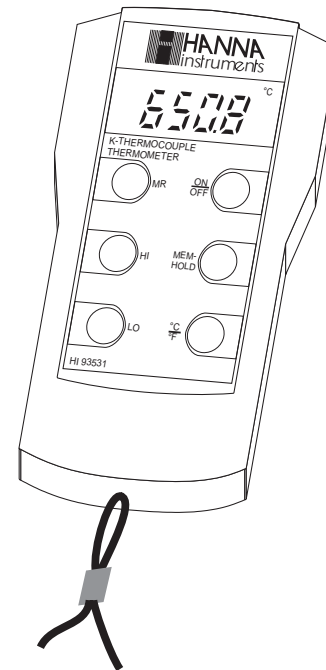


Instruction Manual

HI 93530 - HI 93531 HI 93532 - HI 93551 HI 935005 - HI 935006 HI 935007

Microprocessor-based Thermocouple Thermometers



PRINTED IN
ITALY

MANK93R3
04/98



 **HANNA**
instruments

<http://www.hannacan.com>

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instruments
<http://www.hannacan.com>

CE

These Instruments are in
Compliance with the CE Directives

Dear Customer,
Thank you for choosing a Hanna Instruments Product.

Please read this instruction manual carefully before using the instrument. This manual will provide you with all the necessary information for the correct use of the instrument, as well as a precise idea of its versatility in a wide range of applications.

These instruments are in compliance with the CE directives EN 50081-1 and EN 50082-1.

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CE DECLARATION OF CONFORMITY



DECLARATION OF CONFORMITY

We

Hanna Instruments Srl
V.le delle industrie 12
35010 Ronchi di Villafranca (PD)
ITALY

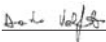
herewith certify that the thermometers

HI 93530 HI93531 HI 93532 HI 93551
HI 935005 HI 935006 HI 935007

have been tested and found to be in compliance with the following regulations:

IEC 801-2	Electrostatic Discharge
IEC 801-3	RF Radiated
EN 55022	Radiated, Class B

Date of Issue: 26-03-1996


D. Volpato - Engineering Manager
On behalf of
Hanna Instruments S.r.l.

Recommendations for Users

Before using these products, make sure that they are entirely suitable for the environment in which they are used.

Operation of these instruments in residential area could cause unacceptable interferences to radio and TV equipments, requiring the operator to take all necessary steps to correct interferences.

Any variation introduced by the user to the supplied equipment may degrade the instruments' EMC performance.

In particular cases the instruments could turn off. In such cases they can be turned on by pressing the ON/OFF key.

To avoid electrical shock, do not use these instruments when voltages at the measurement surface exceed 24VAC or 60 VDC.

To avoid damages or burns, do not perform any measurement in microwave ovens.

WARRANTY

All Hanna Instruments **meters are warranted for two years** against defects in workmanship and materials when used for their intended purpose and maintained according to instructions.

The probes are warranted for a period of six months.

This warranty is limited to repair or replacement free of charge.

Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact the dealer from whom you purchased the instrument. If under warranty, report the model number, date of purchase, serial number and the nature of the failure. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization Number from the Customer Service department and then send it with shipment costs pre-paid. When shipping any instrument, make sure it is properly packaged for complete protection.

To validate your warranty, fill out and return the enclosed warranty card within 14 days from the date of purchase.

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Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice.

PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipment. If noticeable damage is evident, notify your Dealer.

Each thermometer comes supplied with a 9V battery and instruction manual.

Note: Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packing together with the supplied accessories.

GENERAL DESCRIPTION

HI93530, HI93531, HI93532, HI935005 and HI935007 allow temperature measurement using interchangeable **K**-type thermocouple probes.

HI 93551 allows temperature measurements with different types of thermocouples (**K-J-T**). This meter is equipped with a key that switches range from K-type to J-type or T-type thermocouples.

HI935006 and **HI935007** are specifically designed for the food industry. **HI935006** allows temperature measurement using interchangeable **T**-type thermocouple probes. **HI935007** uses a fixed **K**-type penetration temperature probe (HI 766C) with 1 m (3.3') cable.

The non-linearity of the temperature probe is linearized by the built-in microprocessor, in order to achieve high degree accuracy and resolution. It also permits accurate compensation for drifts in the measurement circuit and the reference junction.

HI 93532 has two built-in K-type probe connectors. By simply pressing a button, the meter switches between the two readings on the display. A "ΔT" button will display the difference between the two probe readings.

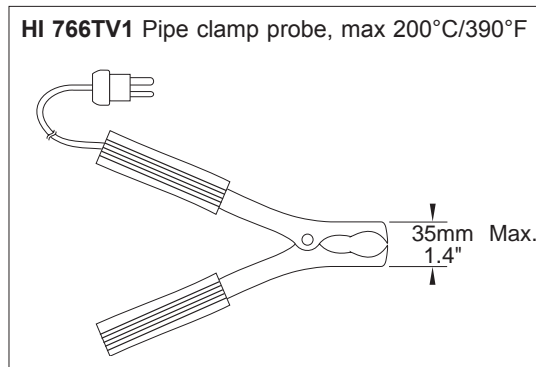
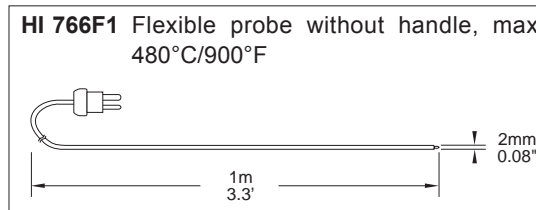
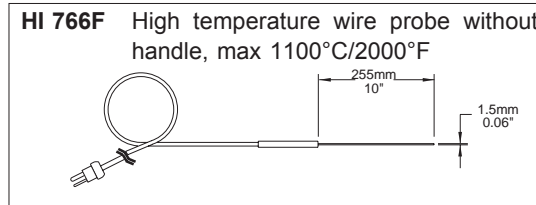
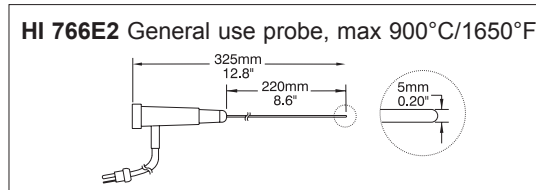
Standard features include:

- Interchangeable probes (except HI935007)
- Clear Liquid Crystal Display
- Two year Warranty
- Possibility of switching between the Centigrade and the Fahrenheit scale (for **HI 93530**, **HI 93531**, **HI 93551**, **HI 935005**, **HI 935007** only)
- HOLD function that freezes the reading on the display (for **HI 93530**, **HI 93551** and **HI 935005** only)
- HI-LO memory recall function (for **HI 93531**, **HI 93551** and **HI 935005** only)
- Low battery detection.

All these functions are easily accessible through the keypad.

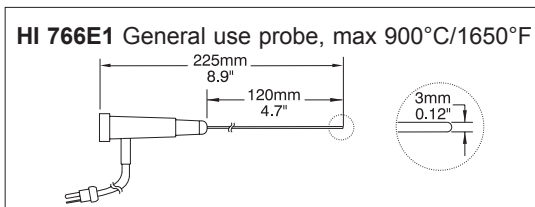
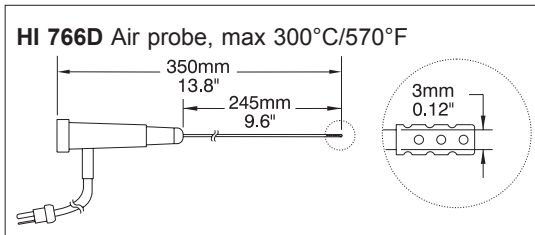
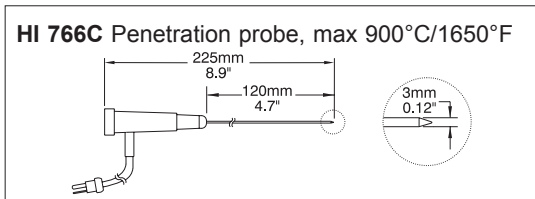
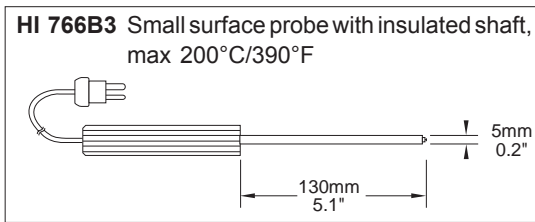
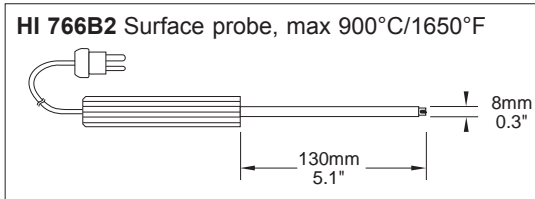
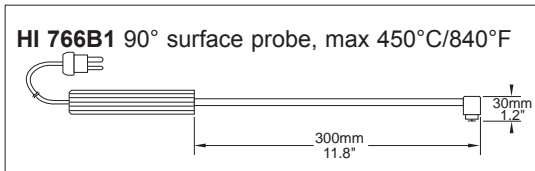
Self-explanatory symbols are used to remind the user of the operating mode or condition.

Hanna manufactures several K-type thermocouple probes for different applications. See pages 22-25 for more details.

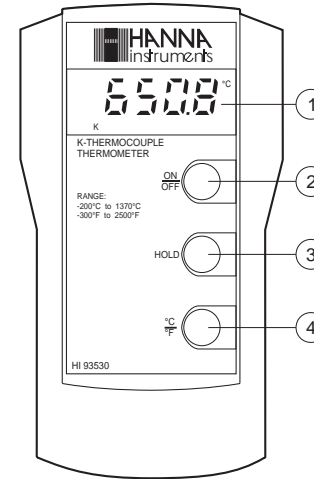


Other accessories:

- HI 710004** Soft carrying case measuring 150x90x30mm
- HI 710007** Blue rubber boot measuring 155 x 90 x 45 mm
- HI 710008** Orange rubber boot measuring 155 x 90 x 45 mm
- HI 710031** Rugged carrying case
- MANK93R3** Instruction manual



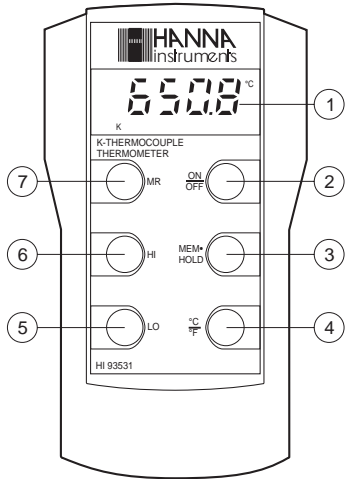
FUNCTIONAL DESCRIPTION AND SPECIFICATIONS OF HI 93530



1. Liquid Crystal Display
2. ON/OFF Key
3. Reading Hold Key
4. Measuring Scale Key (°C or °F).

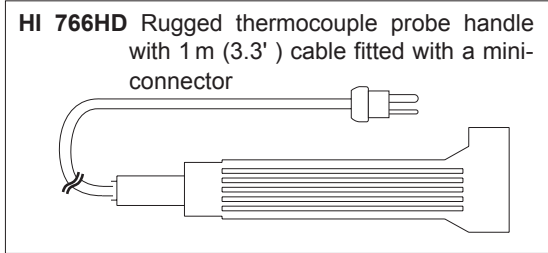
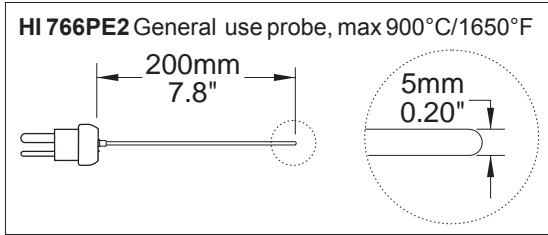
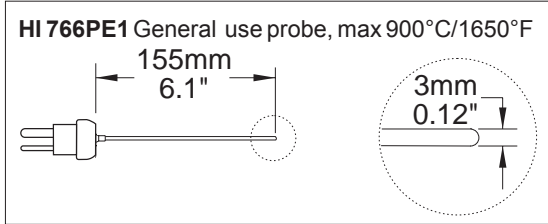
	Specifications
Range	-200.0 to 1370°C -300.0 to 2500°F
Resolution	0.1°C (-200.0 to 999.9°C) 1°C (1000 to 1370°C) 0.1°F (-300.0 to 999.9°F) 1°F (1000 to 2500°F)
Accuracy	±0.2% F.S. for one year, excluding probe error
Typical EMC Deviation	±3°C ±6°F
Probe	K-thermocouple (optional) (see pages 22-25)
Battery	9V/100 hours of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	143x80x38mm (5.6x3.2x1.5")
Weight	320 g (11.3 oz.)

FUNCTIONAL DESCRIPTION AND SPECIFICATIONS OF HI 93531

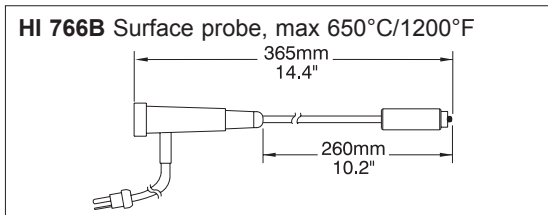
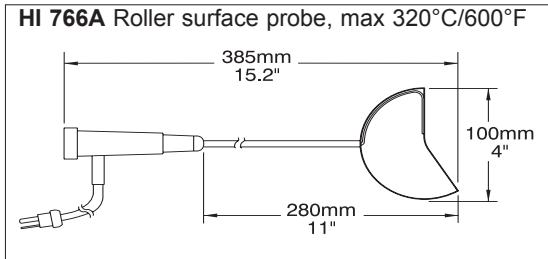


1. Liquid Crystal Display
2. ON/OFF Key
3. Reading Memory / Hold Key
4. Measuring Scale Key (°C or °F)
5. Minimum Temperature Recalling Key
6. Maximum Temperature Recalling Key
7. Memory Recalling Key.

	Specifications
Range	-200.0 to 1370°C -300.0 to 2500°F
Resolution	0.1°C (-200.0 to 999.9°C) 1°C (1000 to 1370°C) 0.1°F (-300.0 to 999.9°F) 1°F (1000 to 2500°F)
Accuracy	±0.2% F.S. for one year, excluding probe error
Typical EMC Deviation	±3°C ±6°F
Probe	K-thermocouple (optional) (see pages 22-25)
Battery	9V/100 hrs of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	143x80x38mm (5.6x3.2x1.5")
Weight	320 g (11.3 oz.)



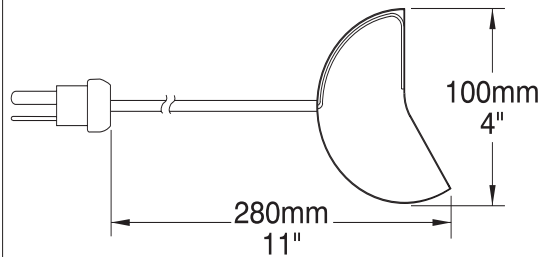
with integral handle, 1 m cable & mini-connector:



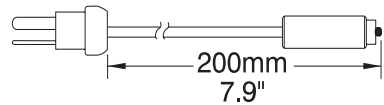
ACCESSORIES

K-Type Thermocouple Probes with detachable handle & mini-connector (to be plugged into **HI 766HD** probe handle):

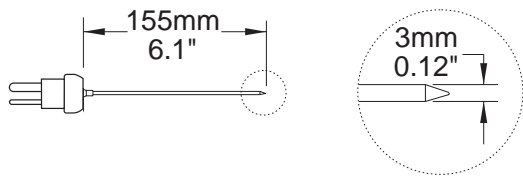
HI 766PA Roller surface probe, max 320°C/600°F



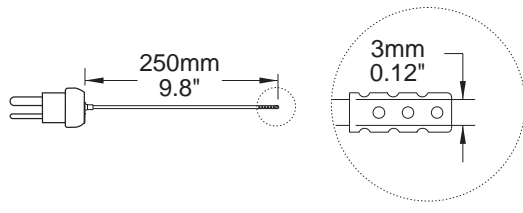
HI 766PB Surface probe, max 650°C/1200°F



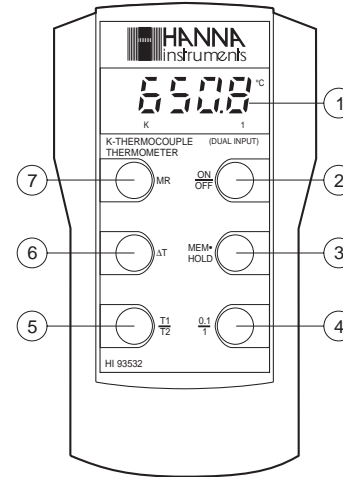
HI 766PC Penetration probe, max 900°C/1650°F



HI 766PD Air probe, max 300°C/570°F



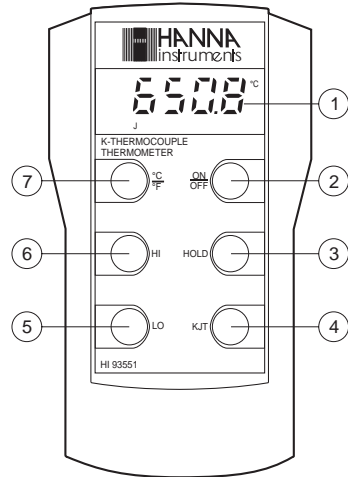
FUNCTIONAL DESCRIPTION AND SPECIFICATIONS FOR HI 93532



1. Liquid Crystal Display
2. ON/OFF Key
3. Reading Memory/Hold Key
4. Measurement Resolution Key (0.1 or 1)
5. Input Probe Selection Key (T1 or T2)
6. Temperatures Difference Key
7. Memory Recalling Key.

	Specifications
Range	-200.0 to 1370°C
Resolution	0.1°C (-200.0 to 999.9°C) 1°C (1000 to 1370°C)
Accuracy	±0.2% F.S. for one year, excluding probe error
Typical EMC Deviation	±3°C ±6°F
Probe	K-thermocouple (optional) (see pages 22-25)
Battery	9V/100 hrs of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	143x80x38mm (5.6x3.2x1.5")
Weight	320 g (11.3 oz.)

FUNCTIONAL DESCRIPTION AND SPECIFICATIONS OF HI 93551



1. Liquid Crystal Display
2. ON/OFF Key
3. Reading Memory/Hold Key
4. Thermocouple Type Selection Key (K or J or T)
5. Minimum Temperature Recalling Key
6. Maximum Temperature Recalling Key
7. Measuring Scale key (°C or °F).

		Specifications
Range	K	-200.0 to 1370°C / -300.0 to 2500°F
	J	-200.0 to 900.0°C / -300.0 to 1650°F
	T	-200.0 to 400.0°C / -300.0 to 750.0°F
Resolution		0.1°C (up to 999.9°C) 0.1°F (up to 999.9°F) 1°C (over 1000°C) 1°F (over 1000°F)
Accuracy		K= ±0.2% F.S. J = ±0.2% F.S. T = ±0.5% F.S. for one year, excluding probe error
Typical EMC Deviation		±3°C ±6°F
Probe		K, J and T thermocouple(optional) (for K-thermocouple see pages 22-25)
Battery		9V/100 hrs of continuous use
Environment		0 to 50°C (32 to 122°F); 95% RH
Dimensions		143x80x38mm (5.6x3.2x1.5")
Weight		320 g (11.3 oz.)

SHOCKPROOF RUBBER BOOTS

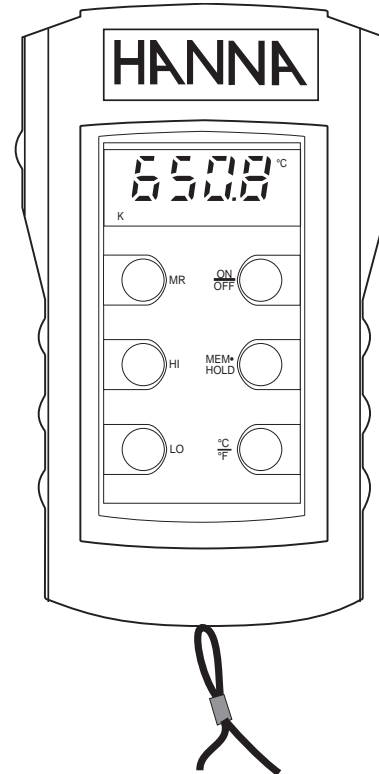
These rubber boots are specially made to prolong the life of your instruments and to prevent damage due to accidental falls.

They measure 155 x 90 x 45 mm (6.1x3.5x1.8") and are available in two different colors:

HI 710007 = blue colored

HI 710008 = orange colored.

Select the proper color according to your preference.



CALIBRATION

All Hanna Instruments thermometers have been accurately pre-calibrated at the factory. It is generally recommended to have all thermometers recalibrated at least once a year. For an accurate annual recalibration, contact your nearest Hanna Service Center.

BATTERY REPLACEMENT

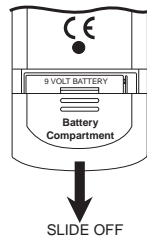
When the battery is low the user is warned by the word "BAT" (for **HI93530**, **HI93531**, **HI93532**, **HI93551**) or "Eb" (for **HI935005**, **HI935006** and **HI935007**) on the instrument's display. Replace immediately the battery.



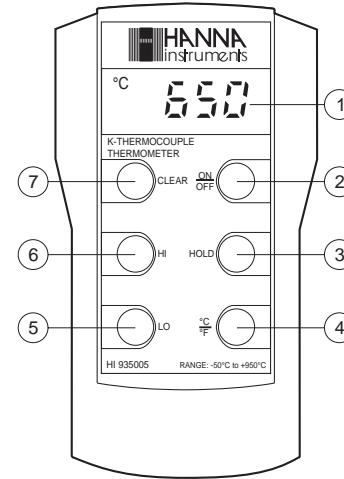
Battery replacement must only take place in a non hazardous area using a 9V battery.

Remove the battery compartment cover on the rear of the meter and replace the 9V battery with a new one. Make sure the battery contact is tight before replacing the cover.

The meter will turn on automatically when a new battery is connected. You can turn it off by pressing ON/OFF.



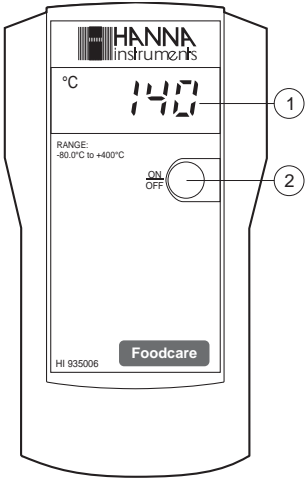
FUNCTIONAL DESCRIPTION AND SPECIFICATIONS OF HI 935005



1. Liquid Crystal Display
2. ON/OFF Key
3. Reading Hold Key
4. Measuring Scale Key (°C or °F)
5. Minimum Temperature Recalling Key
6. Maximum Temperature Recalling Key
7. HI/LO Temperature erasing key.

	Specifications
Range	-50.0 to 150.0°C / -50 to 950°C -58.0 to 302.0°F / -58 to 1742°F
Resolution	0.1°C (-50.0 to 150.0°C) 1°C (-50 to 950°C) 0.2°F (-58.0 to 302.0°F) 1°F (-58 to 1742°F)
Accuracy	±0.2% for one year, excluding probe error
Typical EMC Deviation	±3°C ±6°F
Probe	K-thermocouple (optional) (see pages 22-25)
Battery	9V/500 hrs of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	143x80x38mm (5.6x3.2x1.5")
Weight	320 g (11.3 oz.)

FUNCTIONAL DESCRIPTION AND SPECIFICATIONS OF HI 935006



- 1. Liquid Crystal Display
- 2. ON/OFF Key.

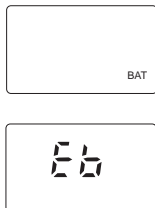
	Specifications
Range	-80.0 to 120.0°C 121 to 400°C
Resolution	0.1°C (-50 to 120°C) 1°C (120 to 400°C)
Accuracy	±0.3% for one year, excluding probe error
Typical EMC Deviation	±3°C
Probe	T-thermocouple (optional)
Battery	9V/500 hrs of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	143x80x38mm (5.6x3.2x1.5")
Weight	320 g (11.3 oz.)

DISPLAY CODES GUIDE

Display	Description
HI93530, HI93531, HI93532, HI93551:	
----	The probe is not connected to the instrument or the reading is out of range
BAT	Weak battery, needs to be replaced
HI935005, HI935006 and HI935007:	
Er	The probe is not connected to the instrument or the reading is out of range
Eb	Weak battery, needs to be replaced
HI93530, HI93531, HI93551, HI935005, HI935007:	
°C	The instrument is reading in the Centigrade scale
°F	The instrument is reading in the Fahrenheit scale
HI 93531, HI 93551 and HI 935005:	
HI	Displays the highest measured temperature
LO	Displays the lowest measured temperature
HI 93530 and HI 93551:	
HOLD	Freezes current reading on display
HI935005:	
M	Indicates the value of the temperature frozen on the display
HI 93531 and HI 93532:	
HOLD	Freezes current reading on display and stores
MEM	the reading into memory
MEM	Indicates the value of the temperature stored into memory
HI 93532:	
K1 or K2	Temperature at probe 1 or 2 respectively
Δ	Difference between temperatures at the two probes
HI 93551:	
K, J or T	Thermocouple probe type in use

LOW BATTERY DETECTION

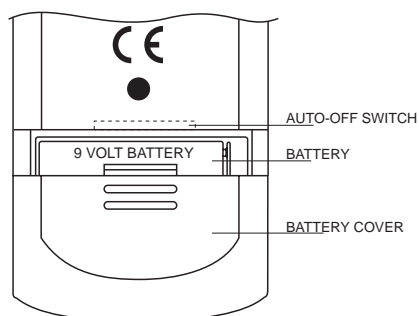
When the battery is low the user is prompted by the appearance of the word "BAT" (for **HI 93530**, **HI 93531**, **HI 93532**, **HI 93551**) or "Eb" for **HI 935005**, **HI 935006** and **HI 935007** to substitute the battery (see page 20).



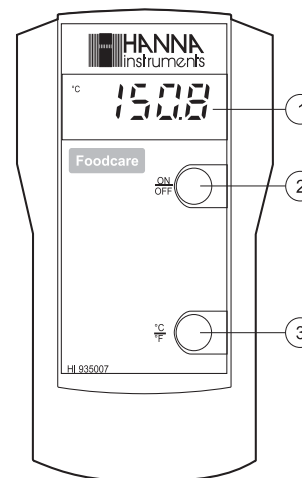
AUTO-SHUT OFF

To save battery life, **HI 935006** will switch off after 5 minutes and **HI 93530**, **HI 93531**, **HI 93532**, **HI 93551**, **HI 935005** and **HI 935007** after 60 minutes.

The switch located in the battery compartment enables this feature (for all models except of HI 935006). Remove the battery cover and slide the switch to the right. The thermometer's auto-off feature will be disabled. If the switch is to the left, the meter will shut off automatically.



FUNCTIONAL DESCRIPTION AND SPECIFICATIONS OF HI 935007



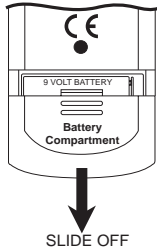
1. Liquid Crystal Display
2. ON/OFF Key
3. Measuring Scale Key (°C or °F).

	Specifications
Range	-50.0 to 150.0°C / -50 to 950°C -58.0 to 302.0°F / -58 to 1742°F
Resolution	0.1°C (-50.0 to 150.0°C) 1°C (-50 to 950°C) 0.2°F (-58.0 to 302.0°F) 1°F (-58 to 1742°F)
Accuracy	±0.2% for one year, excluding probe error
Typical EMC Deviation	±3°C ±6°F
Probe	HI766CK-thermocouple (included)
Battery	9V/500 hrs of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	143x80x38mm (5.6x3.2x1.5")
Weight	320 g (11.3 oz.)

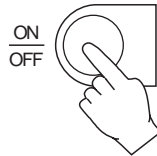
OPERATIONAL GUIDE

INITIAL PREPARATION

Remove the battery cover on the rear of your thermometer, unwrap the battery and connect it to the clip. Insert the battery in its compartment and replace the cover.



To switch on, press ON/OFF on the front of the unit.



Your thermometer will carry out a self diagnostic test. The LCD shows all the segments at once, to make sure none is missing.

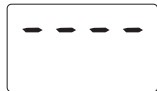


After the test, the thermometer will switch to the measurement mode.

If a temperature probe is plugged in, the unit will display the temperature.

For **HI93530, HI93531, HI93532, HI93551**

If the probe is not plugged in, the display will show "----".

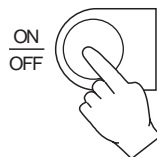


For **HI935005 and HI935006**

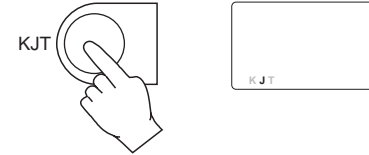
If the probe is not plugged in, the display will show "Er".



To switch your thermometer off, press ON/OFF again.



K for K-Type, J for J-Type, T for T-Type.

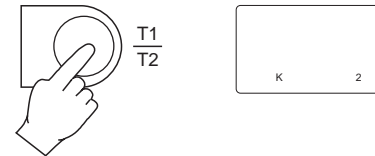


PROBE INPUT SELECTION (HI93532 only)

When switched on, the instrument automatically shows the temperature measured by Probe 1 and a "K1" appears on the LCD display.

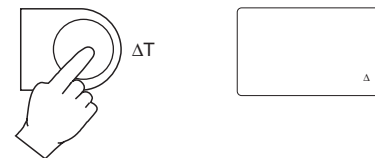


To view the input temperature of Probe 2, press T1/T2 and "K2" will be displayed.



TEMPERATURE DIFFERENCE (for HI93532 only)

The difference between the temperature measured by the two probes can be displayed by simply pressing ΔT . A " Δ " will appear on the left-hand of the display to indicate this function.

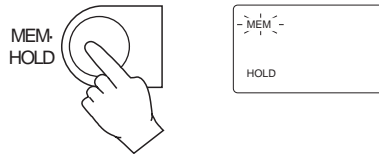


MEMORY FUNCTION (HI93531 and HI93532 only)

The memory & hold function is activated by MEM HOLD.

The measured temperature is stored in memory and frozen on the display when this function key is pressed.

The memory value will be overridden each time the memory & hold function is activated. A blinking "MEM" on display indicates the operating mode.

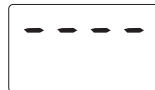


Press MR to recall previously stored temperature reading.

In this mode of operation, the display indicator "MEM" is shown.



If no data is found, "--" will be displayed.



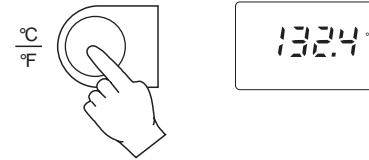
THERMOCOUPLE TYPE SELECTION (HI 93551 only)

By pressing KJT the user is allowed to set the thermometer according to the connected thermocouple type, and the related symbol will be displayed, i.e.:

MEASURING SCALE (°C/°F)(for HI93530, HI93531, HI93551, HI935005, HI935007 only)

When the meter is turned on, it automatically defaults to the °C scale. Measurements can be performed on either the Centigrade or the Fahrenheit scale.

To change the scale, press °C/°F once.

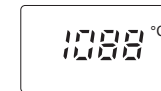


MEASUREMENT RESOLUTION

When switched on, **HI93530**, **HI93531**, **HI93532** and **HI93551** default to a 0.1 digit resolution (see specifications).

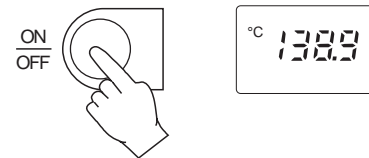


These instruments automatically change the resolution to 1 degree when the measured temperature is higher than 999.9°C (or 120°C for **HI935006**).



For **HI935005** and **HI935007** only

When switched on, **HI935005** and **HI935007** default to 1 degree resolution. Press ON/OFF again to change the resolution to 0.1°C or 0.2°F.



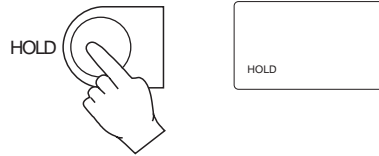
HOLD MODE (for HI93530, HI93551 and HI 935005 only)

The reading hold function is activated by the HOLD key.

For **HI93530** and **HI93551** only

To freeze the measured temperature on the display, press and hold the HOLD key.

"HOLD" is displayed when this key is pressed.

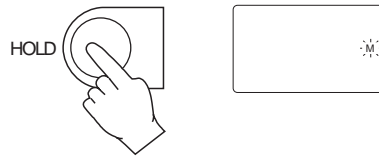


As soon as the HOLD key is released, the meter returns to the normal operational mode.

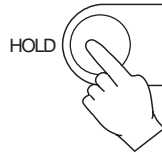
For **HI935005** only

The temperature is frozen on the display until the HOLD button is pressed a second time.

The blinking symbol "M" appears on the display when HOLD is activated.



Press HOLD again to return to the normal operational mode.



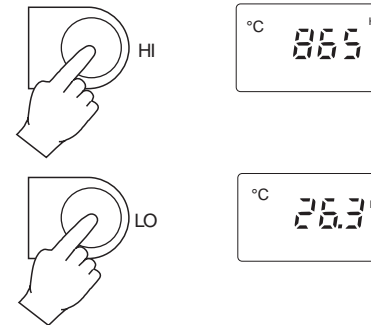
HI-LO FUNCTION (HI93531, HI93551 and HI 935005 only)

Maximum and minimum temperatures are monitored throughout a continuous measuring process.

The values may be recalled or cleared at any time during the measurement.

Check the highest or lowest measured temperature by pressing the respective HI or LO key.

The appropriate display indicator, "HI" or "LO", will light up together with the value retrieved from memory. Release the key to resume normal operation.



CLEAR HI-LO FUNCTION (HI 93531, HI 93551 and HI 935005 only)

By pressing HI and LO simultaneously (for **HI93531** and **HI93551**) or CLEAR (for **HI935005**) the present measurement reading is assigned to the highest and lowest temperature memories, i.e. both memories have equal temperature reading. The "HI" and "LO" display indicators (for **HI935005** only) will blink twice to notify the user that the clearing process is in progress.

