E Instruments International
2013 Test & Measurement Catalog

www.E-Inst.com

P: 215-750-1212   F: 215-750-1399

A: 402 Middletown Blvd, Ste 216   Langhorne, PA 19047

E INSTRUMENTS

Manometers
MP 105 – MP 120

New

CE

■ Functions

- Pressure
- Selection of units
- Manual automatic calibration
- HOLD function
- Minimum and maximum values

- Adjustable automatic shut-off
- Adjustable backlight
- Adjustable climatic parameters *(MP120)*
- Built-in calculation for velocity *(MP120)*

■ Technical features

Measuring element	piezoresistif sensor
Overpressure allowed	
	MP105 : 1.4bar
	MP 120 : 250 mbar
Pressure connectors	MP 120 : Ø 6.2 mm barbed connectors made of nickelled brass
	MP 105 et 112 : Ø 4.6 mm threaded connectors made of nickelled brass
Display	2 lines, LCD technology. Sizes 50 x 34.9 mm.
	1 line of 5 digits with 7 segments (value)
	1 line of 5 digits with 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection
Keypad	Metal-coated with 5 keys
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power supply	1 alkaline battery 9V 6LR61
Operating temperature	from 0 to 50°C
Storage temperature	from -20 to +80°C
Auto shut-off	adjustable from 0 to 120 min
Weight	6.7 oz.
Languages	English, French

MP 100

MP 120 = Manometer + AIR VELOCITY

MP 105 – High Range Manometer

■ Dimensions (mm)

- Top view
- Front view
- Side view

34.7

70.6

50

34.9

156.2

147.7
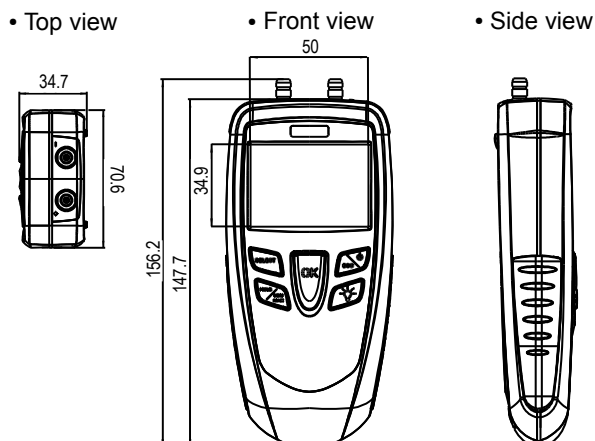
■ Specifications

	Measuring units	Measuring range	Accuracy*	Resolutions
PRESSURE				
MP 105	kPa, inWg, mbar, mmHg, PSI	from 0 to ±200 inH2O (500 mbar)	±0.5% of reading ±0.5 mbar	0.01 inH2O
Pressure + AIR VELOCITY Pitot tube				
MP 120	kPa, inWg, mbar, mmHg, PSI m/s, fpm, Km/h	from 0 to ±4 inH2O (1000 Pa) from 2 to 5 m/s from 5 to 40 m/s	±0.5% of reading ±2 Pa ±0.7 m/s ±0.5% of reading ±0.3 m/s	0.01 inH2O 0.1 m/s

All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.

■ Working principle

Piezoresistif sensor

Piezoresistif sensor is a diaphragm formed on a silicon substrate, which bends with applied pressure and generates millivoltage or millicurrent proportional to the pressure applied.
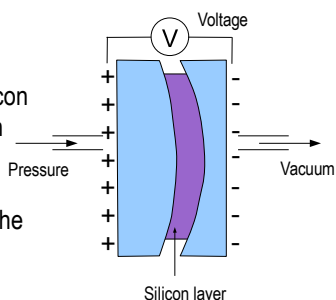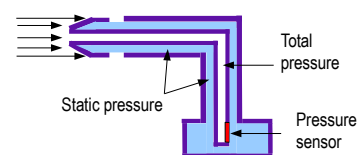
Pitot tube

Dynamic pressure is measured by Pitot tube :
Pd = Total pressure – Static pressure

Velocity is calculated according to Bernoulli simplified formula.

Formula with temperature correction :

$$V_{m/s} = K \times \sqrt{\frac{574,2 \; \theta + 156842,77}{P_0}} \times \sqrt{\Delta P \; en \; Pa}$$

Po = Barometric pressure in Pa
θ = Temperature in °C
K = Pitot tube coefficient

■ Supplied with ...

DESCRIPTION	MP 105	MP 120
Pressure sensor from 0 to ±1000 Pa		●
Pressure sensor from 0 to ±1000 mmH$_2$O		
Pressure sensor from 0 to ±500 mbar	●	
Pressure sensor from 0 to ±2000 mbar		
Pitot tube Ø 6mm, length 300 mm	○	○
2x1 m clear tube Ø 4 x 6 mm	●	○
2x1 m silicone tube Ø 4 x 7 mm	○	●
Stainless steel tip Ø 6 x 100 mm*		●
Calibration certificate	○	○
Transport case	●	●

465 mm
215 mm

● Included
○ Optional

■ Accessories *(See related datasheet)*

CE 100	J.T.C or J.Y.C	See related datasheet
Protective cover with magnet and holding system	Straight connections, in T or Y for tube Ø 5x8mm	Pitot Tube available in many lengths Ø 3/6 or 8mm, with or without temperature compensation

■ Warranty period

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department required for Calibration & repair).
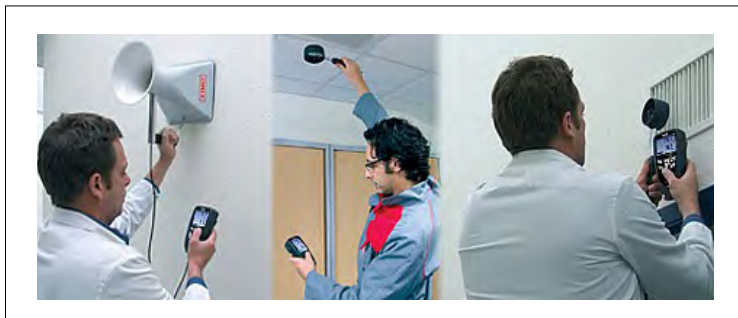
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FTang – MP100 – 120 - 12/08 E – We reserve the right to modify the characteristics of our products without notice.

E INSTRUMENTS

New

Vane Probe Thermo-Anemometers
LV 101 - 107 - 110

CE

Ask about **Calibration** certificate

■ *Functions*

- Air Velocity and Ambient Temperature
- Selection of Units
- HOLD Function
- Minimum and Maximum Values
- Automatic Average

- Airflow Calculation
- Airflow Calculation with Cone
- Adjustable Automatic Shut-off
- Adjustable Backlight
- Detection of Flow direction
- **Automatic CFM Measurements**

■ *Technical features*

Measuring Elements	**Vane Probe Anemometer :**
	LV110 : Hall effect sensor
	Ambient temperature : Pt100 class A
Display	2 lines, LCD technology. Sizes 50 x 34.9 mm.
	1 line of 5 digits with 7 segments (value)
	1 line of 5 digits with 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection
Keypad	Metal-coated with 5 keys
Cable	retractable, length 450 mm, up to 2.4 m when released
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power Supply	1 alkaline battery 9V Included
Operating Temperature (instrument)	from 0 to 122°F
Operating Temperature (probe)	from -4 to +176°F
Storage temperature	from -4 to +176°F
Auto Shut-off	adjustable from 0 to 120 min
Weight	6.7 oz.
Languages	English, French

LV 101 – *Vane probe Ø 14 mm* – *Fixed probe*

331.7 mm
14 mm
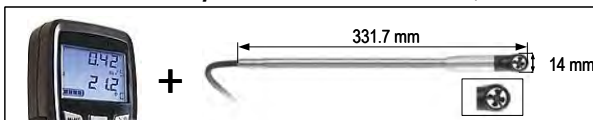
LV 107 – *Vane probe Ø 70 mm* – *Fixed probe*

12 inches
5.5 inches
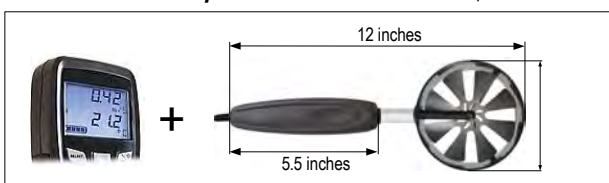
LV 110 - *Vane Probe Ø 100 mm* – *Fixed Probe*

12 inches
5.5 inches
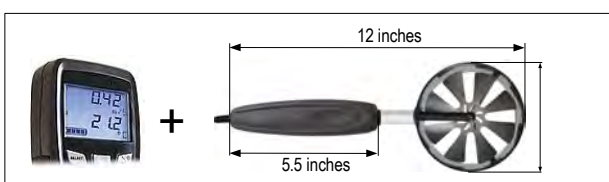
■ Specifications

	Measuring units	Measuring ranges	Accuracy*	Resolutions
AIR VELOCITY				
LV 101 Ø 14 mm	m/s, fpm, Km/h	from 0.8 to 3 m/s from 3.1 to 40 m/s	±3% of reading ±0.1m/s ±1% of reading ±0.3m/s	0.1 m/s
LV 107 Ø 70 mm	m/s, fpm, Km/h	from 0.3 to 3 m/s from 3.1 to 35 m/s	±3% of reading ±0.1m/s ±1% of reading ±0.3m/s	0.1 m/s
LV 110 Ø 100 mm	m/s, fpm, Km/h	from 0.25 to 3 m/s from 3.1 to 35 m/s	±3% of reading ±0.1m/s ±1% of reading ±0.3m/s	0.01 m/s 0.1 m/s
AIR FLOW				
All models	m^3/h, cfm, l/s, m^3/h	from 0 to 99999 m^3/h	±3% of reading ±0.03 *area(cm^2)	1 m^3/h
AMBIENT TEMPERATURE				
All models	°C, °F	from -20 to +80°C	±0.4% of reading ±0.3°C	0.1°C

All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.

■ Working principle

Anemometer : Hall Effect Sensor

Rotation of the shaft of the vane powers a circular magnet of 8 poles. A dual Hall effect sensor, placed next to the magnet senses the signals of magnetic field polarity transition. The sensor signal is converted to electrical frequency and is proportional to the air velocity. Signal chronology allows the detection of rotation direction.
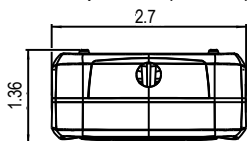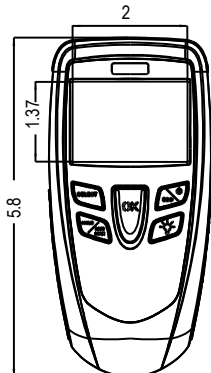

Thermometer : Pt100 probe

Pt100 is a resistance with a positive temperature coefficient which varies according to the temperature. The higher the temperature is, the more the value of the resistance increases. ie : for 0°C ≈ 100 Ш - for 100°C ≈ 138,5 Ш .
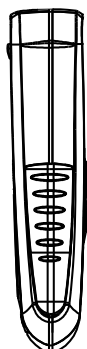
■ Dimensions

• Top View (inches)

• Front View   • Side View

■ Supplied with ...

18 inches
8.5 inches

● Supplied with   ○ Optional

DESCRIPTION	LV 101	LV 107	LV 110
Ø 14 mm vane probe	●		
Ø 70 mm vane probe		●	
Ø 100 mm vane probe			●
Air flow cone K25			○
Air flow cone K35-75-120 or 150	○		
Calibration certificate*	○	○	○
Transport case	●	●	●

■ Accessories (See related datasheet)

| RTS	CE 100
Telescopic extension (for probe), 1m long and bent at 90°	Protective cover with magnet and holding system
RD 300	**K 25**
To be clipped extension for Ø14 mm vane (RD300), Ø 10 mm. length 300 mm (12 inches)	Air flow cone (See related datasheet)

■ Warranty Period

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department for Repair and/or Calibration).
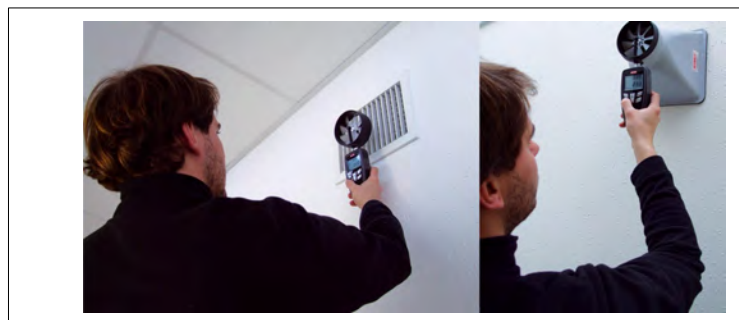
LV120 - LV130

Vane Probe Thermo-Anemometer

ASK ABOUT Calibration certificate

New

CE

■ Functions

- Air velocity and ambient temperature
- Selection of units
- HOLD function
- Minimum and maximum values
- Automatic average

- Airflow calculation
- Airflow calculation with cone
- Adjustable automatic shut-off
- Adjustable backlight
- Detection of flow direction

■ Technical features

Measuring elements	**Vane anemometer :** Hall effect sensor
	Ambient temperature : Pt100 class A
Display	4 lines, LCD technology. Sizes 50 x 34.9 mm.
	2 line of 5 digits with 7 segments (value)
	2 line of 5 digits with 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection
Keypad	Metal-coated with 5 keys
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power supply	1 alcaline battery 9V 6LR61
Operating temperature (instrument)	from 0 to 50°C
Storage temperature	from -20 to +80°C
Auto shut-off	adjustable from 0 to 120 min
Weight	300 g
Languages	French, english

Two (2) Models :

- **LV 130 -** *Ø 100 mm* **MOVING** *Vane probe –* *Fixed and Rotating*
  Vane probe rotation : +180° / -90° increments of 90 °

LV 130

Side view

- **LV 120 -** *Ø 100 mm Vane probe –* *FIXED Vane Head*

■ Specifications

	Measuring units	Measuring ranges	Accuracy*	Resolutions
AIR VELOCITY				
	m/s, fpm, Km/h	from 0.25 to 3 m/s from 3.1 to 35 m/s	±3% of reading ±0.1m/s ±1% of reading ±0.3m/s	0.01 m/s 0.1 m/s
AIR FLOW				
	m^3/h, cfm, l/s, m^3/h	from 0 to 99999 m^3/h	±3% of reading ±0.03 *area(cm²)	1 m^3/h
AMBIENT TEMPERATURE				
	°C, °F	from 0 to +50°C	±0.4% of reading ±0.3°C	0.1°C

All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.

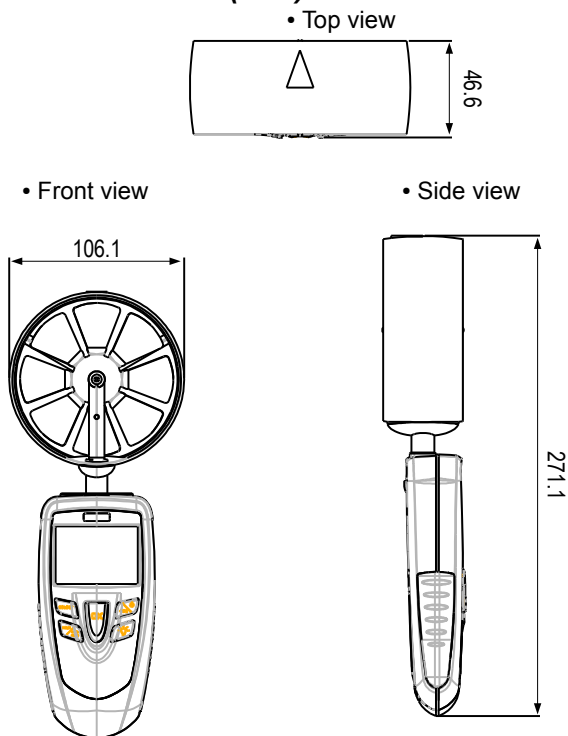## ■ Working principle

Anemometer : Hall effect sensor

Rotation of the shaft of the vane powers a circular magnet of 8 poles. A dual Hall effect sensor, placed next to the magnet senses the signals of magnetic field polarity transition. The sensor signal is converted to electrical frequency and is proportional to the air velocity. Signal chronology allows the detection of rotation direction.

Thermometer : Pt100 probe

Pt100 is a resistance with a positive temperature coefficient which varies according to the temperature. The higher the temperature is, the more the value of the resistance increases. ie : for 0°C ⁼ 100 Ⱳ - for 100°C ⁼ 138.5 Ⱳ .

■ Dimensions (mm)

• Top view

46.6

• Front view

106.1

• Side view

271.1

■ Supplied with ...

● Supplied with ○ Option

DESCRIPTION	LV 120	LV 130
Ø 100 mm vane probe	●	
Moving Ø 100 mm vane probe		●
Air flow cone K25 - K85	○	○
Calibration Certificate	○	○
Transport case	●	●

■ Accessories *(See related datasheet)*

K 25 – K 85	CE 100
Air flow cone (See related datasheet)	Protective cover with magnet and holding system

■ Warranty period

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department for Repair/Calibration).

E INSTRUMENTS

New

Hot-Wire Thermo-Anemometer
VT 100

CE

Ask about: **Calibration** certificate

◼ Functions

- Air velocity and ambient temperature
- Selection of units
- HOLD function
- Minimum and maximum values
- Automatic average
- Air flow calculation
- Adjustable automatic shut-off
- Adjustable backlight

◼ Technical features

Measuring element	**Hotwire air velocity** : Thermistance with a negative temperature coefficient.
	Ambient temperature : Pt100 1/3 DIN
Display	2 lines, LCD technology. Sizes 50 x 34.9 mm.
	1 line of 5 digits with 7 segments (value)
	1 line of 5 digits with 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection
Keypad	Metal-coated with 5 keys
Cable	Straight, lg. 2 m
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power supply	1 alcaline battery 9V 6LR61
Operating temperature	from 0 to 50°C
Storage temperature	from -20 to +80°C
Auto shut-off	adjustable from 0 to 120 min
Weight	6.7 oz
Languages	English, French

VT 100 – Standard Hot-Wire
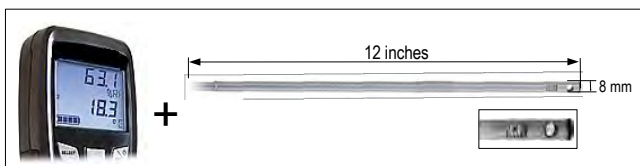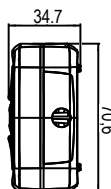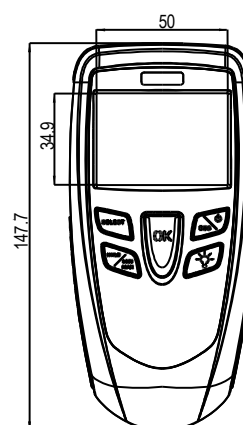
12 inches + 8 mm

◼ Dimensions (mm)

- Top view
- Front view
- Side view

34.7
70.6
50
34.9
147.7
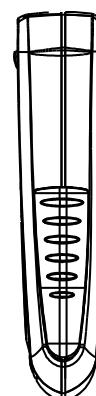
■ Specifications

	Measuring units	Measuring ranges	Accuracy*	Resolutions
AIR VELOCITY (Hotwire)				
	m/s, fpm, Km/h	from 0.15 to 3 m/s from 3.1 to 30 m/s	±3% of reading ±0.05m/s ±3% of reading ±0.2m/s	0.01 m/s 0.1 m/s
AIR FLOW				
	m³/h, cfm, l/s, m³/h	from 0 to 99999 m³/h	±3% of reading ±0.03*area(cm²)	1 m³/h
AMBIENT TEMPERATURE				
	°C, °F	from -20 to +80°C	±0.4% of reading ±0.3°C	0.1°C

All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.

■ Working principle

Hotwire anemometer

A wire is continuously heated at a superior temperature than ambient and continuously cooled by airflow. Constant temperature is maintained by a regulation circuit. The heating current is proportional to the airflow velocity.
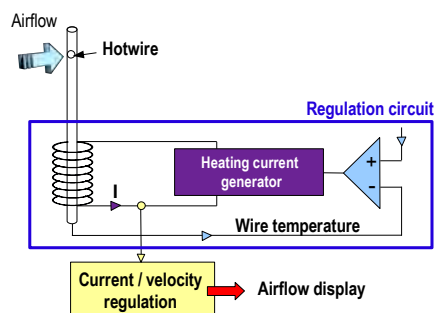
Thermometer : Pt100 probe

Pt100 is a resistance with a positive temperature coefficient which varies according to the temperature. The higher the temperature is, the more the value of the resistance increases. ie : for 0°C ^{a} 100 Ω - for 100°C ^{a} 138,5 Ω .

■ Warranty period

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department).

■ Supplied with ...

465 mm

215 mm

● Included   ○ Optional

DESCRIPTION	VT 100
Hotwire probe Ø 8mm, length 300 mm	●
Airflow cone	○
Calibration certificate	○
Transport case	●

■ Accessories *(See related datasheet)*

CE 100	K 35 - 75 - 120 - 150
Protective cover with magnet and holding system	Air flow cones (See related datasheet)
BNF	**RD 300**
Hotwire cleaning spray	Hotwire extension / to be clipped / straight Ø 10 mm. length 300 mm

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E INSTRUMENTS

New

Thermo-Hygrometers
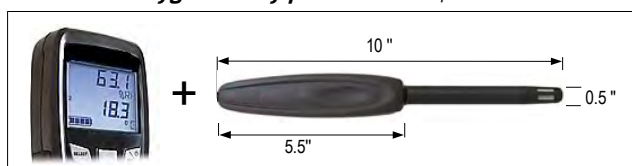## HD 100 - HD 150

CE
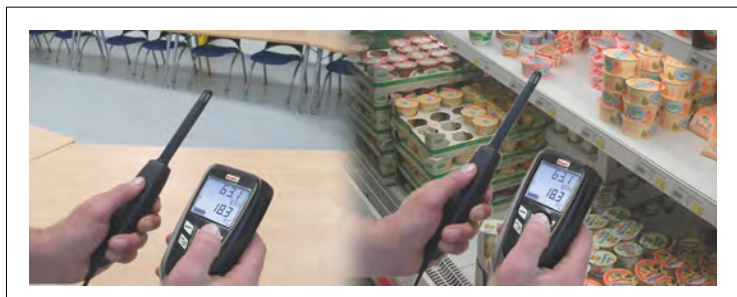
■ Functions

- Relative Humidity, Dew Point and Ambient Temperature
- Selection of units (temperature and dew point)
- HOLD function

- Minimum and maximum values
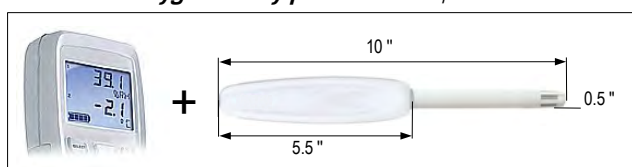- Adjustable automatic shut-off
- Large ICE BLUE, Adjustable backlight

IP54

IP65

■ Technical features

Measuring element	Hygrometry and temperature : CMOS sensor
Display	2 lines, LCD technology. Size: 50 x 34.9 mm. 1 line of 5 digits with 7 segments (value) 1 line of 5 digits with 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection or IP65 with food industry protective cover
Keypad	Metal-coated with 5 keys
Cable	retractable, length 18 inches (450 mm), up to 8 ft (2.4 m) when released
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power supply	1 alkaline battery 9V 6LR61 Included
Operating temperature (instrument)	from 0 to 122°F
Operating temperature (probe)	from -4 to +158°F
Storage temperature	from -4 to +176°F
Auto shut-off	adjustable from 0 to 120 min
Weight	6.7 oz
Languages	English, French

Special food industry

HD 100 – *Hygrometry probe* – *Fixed probe - Black*

10 "
5.5 "
0.5 "

HD 150 – *Hygrometry probe* – *Fixed probe - White*

10 "
5.5 "
0.5 "

■ Specifications

Measuring Units	Measuring Range	Accuracy*	Resolutions
RELATIVE HUMIDITY			
% RH	from 5 to 95% RH	**Accuracy* (Repeatability, linearity, hysteresis)** : ±1.8%RH (from 15°C to 25°C) **Factory calibration incertainty** : ±0.88 % RH **Temperature dependence :** ±0.04 x (T-20) %RH (if T<15°C or T>25°C)	0.1 % RH
DEW POINT			
°C$_{td}$, °F$_{td}$	from -40 to +158°F$_{td}$	±0.8% of reading ±0.6°F$_{td}$	0.1°F$_{td}$
AMBIENT TEMPERATURE			
°C, °F	from -40 to +158°F	±0.4% of reading ±0.3°F	0.1°F

*All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation. As per NFX 15-113 and the Charter 2000/2001 HYGROMETERS, GAL (Guaranteed Accuracy Limit) which has been calculated with a coverage factor value of 2 is ±2.88%RH between 18 and 28°C on the measuring range from 5 to 95%RH. Sensor drift is less than 1%RH/year.

■ *Working principle*

Capacitive sensing element for relative humidity measurement

Inside the probes, a capacitive polymer layer reacts with the humidity present between two metal layers which cover a glass substract. Water absorption is a function of relative humidity of the surrounding environment, and modifies the dielectric constant. The measured signal is directly proportionnal to the relative humidity and is dependent on the atmospheric pressure.
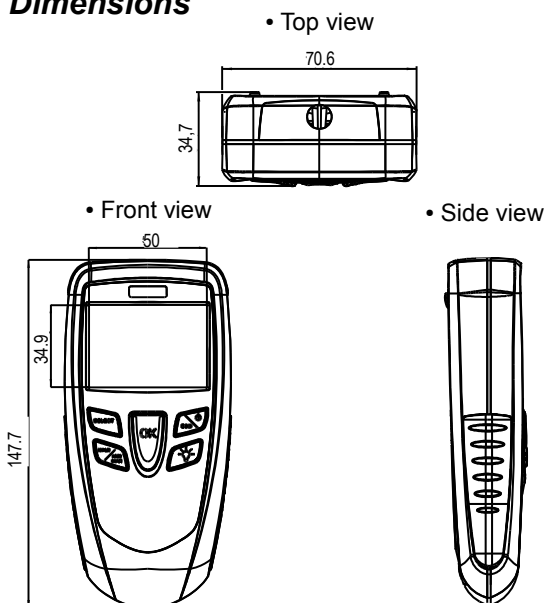
$$C\,(RH) = \frac{\varepsilon_{RH} * \varepsilon_O * A}{d}$$

Porous metal electrode
Humidity sensitive polymer layer
Electrode connection
Main electrode
Glass substract

C	Capacity of relative humidity sensor
ε_{RH}	Relative dielectric permittivity, humidity dependent
ε_O	Void permittivity
A	Electrodes area
d	Electrodes spacing
RH	Relative humidity
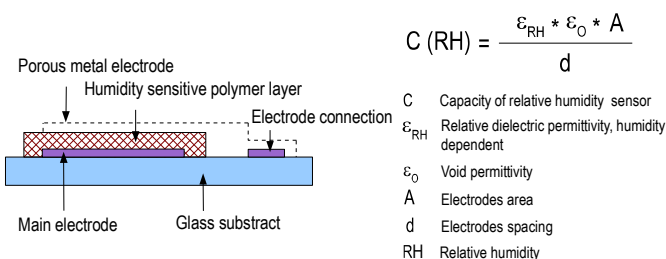
Semiconductor temperature sensor

The direct tension of a silicon diode is :

$V_{BE} = V_{G0}(1-T/T_0)+V_{BE0}(T/T_0)+(nKT/q)\ln(T_0/T)+(KT/q)\ln(IC/IC_0)$

■ *Dimensions*

• Top view

70.6
34.7

• Front view

50
34.9
147.7

• Side view

■ *Supplied with ...*

● Included
○ Optional

18.3 "
8.5 "

DESCRIPTION	HD 100	HD 150
Hygrometry probe Ø 13 mm	●	●
Protective White cover for food industry IP65		●
Soft Vinyl Transport case	●	●
Optional Hard ABS Case Available	●	●

■ *Accessories* (See related datasheet)

CE 100	RTS
Protective cover with magnet and holding system	Telescopic extension (for probe), 1m long and bent at 90° .

■ *Warranty period*

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department).

E INSTRUMENTS

Supplied with Fitting certificate

HM100
Pin Moisture Meter

New

CE

■ Functions

⌐Indication of humidity percentage for 4 types of different material :
  ‣ Hardwood
  ‣ Softwood
  ‣ Concrete and plaster
  ‣ Bricks

⌐Minimum and maximum values for each type of material
⌐Protection cap and auto-test

■ Technical features

Display	4 lines, LCD technology. Sizes 50 x 34.9 mm.
	2 line of 5 digits of 7 segments (value)
	2 line of 5 digits of 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection
Keypad	Metal-coated with 5 keys
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power supply	1 alcaline battery 9V 6LR61
Environment	neutral gas
Operating temperature	from 0 to 50°C
Storage temperature	from -20 to +80°C
Auto shut-off	adjustable from 0 to 120 min
Weight	6.7 oz
Languages	English, French

■ Dimensions (mm)

• Top view

34.7

• Front view

• Side view

70.6

22

10.1

162.7
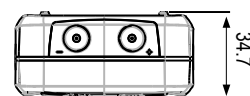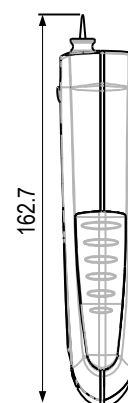
Specifications

Number	Material	Detail	Measuring range	Accuracy*
1	Softwood	Birch, Beech, Spruce, Larch, Cherry tree, Walnut	From 10.0 to 93.7 %	± 1 %
2	Hardwood	Oak, Pine, Maple, Ash, Pin Douglas	From 8.0 to 78.5 %	± 1 %
3	Concrete and plaster		From 1.0 to 2.5 %	± 1 %
4	Bricks		From 0.0 to 22.9 %	± 1 %

All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.

Working principle

Measurement of the electrical resistance

The way how to determinate material moisture used today is the measurement of the wood electrical resistance.

A withered material is highly resistant to electrical current. Indeed, water presence in material modifies the reaction of this material when it is submitted to an electrical current : the more there is water in material, the lower is its resistance and current circulation is easier. If we consider this variation of resistance according to material moisture, we can observe a precise regularity which, apart from a few exceptions, follows a similar curve with almost all wood species, concrete plaster and bricks. So, a measurement instrument able to indicate material resistance can provide a direct measurement of present moisture with the help of a given scale.

Working principle

The principle consists on **making pass** an electrical current between two pins that are pushed in the wood as the figure below. Water is conductive, so, the more the wood will be wet, the more the current will pass.
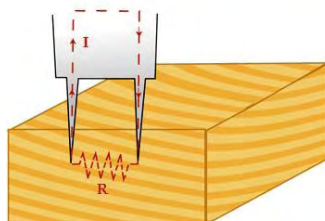

Figure 1 : Measurement principle of electrical resistance

Supplied with ...

● Supplied with   ○ Option

DESCRIPTION	HM 100 S
Protection cap	●
Two sets of pins	●
Fitting certificate	●
Transport case	●
Calibration certificate	○

Accessories *(See related datasheet)*

PH100	CE 100
One set of two additional pins	Protective cover with magnet and holding system

Warranty period

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department for Calibration/Repair).

Thermocouple Thermometers
TK 100 – TK102 – TK150 - TK152

New

Ask About: Calibration certificate

CE

■ Functions

- Temperature
- Selection of units
- HOLD function
- Simplified mode function
- Minimum and maximum values
- Adjustable automatic shut-off

- Large Adjustable ICE BLUE backlight
- Delta T *(TK 102 &152 Only)*
- Adjustable alarms
- Auto-Hold function

TK 102

IP54

IP65

Special food industry

■ Technical Features

|	
Measuring elements	Thermocouple K, J or T class 1
Display	2 lines, LCD technology. Sizes 50 x 34.9 mm. 1 line of 5 digits with 7 segments (value) 1 line of 5 digits with 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection and IP65 with food industry protective cover
Keypad	Metal-coated with 5 keys
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power supply	1 alkaline battery 9V 6LR61 Included
Operating temperature	from 0 to 122°F
Storage temperature	from -4 to +176°F
Auto shut-off	adjustable from 0 to 120 min
Weight	6.7 oz.
Languages	English, French

Special Water Proof Protective Cover for FOOD Market

TK 100 – *1 Channel (TK150 – White for FOOD market)*
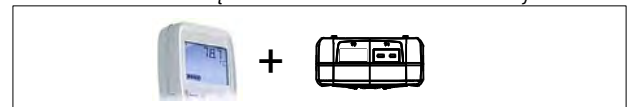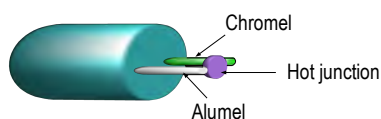
TK 102 – *2 Channels (TK152 – White for FOOD market)*
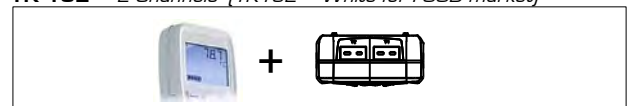
■ Specifications

	Measuring Units	Measuring Ranges	Accuracy*	Resolutions
THERMOCOUPLE PROBES (see related datasheet)				
Thermocouple K	°C, °F	from -328 to 2372°F	±1.1°F or ±0.4% of reading**	0.1 °F
Thermocouple J	°C, °F	from -158 to 1382°F	±0.8°F or ±0.4% of reading**	0.1 °F
Thermocouple T	°C, °F	from -328 to 752°F	±0.5°F or ±0.4% of reading**	0.1 °F

All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.
**the accuracy is expressed either by a deviation in °C, or by a percentage of the value concerned. Only the bigger value is considered.*
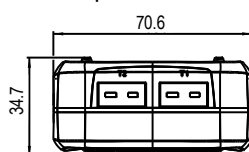
■ Working principle

According to the Seebeck effect, when two wires composed of different metals are joined at both ends, an electric circuit is formed. The voltage increases with temperature.
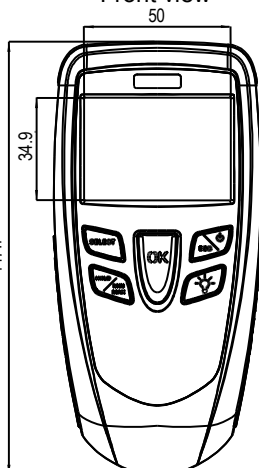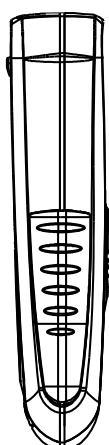
I.E : Thermocouple K

Chromel
Hot junction
Alumel

■ Dimensions (mm)

• Top view

70.6
34.7

• Front view   • Side view

50
34.9
147.7

■ Supplied with ...

● Included   ○ Optional

DESCRIPTION	TK 100	TK 102	TK 150	TK 152
Thermocouple Probe Inputs	○	○	○	○
Waterproof Protective cover for FOOD industry IP65	○	○	●	●
Calibration Certificate	○	○	○	○
Soft Vinyl Transport case	●	●	●	●

Large choice of temperature probes (See related datasheet) :
• Ambient
• Contact
• Penetration
• Food industry penetration
• General use
• Etc...

18 "
8.5 "

■ Accessories (See related datasheet)

CE 100	BN (See related datasheet)
Protective cover with magnet and holding system.	Black ball Ø 150mm with junction for temperature probe Ø 4.5mm. Further dimensions available.
RTS	**GST**
Telescopic extension (for probe), 1m long and bent at 90°.	Silicone heat-conductive grease for temperature probes

■ Warranty Period

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department).

FTang – TK 100 - TK 150 – 11/08 B – We reserve the right to modify the characteristics of our products without notice.
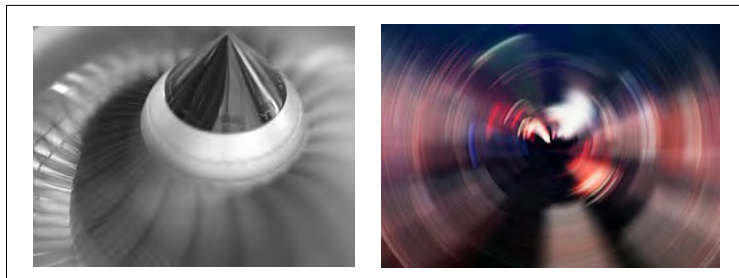
Tachometers

CT 100

New

CE

Functions

- Rotation speed
- Selection of units
- HOLD function
- Minimum and maximum values
- Choice between optical and contact revolution counter
- Adjustable automatic shut-off
- Adjustable backlight

Ask about:

Technical features

Measuring elements	**Optical tachometry :** optical detection (Phototransistor tip length 40 cm max.)
	Contact tachometry : ETC adaptor for optical tachometry probe.
Display	2 lines, LCD technology. Sizes 50 x 34.9 mm.
	1 line of 5 digits with 7 segments (value)
	1 line of 5 digits with 16 segments (unit)
Housing	Shock-proof made of ABS, IP54 protection
Keypad	Metal-coated with 5 keys
Cable	retractable, length 450 mm, up to 2.4 m when released
Conformity	electromagnetical compatibility (NF EN 61326-1 guideline)
Power supply	1 alkaline battery 9V 6LR61
Operating temperature	from 0 to 50°C
Storage temperature	from -20 to +80°C
Auto shut-off	adjustable from 0 to 120 min
Weight	6.7 oz
Languages	English, French

CT 100 O – *Optical probe* – *Fixed probe*

7.4 inches

0.7 inc

CT 100 C – *Optical probe with ETC adaptor* – *Fixed probe*

8.5 inches

1.5 inch

2.4 inches

*except class CT100S
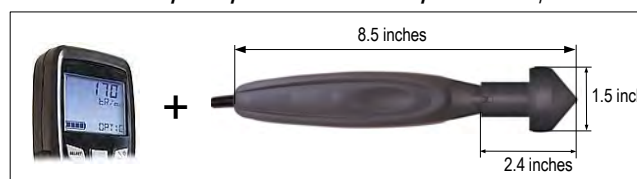
■ *Specifications*

Measuring units	Measuring ranges	Accuracy*	Resolutions
OPTICAL TACHOMETRY			
RPM	from 60 to 10000 RPM from 10001 to 60000 RPM	±0.3% of reading ±1RPM ±30 RPM	1 RPM
CONTACT TACHOMETRY			
RPM, m/min, ft/min, in/min and m/s	from 30 to 20000 RPMn	±1% of reading ±1 RPM	1 RPM

All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.
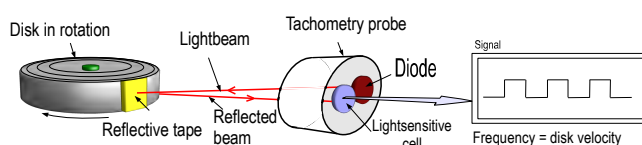
■ *Working principle*

Contact tachometry

A light beam from a diode is reflected by a rotating miror located inside the probe head. A light sensitive cell detects the frequency of the signal of the beam which is proportional to the rotation speed.
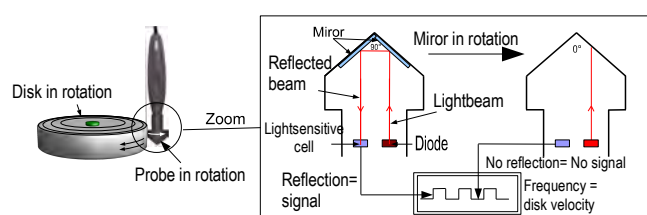
Optical tachometry

A light beam emitted from the diode the probe is reflected by a reflective tape placed on the rotating disk. A lightsensitive cell detects the frequency of the signal of the beam which is proportional to the rotation speed.

■ *Dimensions*

• Top view

• Front view   • Side view

■ *Supplied with ...*

● Included
○ Optional

18 inches
8.5 inch
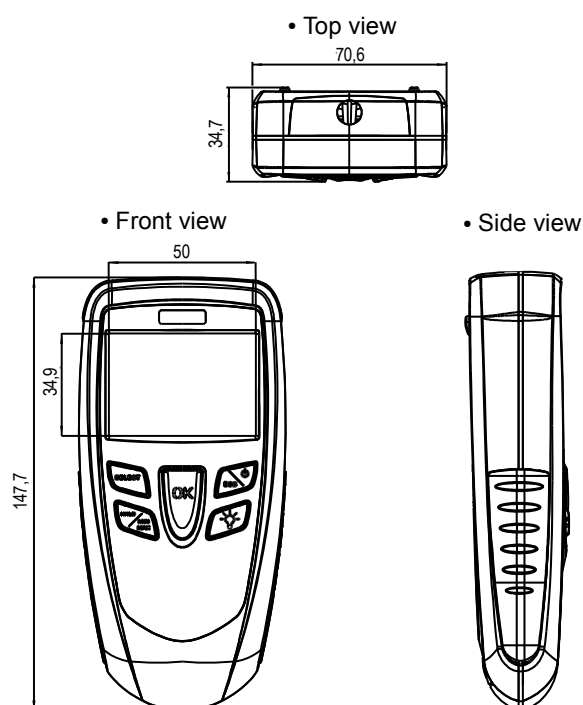
DESCRIPTION	CT 100 O	CT 100 C
Optical tachometry probe Ø 17 mm, length 195 mm	●	●
Contact adaptor fitting optical tachometry probe	○	●
Reflective tape	●	●
Calibration certificate	○	○
Transport case	●	●

■ *Accessories* *(See related datasheet)*

CE 100
Protective cover with magnet and holding system

■ *Warranty period*

Instruments have 1-year guarantee for any manufacturing defect (return to our Service Department).

E INSTRUMENTS

KIRAY 50
Infrared thermometer

New

CE

Infrared thermometer **KIRAY 50** is a key tool to diagnose, inspect and check any temperature, with the advantage of using "no-contact" technology. You can safely measure surface temperatures of hot objects, dangerous or difficult to access. Perfect tool to take temperature in a house, a garage, a workshop, an office, a car, a kitchen etc...
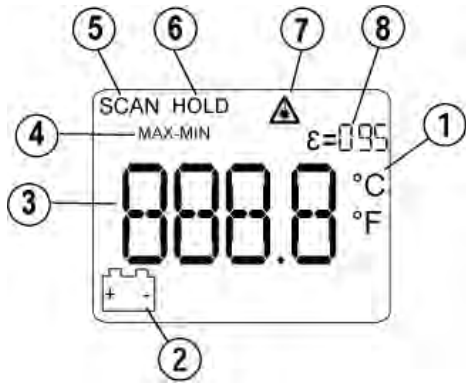
■ *Technical features*

Spectral response	6 - 14 µm
Optical	D.S : 12:1 (100 mm at 1200 mm)
Temperature range	From -58 to 715°F (-50 to +380°C)
Accuracy*	From -50 to -20°C : ±5°C
	From -20 to +380°C : ±2% of reading or ±2°C
Display resolution	0.1°F/C
Response time	less than 1 second
Emissivity	0.95 (fixed value)
Over range indication	LCD will show : «HI » / « Lo »
Laser sighting	Wave length : from 630 nm to 670 nm
	Output < at 1mW, Class 2 (II)
Indication of positive or negative temperature	Automatic (no indication for a positive temperature)
	(-) sign for a negative temperature
Screen	4 digits with LCD backlit screen
Auto-extinction	Automatic after 10 seconds of inactivity
Power supply	Alkaline 9V battery
Autonomy	100 h (inactive laser and backlight)
	30 h (active laser and backlight)
Use temperature	From 0 to +10°C for a short period
	From +11 to +50 °C for a long period
Storage temperature	From -20°C to +60°C
Relative humidity	From 10 to 90%RH in operating mode and lower than 80%RH in storage
Dimensions	155 x 82 x 43 mm
Weight	6 oz (170 g) (included battery)

*Accuracy for an ambient temperature from 18 to 28°C (with a relative humidity lower than 80% RH)

■ *Distance from the target*

Distance	300	600	1200	mm
Diameter	25	50	100	mm

D:S=12:1
100 mm at 1200 mm

YES   **NO**

Make sure that the target is larger than the size of the laser sighting.

■ *Display*

1 - Technical unit °C/°F
2 - Low battery indicator
3 - Temperature value
4 - MAX/MIN value indicator
5 - Current measurement indicator
6 - HOLD indicaeur (fixed measurement)
7 - Laser in operation indicator
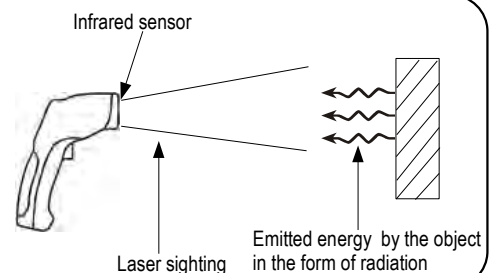**8** - Emissivity value = 0.95 (fixed value)

■ *KIRAY 50 instrument buttons*

1 - **MAX/MIN button :** It allows to display maximum and minimum values during a measurement.

2 - **Backlight button :** It allows to activate or deactivate LCD backlight.

3 - **Laser button :** It allows to activate or deactivate the laser.

4 - **Technical unit button :** It allows to choose measurement unit : °C or °F.

5 - **Trigger :** it allows to measure temperatures.
Press the trigger : **« scan »** is indicated on the top left of the screen. Release it, **« hold »** is indicated on the top left of the screen and the last measurement is displayed. Device automatically shut off after 10 of inactivity.

Description

LCD backlighted display

Max/Min button

Backlight button

Technical unit button (°C or °F)

Laser button

Laser sighting output

Trigger

Battery compartment

■ *Accessories*

• Case holster with passer-by belt
• User manual

■ *CE certification*

This device meets with following standards' requirements.

• EN 50081-1 : 1992, Electromagnetic compatibility, Part 1
• EN 50082-1 : 1992, Electromagnetic compatibility, Part 2

Infrared thermometer, how does it works?

Infrared thermometers can measure the surface temperature of an object. Its optic lens catches the energy emitted and reflected by the object. This energy is collected and focused onto a detector. This information is displayed as temperature. The laser pointer is only used to aim at the target.

Infrared sensor

Laser sighting

Emitted energy by the object in the form of radiation

E INSTRUMENTS

KIRAY 100
Infrared thermometer

New

CE

Infrared thermometer **KIRAY 100** with dual laser sighting is a key tool to diagnose, inspect and check any temperature, with the advantage of using "no-contact" technology. You can safely measure surface temperatures of hot objects, dangerous or difficult to access. Perfect tool to take temperature in a house, a garage, a workshop, an office, a car, a kitchen etc...

■ *Technical features*

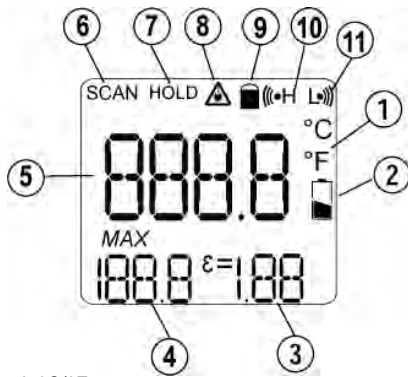|	
Spectral response	8 - 14 µm
Optical	D.S : 20:1 (13 mm at 260 mm)
Temperature range	From -58 to 1472°F (50 to +800°C)
Accuracy*	From -50 à +20°C : ±2.5°C
	From +20 to +300°C : ±1% of reading ±1°C
	From +300°C to +800°C : ±1.5%
Infrared repeatability	From -50 to +20°C : ±1.3°C
	From -20 to +800°C : ±0.5% or ±0.5°C
Display resolution	0.1°F/C
Response time	150 ms
Emissivity	Adjustable from 0.10 to 1.0 (pre-set at 0.95)
Over range indication	Display indication : « ---- »
Dual laser sighting	Wave length : from 630 nm to 670 nm
	Output < 1mW, Class 2 (II)
Positive or negative temperature indication	Automatic (no indication for a positive temperature)
	(-) sign for a negative temperature
Display	4 digits with LCD backlighted display
Auto-extinction	Automatic after 7 seconds of inactivity
High/low alarm	Flashing signal on display and beep signal with adjustable thresholds
Power supply	Alkaline 9V battery (Included)
Autonomy	105 h (inactive laser and backlight)
	20 h (active laser and backlight)
Use temperature	From 0 to +10°C for a short period
	From +11 to +50 °C for a long period
Storage temperature	From -10°C to +60°C
Relative humidity	From 10 to 90% HR in operating mode and > 80% RH in storage
Dimensions	145 x 95 x 40 mm
Weight	6 oz (180 g) (included battery)

*Accuracy for an ambient temperature from 23 to 25°C (with a relative humidity lower than 80% RH)

■ *Distance from the target*

Distance	254	260	508	mm
Diameter	12.7	13	25.4	mm

D:S=20:1
13 mm at 260 mm

YES **NO**

Make sure that the target is larger than the size of the laser sighting.

◼ *Display*

1 – Technical unit °C/°F
2 – Low battery indicator
3 – Emissivity value = 0.95 (factory setting)
4 – Max temperature indicator.
5 – Temperature value
6 – Current measurement indicator
7 – HOLD indicator (fixed measurement)
8 – Laser in operation indicator
9 – Lock indicator (continuous measurement)
10 – High alarm symbol (fixed : activated alarm ;
    flashing + beep : alarm thresholds exceeded)
11 – Low alarm symbol (fixed : activated alarm ;
    flashing + beep : alarm thresholds exceeded)

◼ *KIRAY 100 buttons*

1 – Up button. It allows to increment emissivity and high/low alarm thresholds. This button also allows in measurement mode to activate or deactivate the laser.

2 – Down button. It allows to decrement emissivity and high/low alarm thresholds. This button also allows in measurement mode to activate or deactivate the backlight.

3 – Mode button. It allows to navigate through the modes (emissivity, lock, high alarm, low alarm).

◼ *Description*

LCD backlit display
Up button
Mode button
IR sensor (infrared)
Down button

Output laser sighting
Trigger
Battery compartment
Set technical unit (°C/°F)

◼ *Supplied with*

• Case with passer-by belt
• User manual

◼ *CE Certification*

This device meets with following standards' requirements.

EN 50081-1 : 1992, Electromagnetic compatibility, Part 1
EN 50082-1 : 1992, Electromagnetic compatibility, Part 2

Infrared thermometer, how does it work ?

Infrared thermometers can measure the surface temperature of an object. Its optic lens catches the energy emitted and reflected by the object. This energy is collected and focused onto a detector. This information is displayed as temperature. The laser pointer is only used to aim at the target.

Infrared sensor
Laser sighting
Emitted energy by the object as radiation

E INSTRUMENTS

KIRAY 200
Infrared thermometer

New

CE

Infrared thermometer **KIRAY 200** is an infrared thermometer used to diagnose, inspect and check any temperature. Thanks to its elaborated optical system, it allows an easy and accurate measurement of little distant targets. **KIRAY 200** instrument has an internal memory which can save up to 20 measurements.

Supplied with thermocouple K probe

■ Technical features

• Instrument features

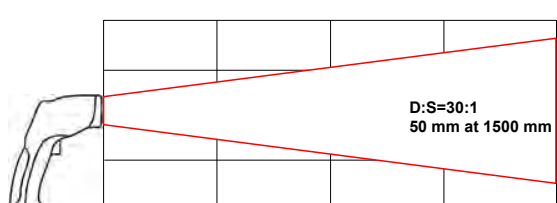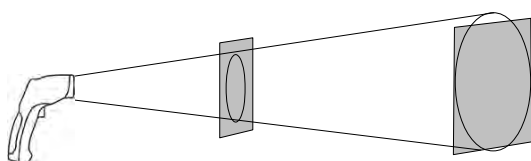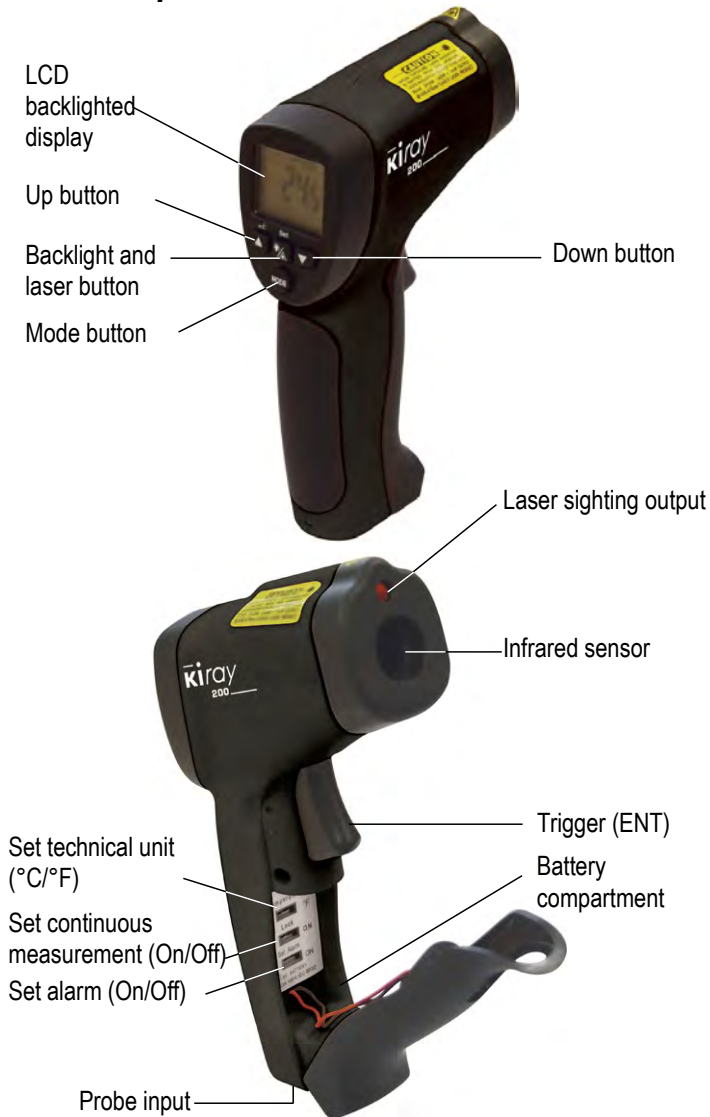|	
Spectral response	8 -14 µm
Optical	D.S : 30:1 (50 mm at 1500 mm)
Response time	Less than 1 second
Temperature range	From -58 to 1560°F (-50 to +850°C)
Accuracy*	From -50 to -20°C : ±5°C
	From -20 to +200°C : ±1.5% of reading ±2°C
	From +200 to +538 °C : ±2% of reading ±2°C
	From +538 to +850°C : ±3.5% of reading ±5°C
Display resolution	0.1°F/C
Emissivity	Adjustable from 0.10 to 1.00 (pre-set at 0.95)
Over range indication	Display indication : « -0L » for a negative over range, « 0L » for a positive over range.
Laser sighting	Wavelength : 630-670 nm Output < 1mW, Class 2 (II)
Positive or negative temperature indication	Automatic (no indication for a positive temperature) (-) sign for a negative temperature
Display	4 ½ digits with LCD backlighted display
Auto-extinction	Automatic after 7 seconds of inactivity
High/low alarm	Flashing signal on display and beep signal with adjustable thresholds
Power supply	Alkaline 9V battery
Autonomy	38 h (inactive laser and backlight) 15 h (active laser and backlight)
Use temperature	From 0 to +10°C for a short period From +11 to + 50 °C for a long period
Storage temperature	From -20°C to +60°C
Relative humidity	From 10% to 90%RH in operating mode and >80%RH in storage
Dimensions	175 x 110 x 45 mm
Weight	230 g (included battery)
Memory	20 temperature values with unit of measurement (°C or °F)

*Accuracy for an ambient temperature from 18 to 28°C (with a relative humidity lower than 80% RH)

■ Distance from the target

Distance	150	300	900	mm
Diameter	5	10	30	mm

D:S=30:1
50 mm at 1500 mm

YES **NO**

Make sure that the target is larger than the size of the laser sighting.

• K thermocouple probe features

Temperature range	From -40 to +400°C
Display range	From -50 to +1370°C
Resolution	0.1°C
Accuracy	±1.5% of reading ±3°C
Cable length	40 inches (1 m)

■ Description

LCD backlighted display

Up button

Backlight and laser button

Mode button

Down button

Laser sighting output

Infrared sensor

Set technical unit (°C/°F)

Set continuous measurement (On/Off)

Set alarm (On/Off)

Trigger (ENT)

Battery compartment

Probe input

■ KIRAY 200 buttons

1 – Up button. It allows to increment emissivity and the thresholds of high and low alarm and to move to the next recorded value.

2 – Set button. It allows to activate or deactivate laser and backlight of the screen. It also allows to record a temperature.

3 – Mode button. It allows to navigate through the modes (emissivity, max. value, min. value, difference, average, high alarm, low alarm, TK value and recorded values).

4 – Down button. It allows to decrement emissivity and the thresholds of high and low alarm and to move to the previous recorded value.

■ Modes flow chart

MODE = mode button
SET = set button
ENT = trigger

Set emissivity (EMS) with up and down buttons

Display of maximum temperature

Display of minimum temperature

Display of the difference of temperature between max. and min. temperatures

Display of average temperature calculated over a measurement period

Display and set of the alarm of high temperature

Display and set of the alarm of low temperature

Display of the temperature given by the K thermocouple probe

Display and recording of temperatures with SET button

■ Display
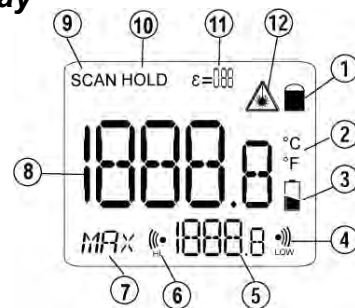
1 - Continuous measurement indicator
2 - Unit of measurement (°C / °F)
3 - Low battery indicator
4 - Low alarm indicator
5 - Temperature value : MAX, MIN, DIF (difference between MAX and MIN values), AVG (average), HAL (high alarm), LAL (low alarm),TK (K thermocouple probe temperature) and LOG (recorded value)
6 - High alarm indicator
7 - EMS, MAX, MIN, DIF, AVG, HAL, LAL, TK and LOG indicator
8 - Temperature value
9 - Current measurement indicator
10 - HOLD indicator (fixed measurement)
11 - Emissivity value
12 - Laser in operation indicator

■ *Settings before measurement*

Before measuring temperature, it is recommended to make some settings:
- Set technical unit (**°C** or **°F**)
- Set the continuous measurement (**On** or **Off**)
- Set the alarm (**On** or **Off**)

To set these **3** parameters, open the battery door by pushing on both sides of the trigger. It is not necessary to disconnect the battery to make these settings.

• Set technical unit (°C or °F)
Set the selector unit to **°C** or **°F** with a screwdriver.

Unit
Temperature
°C ☐ °F

• Set the continuous measurement
This setting allows to let the **Kiray200** instrument in measurement. It does not shut off after 7 seconds.
Set the selector on **On** (continuous measurement is active) or on **Off** (continuous measurement is inactive) with a screwdriver.

Lock
Lock
OFF ☐ ON

• Set the alarm
This setting allows to **activate** or **deactivate** high and low alarm.
Set the selector on **On** (alarms are active) or on **Off** (alarms are inactive) with a screwdriver.

Alarm
Set Alarm
OFF ☐ ON

■ *Operating mode*

- Press ENT trigger to turn on the instrument. The backlighted screen, indicating the temperature, and the laser turn on.
- Keep ENT pressed. Place the laser sighting at the center of the area to be measured.
- Release ENT.
- Read the displayed temperature. (The display stays on for 7 seconds after the last manipulation).
- HOLD appears at the top left of the screen ; measurement stays displayed.
- The **KIRAY200** instrument keeps in memory the last function used.

■ *Command buttons*

ENT Trigger

- Turning on the device.
- **ENT** pressed : activation of the laser sighting and temperature measurement.
- **ENT** released : display is on HOLD (**HOLD** fixed), and give the last measurement. Display stays on for 7 seconds. If no buttons are activated and continuous measurement is inactive, the instrument turns off after 7 seconds.

MODE Mode button

Allows to define the required measurement : Max, Min, AVG, DIF, etc. ... pressing as many times on this button.

- EMS : when **KIRAY200** instrument is turned on, press **MODE** button until **EMS** appears at the bottom left of the screen. Set emissivity by pressing on **UP** button to increment it or **DOWN** button to decrement it. By default, the emissivity is set to 0.95.

- MIN ou MAX : select the Min or Max. temperature.
During a measurement period, keep ENT pressed : the **KIRAY200** instrument displays the temperature of the area sighted by the laser. Press **MODE** button until **MAX** or **MIN** is displayed at the bottom of the screen. These values relate to the temperatures taken by the instrument and the thermocouple probe.

- DIF : during a measurement period, press **MODE** button until **DIF** appears at the bottom left of the screen. The displayed value corresponds to the difference between **MAX** value and **MIN** value.

- AVG : during a measurement period, press **MODE** button until **AVG** appears at the bottom left of the screen. The displayed value corresponds to the average temperature calculated during a measurement period.

- HAL : when **KIRAY200** instrument is turned on, press **MODE** button until **HAL** appears at the bottom left of the screen. The displayed value corresponds to the alarm of **high temperature**. Set this alarm by **incrementing** it with up button or by **decrementing** it with down button.

- LAL : when **KIRAY200** instrument is turned on, press **MODE** button until **LAL** appears at the bottom left of the screen. The displayed value corresponds to the alarm of **low temperature**. Set this alarm by **incrementing** it with up button or by **decrementing** it with down button.

⚠ ***Alarms must be activated (see paragraph Settings before measurement)***

- TK : when **KIRAY200** instrument is turned on, press **MODE** button until **TK** appears at the bottom left of the screen. The displayed value corresponds to the measured temperature by the K thermocouple probe.

- LOG : when **KIRAY200** instrument is turned on, press **MODE** button until **LOG** appears at the bottom left of the screen.
Next to **LOG**, a number between 1 and 20 also appears ; it corresponds to LOG location. If no temperature has been recorded in the shown LOG location, 4 dashes will appear in the lower right corner. To record a temperature, you have to be on **LOG** mode, then choose an empty LOG location (---- visible) and press **SET** button during the measurement or when the measurement is fixed (**HOLD**).
From this mode, you can also clear all the recorded temperatures : press and keep the trigger pressed and press **down** button at the same time until reaching the zero recording, then press **SET** button while keeping **ENT** pressed. A beep is emitted by **KIRAY200** instrument and the **LOG** location moves automatically to 1, signifying that all data have been cleared.

■ Emissivity

Emissivity is a term used to describe the energy-emitting characteristics of materials.

Most (90% of typical applications) organic materials and painted or oxidized surfaces have an emissivity of 0.95 (pre-set in the unit). Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate; cover the surface to be measured with masking tape or flat black paint. Allow time for the tape to reach the same temperature as the material underneath it. Measure the temperature of the tape or painted surface.

See table below for values of emissivity of specific materials :

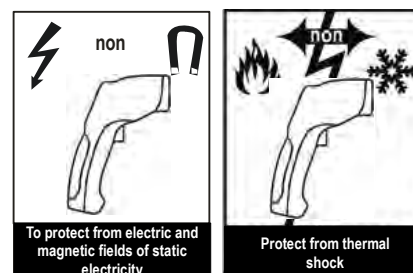| Material	Value	Material	Value
Aluminium	0.30	Ice	0.98
Asbestos	0.95	Iron	0.70
Asphalt	0.95	Lead	0.50
Basalt	0.70	Limestone	0.98
Brass	0.50	Oil	0.94
Brick	0.90	Paint	0.93
Carbon	0.85	Paper	0.95
Ceramic	0.95	Plastic	0.95
Concrete	0.95	Rubber	0.95
Copper	0.95	Sand	0.90
Dirt	0.94	Skin	0.98
Frozen food	0.90	Snow	0.90
Hot food	0.93	Steel	0.80
Glass	0.85	Textile	0.94
Water	0.93	Wood	0.94

■ Important information

For correct measurements :

- Do not take any measurement on metal or shiny or reflective surfaces.
- Do not measure through transparent surfaces such as glass, for example.
- Water vapor, dust, smoke, etc ... may prevent correct measurements because they obstruct the optic of the instrument.
- Make sure that the target is larger than the size of the laser sighting.

To avoid any inconvenience:

- Do not aim directly or indirectly (reflection on reflective surfaces) the laser in the eyes.
- Change the batteries when the indicator blinks.
- Do not use the thermometer around explosive gas, vapor or dust
- Do not leave the device with the lock on (lock at the top right of the screen) because in this configuration, the instrument does not turn off automatically.

To prevent damage on your instrument or equipment please carefully respect these conditions :

| To protect from electric and magnetic fields of static electricity | Protect from thermal shock |

■ CE certification

This device meets with following standards' requirements.

- EN 50081-1 : 1992, Electromagnetic compatibility, Part 1
- EN 50082-1 : 1992, Electromagnetic compatibility, Part 2

■ Maintenance

To install or change the 9V battery, open the part near the trigger and put it in the battery compartment.

■ Accessories

- Case holster with passer-by belt
- User manual
- K thermocouple probe

Infrared thermometer, how it works?

Infrared thermometers can measure the surface temperature of an object. Its optic lens catches the energy emitted and reflected by the object. This energy is collected and focused onto a detector. This information is displayed as temperature. The laser pointer is only used to aim at the target.

Infrared sensor

Laser sighting

Emitted energy by the object in the form of radiation

E INSTRUMENTS

KIRAY 300
Infrared thermometer

New

CE
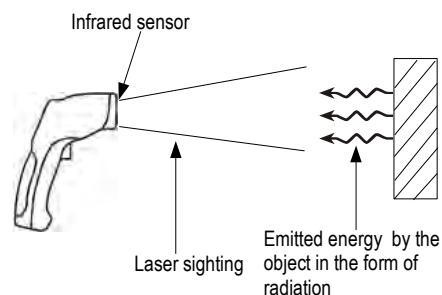
Supplied with thermocouple K probe

Infrared thermometer **KIRAY 300** is a thermometer used to diagnose, inspect and check any temperature. Thanks to its elaborated optical system with a dual laser sighting, it allows easy and accu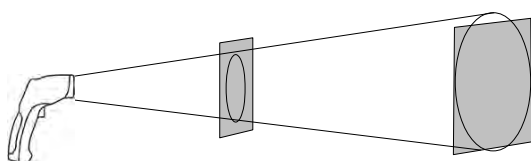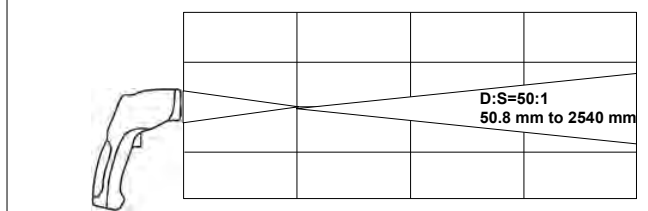rate measurements of little distant targets. The **KIRAY 300** instrument has an internal memory which can save up to 100 measurements. Compatible with thermocouple K probe.

■ *Technical features*

• *Device features*

Spectral response	8 -14 µm
Optical	D.S : 50:1 (50.8 mm at 2540 mm)
Response time	150 ms
Temperature range	from -58 to 3,362°F (-50 to +1850°C)
Accuracy*	from -50 to +20°C : ±3°C
	from +20 to +500°C : ±1% ±1°C
	from +500 to +1000 °C : ±1.5%
	from +1000 to +1850°C : ±2%
Infrared repeatability	from -50 to +20°C : ±1.5°C
	from +20 to +1000°C : ±0.5% or ±0.5°C
	from +1000 to +1850°C : ±1%
Display resolution	0.1 C°
Emissivity	Adjustable from 0.10 to 1.00
Over range indication	LCD will show : « ---- »
Laser sighting	Wavelength : 630-670 nm
	Output < 1mW, Class 2 (II)
Indication of positive or negative temperature	Automatic (no indication for a positive temperature)
	(-) sign for a negative temperature
Screen	3 lines, 4 digits LCD backlit screen
Auto-extinction	Automatic after 7 seconds of inactivity
High/low alarm	Flashing signal on the screen and beep with adjustable thresholds
Power supply	Alkaline 9V battery
Use temperature	from 0 to +10°C for a short period
	from +11 to +50 °C for a long period
Storage temperature	from -10°C to +60°C
Relative humidity	from 10% to 90% RH in operating mode and lower than 80% RH in storage
Dimensions	200 x 140 x 50 mm
Weight	320 g (included battery)
Memory	100 temperature values

*Accuracy for an ambient temperature from 23 to 25°C (with a relative humidity lower than 80% RH)

• *Thermocouple K probe features*

Temperature range	From -40 to +400°C
Display range	From -50 to +1370°C
Resolution	0.1°C
Accuracy	±1.5% of reading ±3°C
Cable length	3.3 ft. (1 m)

■ *Distance from the target*

Distance	1270	2540	3810	mm
Diameter	25.4	50.8	76.2	mm

D:S=50:1
50.8 mm to 2540 mm

YES   **NO**

Make sure that the target is larger than the size of the laser sighting.

■ *KIRAY 300 instrument description*

LCD backlighted display

Up button

Backlight, laser and recording button

Down button

Mode button

Laser sighting output

IR sensor (infrared)

Laser sighting output

Probe input

Button to access to battery

Trigger (ENT)

Battery compartment

■ *KIRAY 300 instrument buttons*

1 - Up button. It allows to increment emissivity and high and low alarm thresholds and to go to the following recorded value. It also allows to navigate between MAX, MIN, AVG and LOG.

2 – Backlight/laser button. It allows to activate or to deactivate laser backlight of the screen. You can also saved a value.

3 - Mode button. It allows to navigate through the modes (MAX and MIN values, DIF and AVG, emissivity, high and low alarms, unit of measurement).
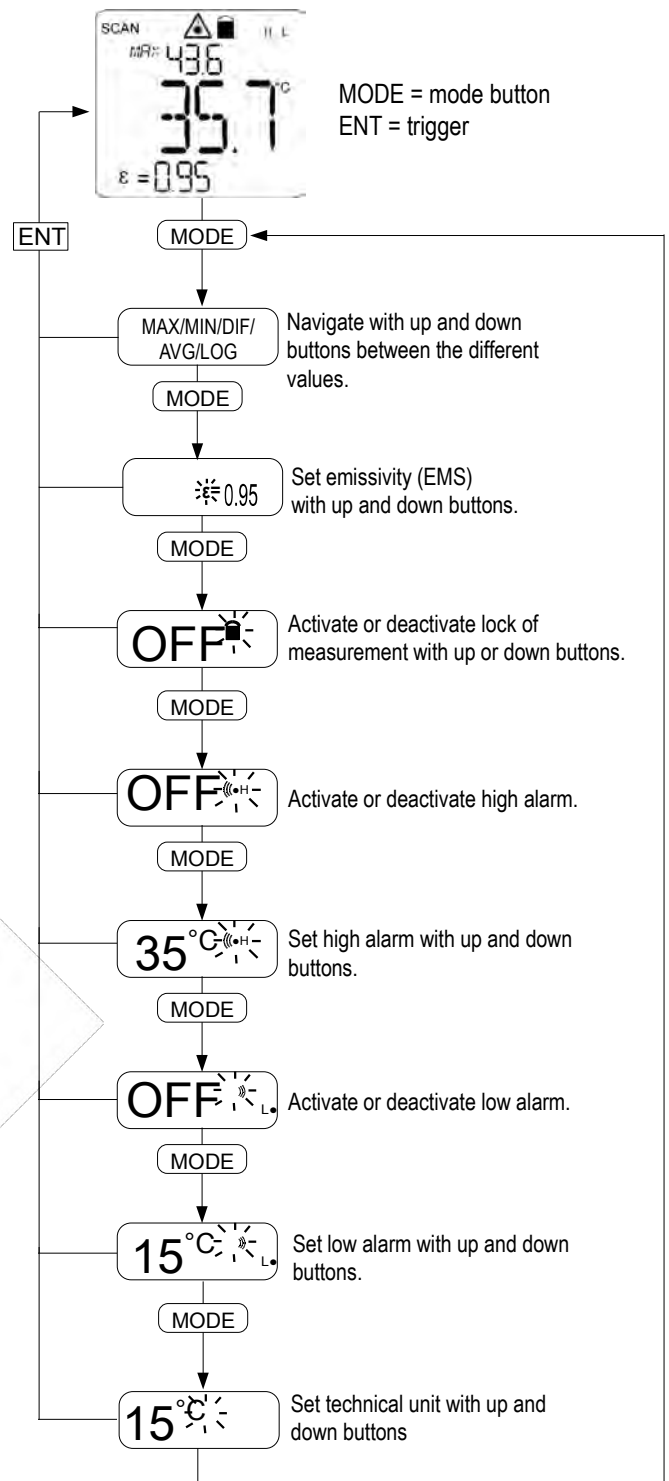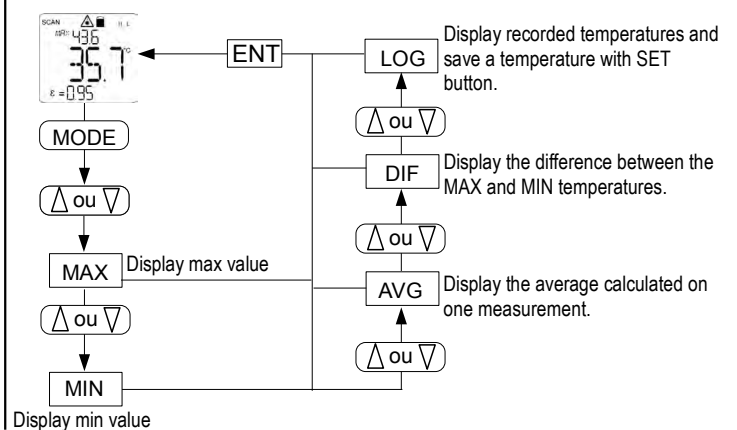
4 - Down button. It allows to decrement emissivity and high and low alarm thresholds and to go to the following recorded value. It also allows to navigate between MAX, MIN, AVG and LOG.
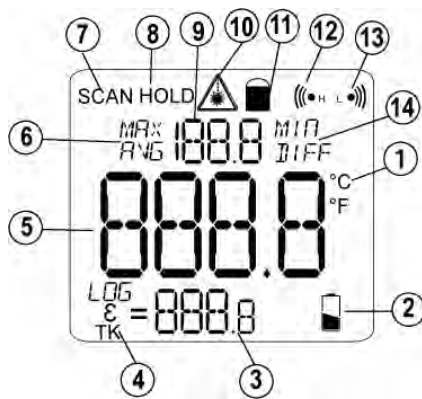
■ *Modes flow chart*

MODE = mode button
ENT = trigger

ENT

MODE

MAX/MIN/DIF/AVG/LOG — Navigate with up and down buttons between the different values.

MODE

0.95 — Set emissivity (EMS) with up and down buttons.

MODE

OFF — Activate or deactivate lock of measurement with up or down buttons.

MODE

OFF — Activate or deactivate high alarm.

MODE

35°C — Set high alarm with up and down buttons.

MODE

OFF — Activate or deactivate low alarm.

MODE

15°C — Set low alarm with up and down buttons.

MODE

15°C — Set technical unit with up and down buttons

■ *Mode MAX/MIN/DIF/AVG/LOG flow chart*

ENT

LOG — Display recorded temperatures and save a temperature with SET button.

△ ou ▽

DIF — Display the difference between the MAX and MIN temperatures.

△ ou ▽

AVG — Display the average calculated on one measurement.

△ ou ▽

MODE

△ ou ▽

MAX — Display max value

△ ou ▽

MIN — Display min value

■ *Display*

1 - Unit of measurement (°C / °F)
2 - Low battery indicator
3 - LOG value (recorded value), EMS (emissivity) and
    TK (K thermocouple probe)
4 - LOG, EMS, TK indicator
5 - Temperature value
6 - MAX and AVG (average) indicator
7 - Current measurement indicator
8 - HOLD (fixed measurement) indicator
9 - MAX, MIN, AVG, DIF value
10 - Laser operation indicator
11 - Continuous measurement indicator
12 - High alarm indicator
13 - Low alarm indicator
14 - MIN and DIF (difference between MIN and MAX values) indicator

■ *Operating mode*

- Push on the **ENT** trigger to turn on the instrument. The backlighted
  screen, indicating temperature and laser, turn on.
- Keep **ENT** pressed. Put the laser sighting at the middle of the area
  you want to measure.
- Release **ENT**.
- Read the displayed temperature. (Display stays activated during 7
  seconds after the last manipulation).
- **HOLD** appears at the top left of the screen ; measurement stays
  displayed.
- Press **UP** or **DOWN** button to change technical unit.

> **During a measurement, the emissivity value is
> automatically displayed at the bottom left of the screen.
> But if the thermocouple K probe is connected, the
> measured value by the probe will be displayed at the
> bottom left of the screen.**

■ *Command buttons*

ENT Trigger

- Turning on the instrument.
- **ENT** pressed : activation of the laser sighting and of the temperature
measurement.
While maintaining **ENT** key, it is possible to change the value of the
emissivity by pressing **UP** or **DOWN**.
Still maintaining ENT key, it is possible to visualize the MAX, MIN, DIF,
AVG values by pressing the MODE button.
- **ENT** released : Display is on **HOLD** (fixed **HOLD**), and gives the last
measurement. The screen stays on 7 seconds. If no buttons are
activated and if continuous measurement is inactive, the instrument
turns off after 7 seconds.

MODE Mode button

It allows to set measurement type : emissivity, lock, high alarm, low
alarm, record values, etc ... by pressing as many times on this button.

- EMS : when **KIRAY300** instrument is turned on, press **MODE** until

ε= flashes. Set emissivity pressing **UP** button to increment it or **down**
button to decrement it. Emissivity is pre-set on 0.95.
To return on measurement, press **ENT** ; press **MODE** to switch to next
mode.

- Lock : when **KIRAY300** instrument is turned on, press **MODE** until
the lock at the top of the screen flashes and **OFF** displays. Press **UP**
or **DOWN** button to put the lock **ON**
Press **MODE** to switch to the next mode, or press once **ENT** : the
KIRAY300 instrument takes continuous measurement. To cancel
the lock, press once **ENT**.

- High alarm : when **KIRAY300** instrument is turned on, press
MODE until **H** flashes at the top of the screen to the right. Press **UP**
or **DOWN** button to activate or deactivate the alarm, then press
MODE to adjust the alarm threshold. Increment threshold with **UP**
button and decrement threshold with **DOWN** button.
To return on measurement, press **ENT** ; press **MODE** to switch to
next mode.

- Low alarm : when **KIRAY300** instrument is turned on, press **MODE**
until **L** flashes at the top of the screen to the right. Press **UP** or
DOWN button to activate or deactivate the alarm, then press **MODE** to
adjust the alarm threshold. Increment threshold with **UP** button and
decrement threshold with **DOWN** button.
To return on measurement, press **ENT** ; press **MODE** to switch to next
mode.

- °C / °F : when **KIRAY300** instrument is turned on, press **MODE**
until technical unit flashes at the right of the displayed value. Press **UP**
or **DOWN** button to change unit : °C or °F degree.
To return on measurement, press **ENT** ; press **MODE** to switch to next
mode.

LOG : while a measurement (**ENT** pressed or lock activated), press
MODE until **LOG** appears at the bottom of the screen to the left.
At the top of the screen, a number between 1 and 100 is also shown ;
it is the **LOG** location. If nothing has been recorded 4 dashed line
«----» appears while the temperature corresponding to the number
appears if a temperature has been recorded.
To save a temperature, you have to be on **LOG** mode, then choose an
empty location (---- visible) and press **laser/backlight** button during
measurement or the measurement is fixed (**HOLD**).
From this mode, you can also clear all the recorded temperatures :
press and hold the trigger and press **DOWN** button at the same time
until reach zero recording, then press **laser/backlight** button while
keep **ENT** pressed. A beep is emitted and **LOG** location will
automatically change to "1", signifying that all data locations have
been cleared.

■ *Emissivity*

Emissivity is a term used to describe the energy-emitting characteristics of materials.
Most (90% of typical applications) organic materials and painted or oxidized surfaces have an emissivity of 0.95 (pre-set in the unit). Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate; cover the surface to be measured with masking tape or flat black paint. Allow time for the tape to reach the same temperature as the material underneath it. Measure the temperature of the tape or painted surface.
See table below for values of emissivity of specific materials :

Aluminium	0.30	Ice	0.98
Asbestos	0.95	Iron	0.70
Asphalt	0.95	Lead	0.50
Basalt	0.70	Limestone	0.98
Brass	0.50	Oil	0.94
Brick	0.90	Paint	0.93
Carbon	0.85	Paper	0.95
Ceramic	0.95	Plastic	0.95
Concrete	0.95	Rubber	0.95
Copper	0.95	Sand	0.90
Dirt	0.94	Skin	0.98
Frozen food	0.90	Snow	0.90
Hot food	0.93	Steel	0.80
Glass	0.85	Textile	0.94
Water	0.93	Wood	0.94

■ *Maintenance*

To install or change the 9V battery, open the part near the trigger and put it in the battery compartment..
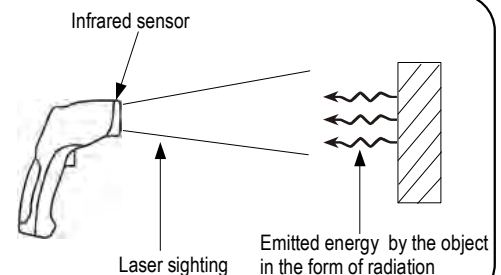
■ *CE certification*

This device meets with following standards' requirements.

• EN 50081-1 : 1992, Electromagnetic compatibility, Part 1
• EN 50082-1 : 1992, Electromagnetic compatibility, Part 2
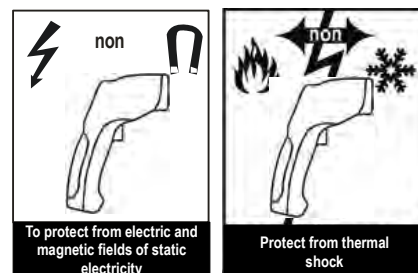
■ *Important information*

For correct measurements :

• Do not take any measurement on metal or shiny or reflective surfaces.
• Do not measure through transparent surfaces such as glass, for example.
• Water vapor, dust, smoke, etc ... may prevent correct measurements because they obstruct the optical of the instrument.
• Make sure that the target is larger than the size of the aiming point of laser.

To avoid any inconvenience:

• Do not aim directly or indirectly (reflection on reflective surfaces) the laser in the eyes.
• Change the batteries when the indicator blinks.
• Do not use the thermometer around explosive gas, vapor or dust
• Do not leave the device with the lock on (lock at the top right of the screen) because in this configuration, the instrument does not turn off automatically.

To prevent damage on your instrument or equipment please carefully respect these conditions :

non	
To protect from electric and magnetic fields of static electricity	Protect from thermal shock

■ *Accessories*

• Transport case
• User manual
• Thermocouple K probe
• Tripod

Infrared thermometer, how does it work?

Infrared thermometers can measure the surface temperature of an object. Its optic lens catches the energy emitted and reflected by the object. This energy is collected and focused onto a detector. This information is displayed as temperature. The laser pointer is only used to aim at the target.

Infrared sensor

Laser sighting

Emitted energy by the object in the form of radiation

Once returned, required waste collection will be assured in the respect of the environment in accordance to 2002/96/CE guidelines relating to WEEE.

Solarimeter
SL 100

New

CE

■ Technical features

SL100 instrument

Solar irrigation measuring range	from 1 W/m^2 to 1300 W/m^2
Energetic exposure measuring range	from 1 Wh/m^2 to 500 kWh/m^2
Frequency of measurement	2 / s
Accuracy	5% of measurement
Calculation frequency (W/m^2)	1 / min (average on 60 seconds)
Capacity of measurement (Wh/m^2)	3 days – Results saved when instrument is switched off
Operating temperature	from -10°C to +50°C
Storage temperature	from -10°C to +55°C
Housing dimensions	2.3 x 4.75 x 1.3 inches
Autonomy	more than 72 hours in continuous mode, when using a power supply adapter
Power supply	3 AAA batteries
Electronic	Digital
Electronic board	Varnish
Conformity	in accordance with RoHS directives

Solar cell

Spectral response	from 400 to 1100 nm
Nominal sensitivity	100mv for 1000W/m^2 *
Response in cosine	corrected until 80°
Coefficient in temperature	+0.1%/°C
Effective area	1 cm2
Operating temperature	from -30°C to +60°C
Humidity dependence	100% RH
UV performance	excellent (PMMA filter)
Mode	photovoltaic
Material	polycristallin silicon
Front face	translucent PMMA
Tightness	Polyurethane resin and housing in PMMA and polyacetol
Cell weight	2.1 oz
Cell dimensions	30 x 32 mm
Cable length	4.1 ft (can be unplugged)

Portable autonomous solarimeter can measure solar irrigation for the control of photovoltaic and thermal installations on test or on site:

- **Measurement and spot check of solar power in W/m^2**

  - instantaneous,

  - average,

  - min./max. values,

  - hold function

- **Calculation of energetic exposure in Wh/m^2**
  during timed dataset *

- **Results (Wh/m^2) saved when instrument is switched off**

■ SL 100

- Easy to use, for immediate information
- Evaluation of generated electric power, optimum orientation of solar panels, and performances follow-up.
- Choice and determination of thermal or photovoltaic generators features.

For QualiSOL, QualiPV certified professionals, the office control for the Guarantee of Solar Result
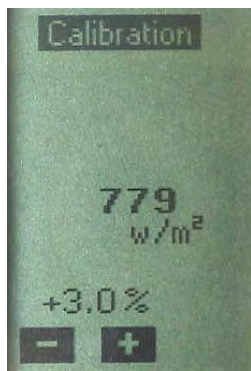
■ Presentation

① ② ③ **Functions** keys
④ **Delete and Back screen** key
⑤ **Screen** key
⑥ **On/Off** key

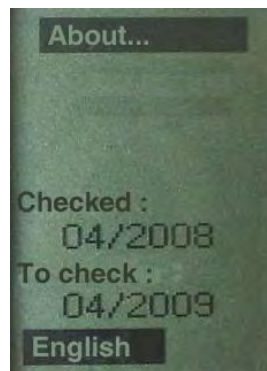## Settings

Adjust contrast and activate backlight

Calibrate instrument when being returned to laboratory

Remind last checking date

E INSTRUMENTS

Solarimeter
SL 200

New CE

■ Technical features

• SL 200 Instrument

Solar irrigation measuring range	from 1 W/m^2 to 1300 W/m^2
Energetic exposure measuring range	from 1 Wh/m^2 to 500 kWh/m^2
Frequency of the measure	2 / s
Accuracy	5% of measurement
Calculation frequency (W/m^2)	1 / min (average on 60 seconds)
Storage capacity	31 days, 44640 saved recording points
Fast datas download	1000 values/second
Detection	out of range and sensor default
Operating temperature	from -10°C to +50°C
Storage temperature	from -10°C to +55°C
Package dimensions	58 x 120 x 33 mm
Autonomy	more than 72 hours in continuous mode
	Unlimited with power supply adapter
Power supply	3 LR3-AAA batteries
Electronic	Digital
Electronic card	Varnish
Conformity	in accordance with RoHS directives

• Solar cell

Spectral response	from 400 to 1100 nm
Nominal sensitivity	100mv for 1000W/m^2 *
Response in cosine	corrected until 80°
Coefficient in temperature	+0.1% /°C
Effective area	1 cm²
Operating temperature	from -30°C to +60°C
Humidity dependence	100% RH
UV performance	excellent (PMMA filter)
Mode	photovoltaic
Material	polycristallin silicon
Front face	translucent PMMA
Tightness	Polyurethane resin and housing in PMMA and polyacetol
Cell weight	2.1 oz
Cell dimensions	30 x 32 mm
Cable length	4.1 ft (can be unplugged)

* SL200 is supplied with a calibration certificate in reference to the WRR (World Radiometric Reference).
** Timed : duration of dataset is expressed in DD/HH/MM/SS

The portable autonomous solarimeter measures the solar irrigation for the control of photovoltaic and thermal installations on test or on site:

- **Measurement and spot check of the solar irrigation in W/m²**
  (instantaneous, average, time-recording, min/max values, hold function)

- **Calculation of the energetic exposure in Wh/m²**
  during the timed measures campaign*

- **Storage and saving of average values**
  of power and updating the energetic exposure calculation every minutes

- **Recorded data can be read on the display, and the graphic function allows a fast interpretation of the measure file**
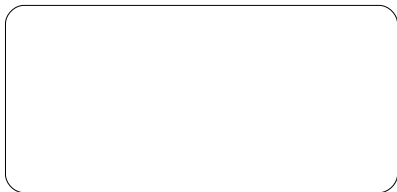
■ SL 200

- Easy to use, for immediate informations
- Evaluation of the produced electric powers, optimum orientation of solar panels and performances follow-up.
- Analysis of sunshine on site, on short and long-term period.
- Choice and determination of the thermal or photovoltaic generators features
- Storage and saving of average values of power; update of energetic exposure calculation every minute
- Easy use of data stored in memory,
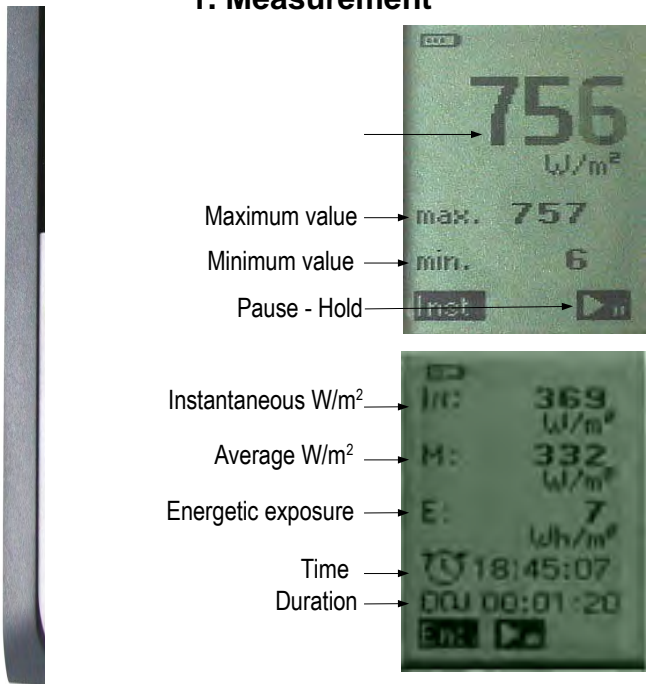- Reading and graphical approximation of data by 24 hours via transfer data software.
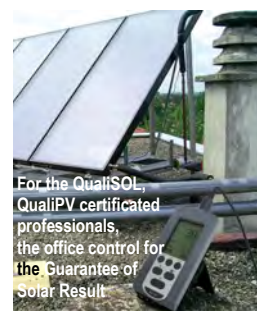
For the QualiSOL, QualiPV certified professionals, the office control for the Guarantee of Solar Result
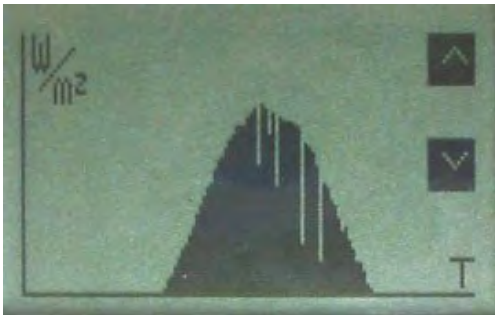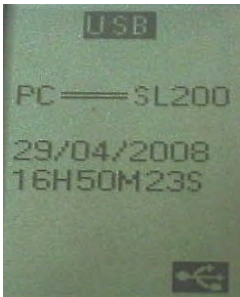
■ Presentation

1. Measurement

756 W/m²

Maximum value → max. 757
Minimum value → min. 6
Pause - Hold → Inst ▶ II

Instantaneous W/m² → Irr: 369 W/m²
Average W/m² → M: 332 W/m²
Energetic exposure → E: 7 Wh/m²
Time → 18:45:07
Duration → 00J 00:01:20
Env ▶

2. Reading

Reading
max. 375 W/m²
min. 34 W/m²
M: 327 W/m²
E: 40 Wh/m²
00J 00:07:19

Global values

Reading
Irr: 653 W/m²
E: 13 Wh/m²
12:12
29/04/2008
< >

Time-recorded stored values

W/m²

T

Graphic display 00H /24H

Scrolling of the successive graphs 00H-24H

3. Transfer

USB
PC ═══ SL200
29/04/2008
16H50M23S

■