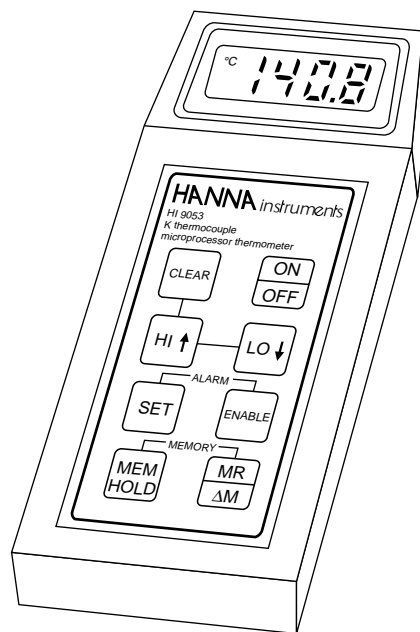


Instruction Manual

HI 9043 - HI 9044

HI 9053 - HI 9055

**Portable
Microprocessor-based
K-type Thermocouple
Thermometers**



These instruments are in Compliance with the CE Directives

 **HANNA**
instruments
<http://www.hannainst.com>



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 CE directives EN 50081-1 and EN 50082-1.

TABLE OF CONTENTS

Preliminary Examination	1
General Description	1
Functional Description of LCD	2
Functional Description of HI 9043 & HI 9044	3
Functional Description of HI 9053	4
Functional Description of HI 9055	5
Specifications	6
Operational Guide	7
Functional Operation Guide	12
Display Error Codes	14
Calibration	14
Battery Replacement	15
Accessories	16
Warranty	20
CE Declaration of Conformity	21



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 found, notify your Dealer.

Note: Save all packing material until the instrument has been observed to function correctly because all defective items must be returned to the Dealer in their original packing.

GENERAL DESCRIPTION

These microprocessor-based thermometers allow temperature measurements using K-type thermocouple probes. The non-linearity of the temperature probe is linearized by the built-in microcomputer. It also permits accurate compensation for drifts in the measurement circuit and the reference junction.

Standard features include:

- display and clearing of maximum/minimum temperature measurement
- reading hold
- memory entry (HI 9053 and HI 9055 only)
- low battery detection

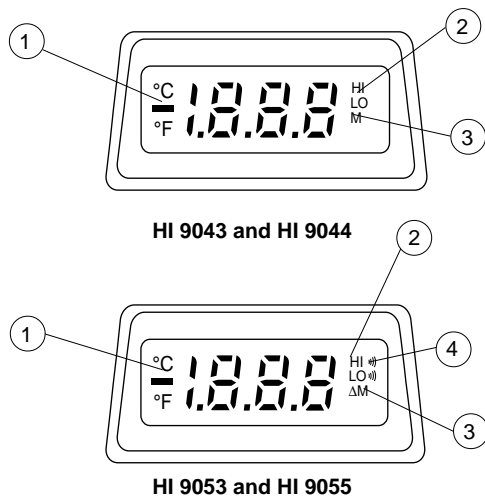
Additional functions for HI 9053 and HI 9055 include:

- sound alarm with preset operating range
- display of constantly updated temperature differential between stored and measured values.
- selectable measurement range/resolution.

These functions are easily accessible through the splash-proof membrane keypad.

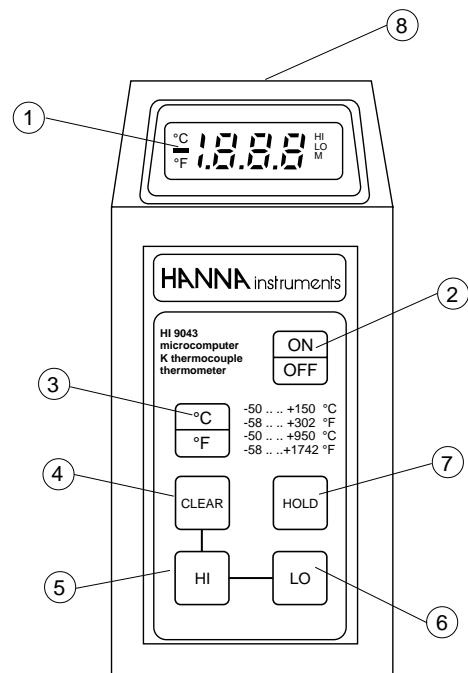
Self-explanatory symbols are used to remind the user of the operating mode or condition.

FUNCTIONAL DESCRIPTION OF LCD



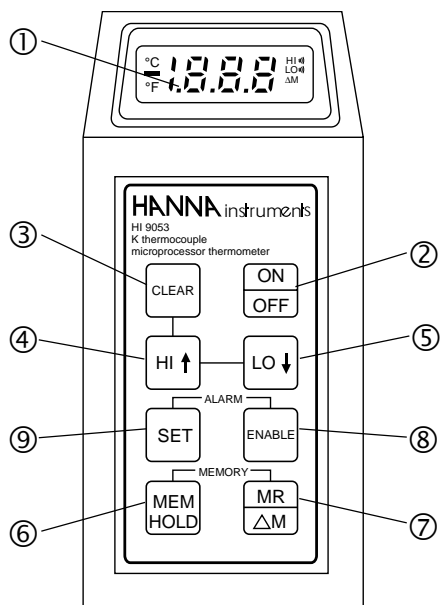
1. Measurement Scale
2. Maximum and Minimum Temperatures
3. Hold Function and Memory Content
4. Visual Alarm Signal.

FUNCTIONAL DESCRIPTION OF HI 9043 AND HI 9044



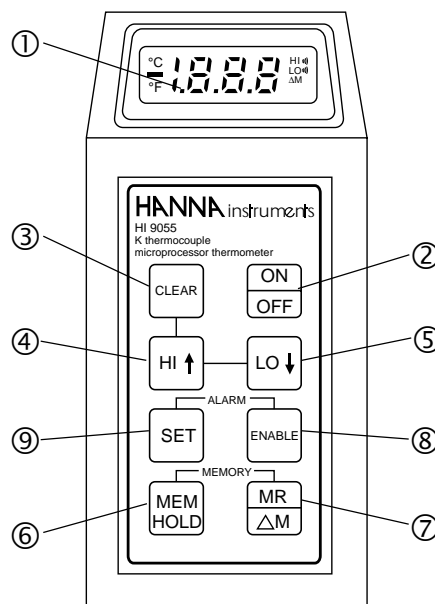
1. Liquid Crystal Display
2. ON/OFF Key
3. Measuring Scale Selection Key
4. HI/LO Temperatures Erasing Key
5. Maximum Temperature Key
6. Minimum Temperature Key
7. HOLD Measurement Key
8. Probe Connection (direct for HI 9044 only)

FUNCTIONAL DESCRIPTION OF HI 9053



1. Liquid Crystal Display
2. ON/OFF Key
3. Max./Min. Temperatures Erasing Key
4. Max. Temperature/Upper Alarm Values Key
5. Min. Temperature/Lower Alarm Values Key
6. Memory Entry and Hold Measurement Key
7. Memorized Values/Temperatures Difference Key
8. ON/OFF Alarm System Key
9. Alarm Limits Setting Key.

FUNCTIONAL DESCRIPTION HI 9055



1. Liquid Crystal Display
2. ON/OFF Key
3. Max/Min Temperatures Erasing Key
4. Max. Temperature/Upper Alarm Values Key
5. Min. Temperature/Lower Alarm Values Key
6. Memory Entry and Hold Measurement Key
7. Memorized Values/Temperatures Difference Key
8. ON/OFF Alarm System
9. Alarm Limits Setting Key.

SPECIFICATIONS

HI 9043 & HI 9044	
Range	-50.0 to 150.0°C & -50 to 950°C -58.0 to 302.0°F & -58 to 1742°F
Resolution	0.1 & 1°C 0.2 & 1°F
Accuracy	±0.5% of Full Scale for one year, excluding probe error
Typical EMC Deviation	±3 °C and ±6 °F with HI 766 K-Thermocouple probe
Probe	HI 766 K-Thermocouple series (optional for HI 9043) HI 766E2 fixed (for HI 9044)
Battery	9V / 500 hours of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	180 x 83 x 40 mm (7.1 x 3.3 x 1.6")
Weight	350 g (12.4 oz.)

HI 9053	
Range	-50.0 to 150.0°C & -50 to 950°C
Resolution	0.1 & 1°C
Accuracy	±0.5% of Full Scale for one year, excluding probe error
Typical EMC Deviation	±3 °C with HI 766 K-Thermocouple probe
Probe	HI 766 K-Thermocouple series (optional)
Battery	9V / 500 hours of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	180 x 83 x 40 mm (7.1 x 3.3 x 1.6")
Weight	350 g (12.4 oz.)

HI 9055	
Range	-58.0 to 302.0°F & -58 to 1742°F
Resolution	0.2 & 1°F
Accuracy	±0.5% of Full Scale for one year, excluding probe error
Typical EMC Deviation	±6 °F with HI 766 K-Thermocouple probe
Probe	HI 766 K-Thermocouple series (optional)
Battery	9V / 500 hours of continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	180 x 83 x 40 mm (7.1 x 3.3 x 1.6")
Weight	350 g (12.4 oz.)

OPERATIONAL GUIDE

INITIAL PREPARATION

Remove the battery cover on the rear of your thermometer (see page 15).

Unwrap the battery. Connect the battery while paying attention to the polarity and replace the cover.

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



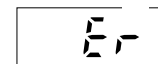
Your thermometer will carry out a self-test. The LCD shows a full set of figures during the self-test.

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

Plug a K-type thermocouple probe in and the unit will display the temperature.

Note: In **HI 9044**, the probe is directly connected.

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



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

MEASUREMENT RANGE

When switched on, the instrument defaults to the high range with resolution of 1°C/1°F.



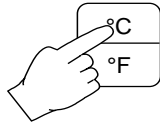
The measurement range may be changed to a higher resolution range of 0.1°C or 0.2°F by pressing the ON/OFF key again.

Note: Range switching causes all alarm setting and memories to reset.

MEASURING SCALE - °C/°F (HI 9043 & HI 9044 only)

The meter automatically defaults to the °C scale when turned on.

Measurements can be performed in either the Centigrade or Fahrenheit scale. To change the scale, press the °C/°F button once.



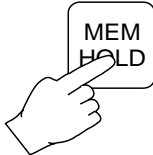
HOLD MODE

The reading hold function is activated by the HOLD (HI 9043 and HI 9044) or MEM HOLD (HI 9053 and HI 9055) key.

The measured temperature is frozen on the display when this key is pressed.

A blinking "M" on display indicates the operation mode.

By pressing this key again, the meter returns to its regular operation mode.

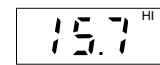
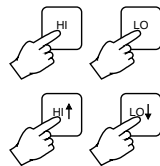


HI/LO FUNCTION

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



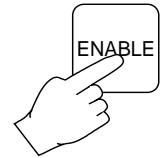
CLEAR FUNCTION

Erase the memorized highest and lowest measured values by pressing the CLEAR key. Upon depressing the CLEAR key, the present measurement reading is assigned as the highest and lowest temperature in memory, i.e. both stored temperature values are equal. The "HI" and "LO" display indicators will blink twice to notify user that the clearing process is in progress.



ALARM (HI 9053 and HI 9055 only)

During the start up the alarm is disabled. It may be enabled or disabled again by pressing the ENABLE key. Both the high and low set points are by default set at 25°C or 77°F, conforming to the model.

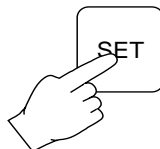


The alarm is triggered when the measured value is greater than the high set point or lower than the low set point. In such an instance, the corresponding graphics indicator blinks accompanied by a sound.

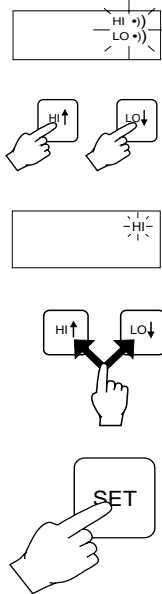
The buzzer may be turned off by pressing any key except the ON/OFF key (by pressing ON/OFF the alarm is deactivated and the scale changes).

Reactivation is possible by turning the alarm off and on again, i.e. by pressing ENABLE key (note that the set point values will not be affected by this action).

To set the alarm limits, press the SET key on the front panel.

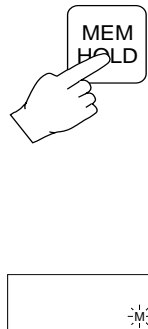


The flashing "HI-)" and "LO-)" alarm indicators request the user to opt for the set mode. Select the HI key to enter the set mode for high temperature point or the LO key for the low temperature limit. If the HI key is chosen, the low alarm indicator is switched off and the "HI" indicator appears in the top right corner of the LCD. Enter the set point value using the \uparrow and \downarrow keys. Holding the key down enables rapid change. Exit from the high alarm limit setting by pressing the SET key for a second time. The user may now proceed to set the low alarm limit or return to the measurement mode by pressing the SET key again. The setting of low temperature limit works in a similar manner.



MEMORY MODE (HI 9053 and HI 9055 only)

There are two modes of operation. The first is the memory & hold function which is activated by the MEM HOLD key. The measured temperature is captured into memory and frozen on the display when this function key is pressed. The memory content will be overridden each time the memory & hold function is activated. A blinking "M" indicates the operating mode. By pressing the same key, the display freeze is released and the meter returns to its regular operating mode.



The next memory function key, MR/ Δ M, serves two purposes:

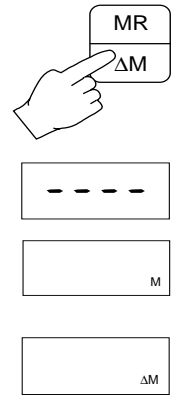
- The first entry (by pressing this key once) enables the recall of the previously stored temperature reading. If no data is found, " _ _ _ " will be displayed. In this mode of operation, the display indicator "M" is kept static.
- The " Δ M" display (by pressing MR/ Δ M twice) indicates the constant updated discrepancy between the memory content and the measured value in a continuous measuring process. Calculation is performed by subtracting the measured value from the memory content, i.e.:

$$\Delta M = (M - T)$$

where M = memory content
T = measured temperature

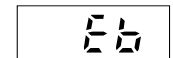
A negative result therefore represents a lower memory value.

By pressing the MR/ Δ M key once again, the user exits from the memory mode.



LOW BATTERY DETECTION

In order to avoid erroneous measurements being taken due to low voltage, the instrument shuts itself down completely when the batteries run low. The user is also prompted to change them by "Eb" on the LCD.



FUNCTIONAL OPERATION GUIDE

Function	Key	Indicator	Remarks
Lowest Temperature	LO	LO	Hold to read
Highest Temperature	HI	HI	Hold to read
Clear HI/LO memories	CLEAR	"HI/LO"	Blinks twice
Hold display and memorize it (HI 9053 and HI 9055 only)	HOLD (HI9043, HI9044)	"M"	Store current reading in memory and freeze it on display
	MEM (HI9053, HI 9055)		Release display with reading retained in memory
<i>For HI 9053 and HI 9055 only:</i>			
Memory recall	MR/ΔM	M	Recall stored memory
Temperatures Difference	MR/ΔM	ΔM	Subtract present temperature from memory content
	MR/ΔM		Return to normal code
On/Off alarm	ENABLE	HI·)) LO·))	Indicators disappear if key is pressed again
Set high alarm	SET	HI·)) LO·))	1. Waiting for selection
	HI	HI·))	2. High alarm set mode
	↑ or ↓	HI·))	3. Press either key to choose setpoint
	SET	HI·)) LO·))	4. End high alarm set mode and wait for next selection

Function	Key	Indicator	Remarks
Set High alarm	SET		5.Exit alarm setting.Activate alarm manually
Set Low alarm	SET	HI·)) LO·))	1.Wait for selection
	LO	LO·))	2.Low alarm set mode
	↑ or ↓	LO·))	3.Press either key to choose set point
	SET	HI·)) LO·))	4.End low alarm set mode and wait for next selection
	SET		5.Exit alarm setting.Activate alarm manually
Scroll up/down (for alarm setting only)	↑ or ↓		Increase or decrease display by 1 at each depression. Hold to accelerate change
Measurement Mode (HI9043 and HI9044 only)	°C/°F	°C/°F	Change scale of measurement

DISPLAY ERROR CODES

Display	Description
Er	Input temperature falls out of instrument range
Eb	Low battery error
All segments light up for more than 3 seconds	Check the connections and reset the meter by detaching the battery for 10 seconds and then reconnecting it
HI 9053 and HI 9055 only:	
HI"•) " LO"•) "	Measured value exceeds high alarm set point
HI"•) " LO"••) "	Measured value falls below alarm set point
- - - M	Memory content found empty

NOTE: "••••" represents blinking indicator

CALIBRATION

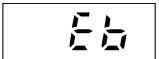
All Hanna Instruments thermometers have been accurately pre-calibrated at the factory.

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

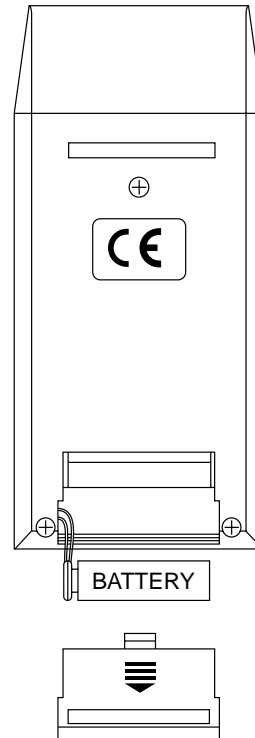
In order to avoid erroneous measurements being taken due to low voltage, the instrument shuts itself down completely when the batteries run low. The user is also prompted to change them by **"Eb"** on the LCD.



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

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

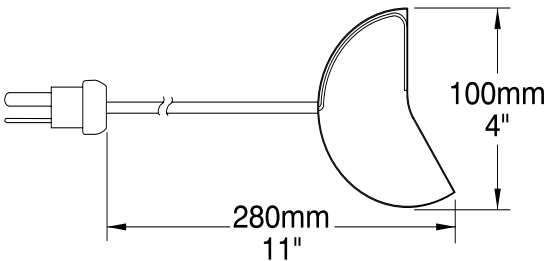
The meter will turn on automatically when a new battery is connected. You can turn it off by pressing the ON/OFF key twice.



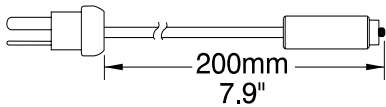
ACCESSORIES

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

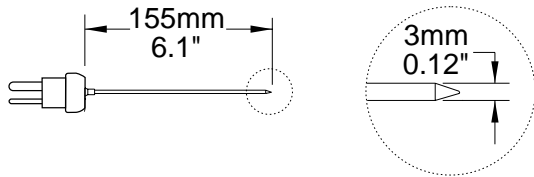
HI 766PA Roller surface probe, max 320°C/600°F



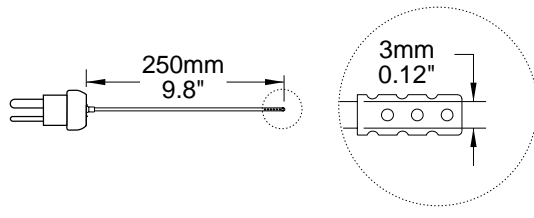
HI 766PB Surface probe, max 650°C/1200°F



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

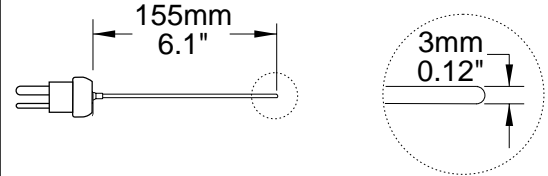


HI 766PD Air probe, max 300°C/570°F

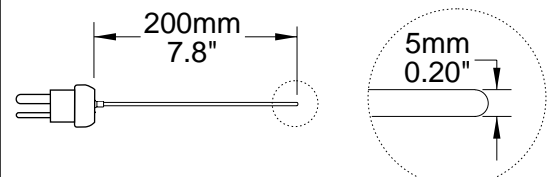


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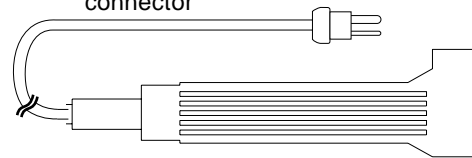
HI 766PE1 General use probe, max 900°C/1650°F



HI 766PE2 General use probe, max 900°C/1650°F

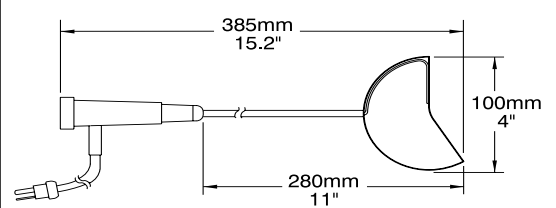


HI 766HD Rugged thermocouple probe handle with 1 m (3.3') cable fitted with a mini-connector

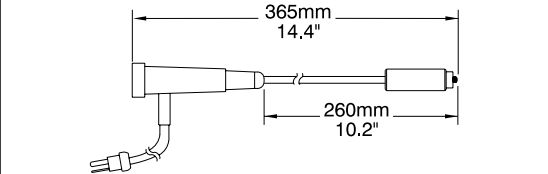


with integral handle, 1 m cable & mini-connector:

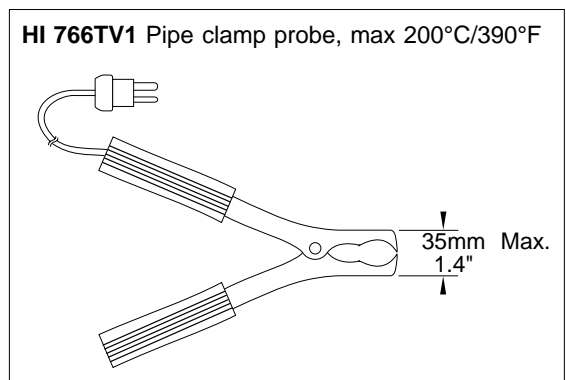
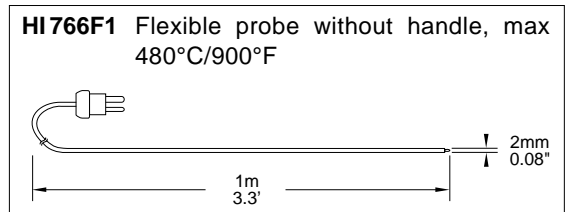
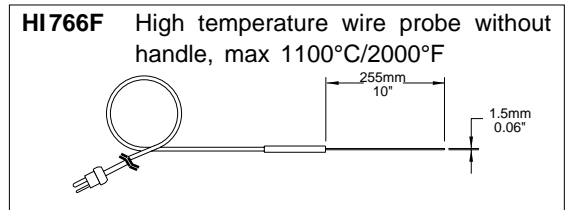
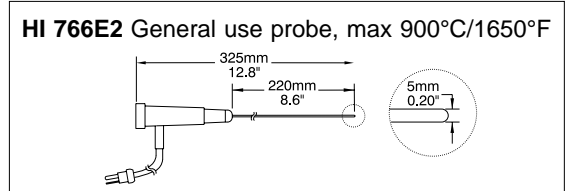
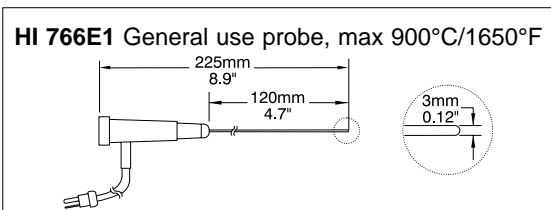
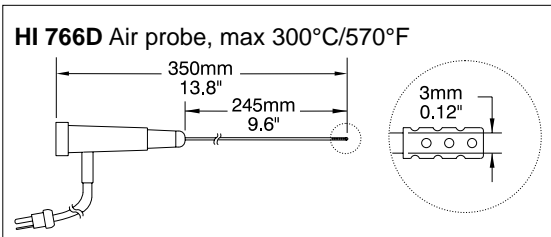
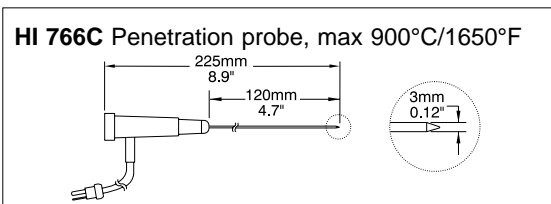
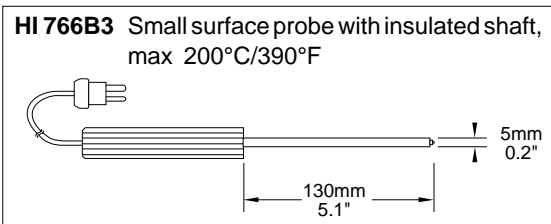
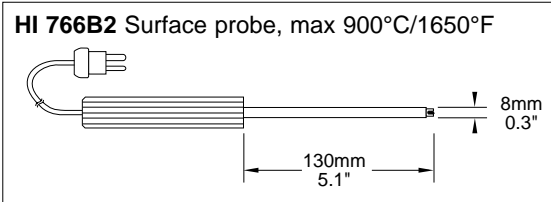
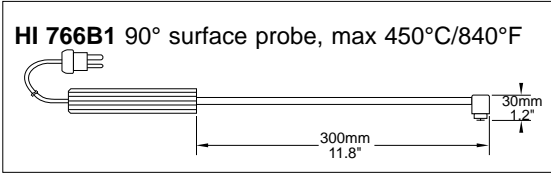
HI 766A Roller surface probe, max 320°C/600°F



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



19



Other accessories:

HI710002 Soft carrying case measuring 280 x 120 x 50 mm

HI721316 Hard carrying case measuring 340 x 230 x 90 mm and holding up to 3 temperature probes

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 accidents, 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 prepaid. 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 date of purchase.

All rights are reserved. Reproduction in whole or in part is prohibited without the written consent of the copyright owner.

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

CE DECLARATION OF CONFORMITY



DECLARATION OF CONFORMITY

We

Hanna Instruments Italia Srl
via E.Fermi, 10
35030 Sarmeola di Rubano - PD
ITALY

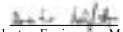
herewith certify that the thermometers:

HI 9043 HI 9044 HI 9053 HI 9055

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
EN 61010-1	User Safety Requirement

Date of Issue: 30-11-1997


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.

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.

In particular cases HI 9043 and HI 9044 may switch from °C to °F or vice-versa. In these cases they can be switched back by pressing the °C/°F key.

In particular cases HI 9053 and HI 9055 could turn off. In such cases they can be turned on by pressing the ON/OFF key.

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<http://www.hannainst.com>