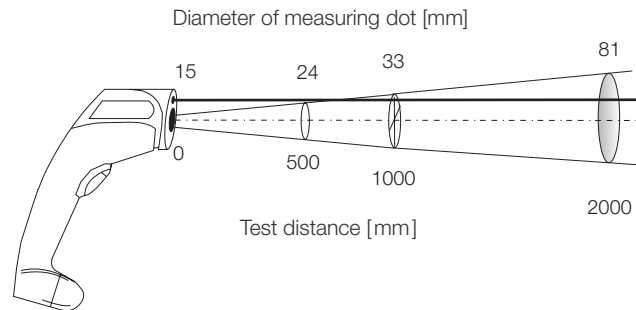- Adjustable emittance

Technical Details TIR-HNR...

Accuracy (with Tu=23°C, ε =100 %):	1 % of measured value or ±1 K ±2 °C for measuring temperature unde -10 °C
Repeatability:	± 0.5 % of meas. value or ±1 K
Temperature coefficient:	± 0.03 %/°C (23 °C)
Response time (t_{90}):	150 ms
Emittance:	20...100 % adjustable
Display illumination:	automatic
Display resolution:	0.1 °C: - 30 °C ... 900 °C 0.1 °F: - 22 °F ... 999.9 °F 1 °F: 1000 °F ... 1652 °F
Temperature indication:	°C/°F switchable 3 digits
Operating temperature:	- 0 ... 55 °C
Storage temperature:	- 20 ... 70 °C
Supply:	battery 9 V block (IEC GLR61)
Math. function:	MAX, MIN, AVG
Hold function:	10 s
Data memory:	250 measured values with all parameters 20 measured values (TIR-HNR 80)
Interface:	RS 232, 9600 BAUD (TIR-HNR 90 only)
Measuring dot marking:	laser aiming light marks the centre of the measuring field, laser category 2
Alarm function:	HI alarm, LO alarm, adjustable
Analogue output:	1 mV/°C or 1 mV/°F (TIR-HNR 90 only)
Charging socket:	for connecting a charger for NC battery (TIR-HNR 90 only)
Battery life:	40 hours without laser
Tripod thread:	UNC ¼"
Protection:	IP 20

Order Details (Example: **TIR-HNR 90 E LR**)

Model	Meas. range / Description	Optics	Fittings	Infrared detector	Applications
TIR-HNR80...	-32...+800 °C Data memory: 20 measuring values, carrying case incl.	**..E** = Optics 1000 mm (1:50) Ø 20 mm standard **..B** = auxiliary optics 100 mm (1:50) Ø 2 mm *(TIR-HNR 90 only)*	**LD** = with laser, Data memory	Thermopile Spectral range: 8 - 14 µm (no influence of steam and CO_2)	Plastics Rubber Paper Textiles Liquids Paints Asphalt Wood, Glass Food **No bright metal**
TIR-HNR90...	-32...+900 °C Data memory: 250 measuring values, RS 232, analogue output, charging socket, integrated clock, carrying case incl.				

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Size of measuring dot for hand-held measuring instruments model TIR-HN040...TIR-HN060

TIR-HN060

Diameter of measuring dot [mm]

81
15   24   33
0
500   1000
2000
Test distance [mm]

The **laser aiming light**
is 20 mm above the
centre of the measuring
dot.

TIR-HN050

Diameter of measuring dot [mm]

140
8   37   66
0
500   1000
2000
Test distance [mm]

TIR-HN040

Diameter of measuring dot [mm]

220
20   68   100
0
600   1000
2000
Test distance [mm]
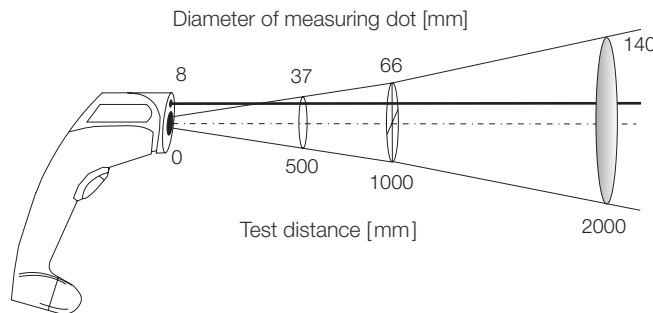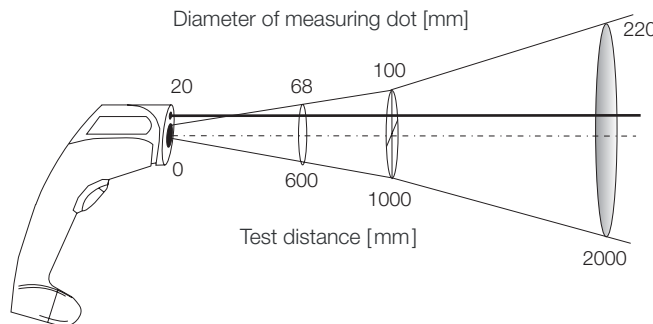
Size of measuring dot for hand-held measuring instruments model TIR-HNR80...TIR-HNR90

Diameter of measuring dot [mm]

20   20   20   60
0
500   1000
2000
Test distance [mm]

With attachment lens

20   47 mm
2,2
0   100
300 mm
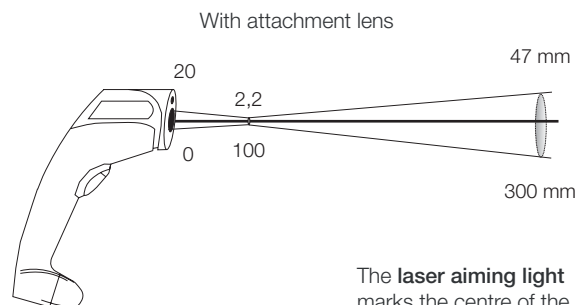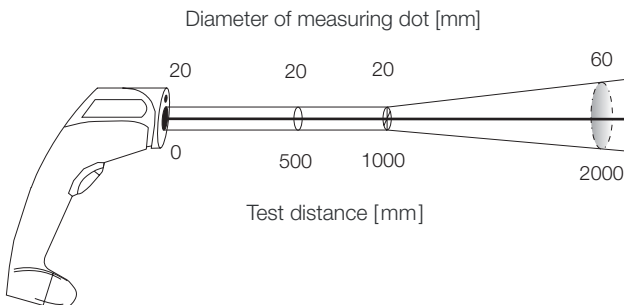
The **laser aiming light**
marks the centre of the
measuring dot.

Accessories for infrared hand-held measuring instruments

TIR-ZH 100	Battery for TIR-HNR 90
TIR-ZH 200	Charger for TIR-HNR 90
TIR-ZH 300	Carrying case for TIR-HN...
TIR-ZH 401	Analogue cable
TIR-ZH 500	Online software model with transmission cable

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