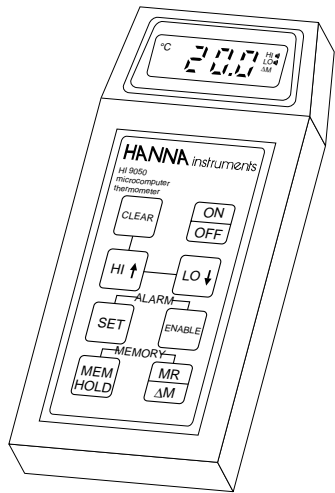


Instruction Manual

HI 9040 - HI 9041
HI 9050 - HI 9051
Portable Microprocessor
Thermistor
Thermometers



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

CE
These Instruments are in
Compliance with the CE Directives

Dear Customer,

Thank you for choosing a Hanna Product. Please read this instruction manual carefully before using the instrument. It will provide you with the necessary information for the correct use of the instrument, as well as a precise idea of its versatility.

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

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HANNA
instruments *ISO 9000 Certified
Company since 1992*

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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, contact your Dealer immediately.

All models, except HI 9041, are supplied complete with an HI 765BL temperature probe. A 9V battery is also included.

Note: Save all packing material until you are sure that the meter functions correctly. Any damaged or defective item must be returned in its original packing with the supplied accessories.

GENERAL DESCRIPTION

HI 9040, HI 9041, HI 9050 and HI 9051 are microprocessor-based thermometers which allow temperature measurement using a calibrated thermistor probe. The temperature probe is linearized by the built-in microprocessor.

HI 9041 has been specifically designed by Hanna Instruments for use in the food industry.

Standard features include:

- display and clearing of maximum/minimum temperature measurements
- memory entry and hold
- low battery detection

Additional functions (HI 9050 and HI 9051) include:

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

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.

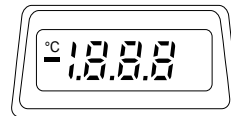
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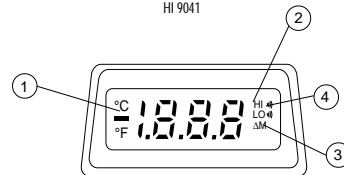
FUNCTIONAL DESCRIPTION LCD



HI 9040



HI 9041



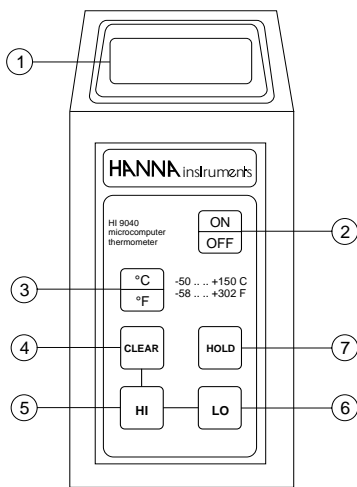
HI 9050 and HI 9051

- 1) Measuring Scale
- 2) Maximum and Minimum Temperature Indicators
- 3) Hold and Memory Indicator
- 4) Alarm Indicators.

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FUNCTIONAL DESCRIPTION HI 9040

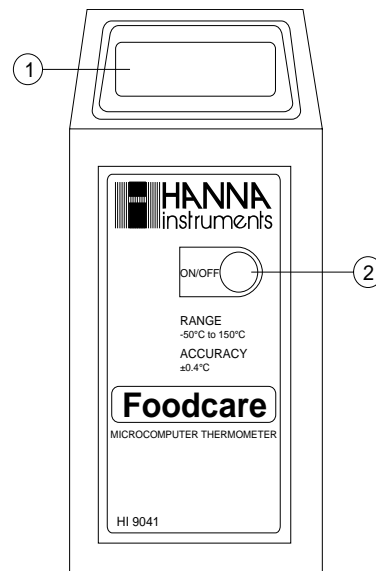


- 1) Liquid Crystal Display
- 2) ON/OFF Key
- 3) Range Selection Key
- 4) Max./Min. Reset Key
- 5) Maximum Temperature Key
- 6) Minimum Temperature Key
- 7) HOLD Measurement Key.

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FUNCTIONAL DESCRIPTION HI 9041

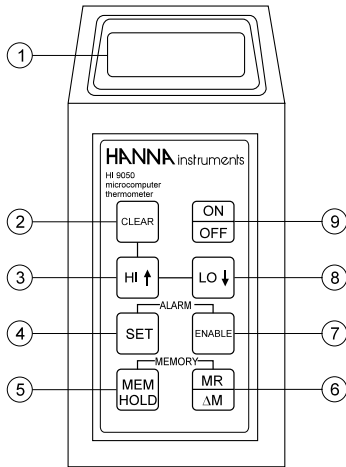


- 1) Liquid Crystal Display
- 2) ON/OFF Key.

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FUNCTIONAL DESCRIPTION
HI 9050 & HI 9051



- 1) Liquid Crystal Display
- 2) Max/Min Reset Key
- 3) Max. Temperature/Upper Alarm Value Key
- 4) Alarm Limits Selection Key
- 5) Memory Entry and Hold Measurement Key
- 6) Memory Recall/Temperature Differential Key
- 7) Activate/Deactivate Alarm Key
- 8) Min. Temperature/Lower Alarm Value Key
- 9) ON/OFF Key.

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SPECIFICATIONS

	HI 9040
Range	-50.0 to 150.0°C -58.0 to 302°F
Resolution	0.1°C 0.2°F (-58.0 to 199.8°F) / 1°F (200 to 302°F)
Accuracy (@20°C/68°F)	±0.4°C / ±0.8°F for one year, excluding probe error
Typical EMC Deviation	±0.5°C / ±1°F with HI 765BL probe
Probe	HI 765BL with 1 m (3.3') cable (included)
Battery	9V / approx. 300 hours of continuous use
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing
Dimensions	180 x 83 x 40 mm (7.1 x 3.3 x 1.6")
Weight	350 g (12.4 oz)

	HI 9041
Range	-50.0 to 150.0°C
Resolution	0.1°C
Accuracy (@20°C/68°F)	±0.4°C for one year, excluding probe error
Typical EMC Deviation	±0.5°C with HI 765BL probe
Battery	9 V / 300 approx. hours of continuous use
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing
Dimensions	180 x 83 x 40 mm (7.1 x 3.3 x 1.6")
Weight	350 g (12.4 oz)

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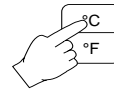
	HI 9050
Range	-50.0 to 150.0°C
Resolution	0.1°C
Accuracy (@20°C/68°F)	±0.4°C for one year, excluding probe error
Typical EMC Deviation	±0.5°C with HI 765BL probe
Probe	HI 765BL with 1 m (3.3') cable (included)
Battery	9V / 300 approx. hours of continuous use
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing
Dimensions	180 x 83 x 40 mm (7.1 x 3.3 x 1.6")
Weight	350 g (12.4 oz)

	HI 9051
Range	-58.0 to 199.8 & -58 to 302°F
Resolution	0.2 & ±1°F
Accuracy (@20°C/68°F)	±0.8°F for one year, excluding probe error
Typical EMC Deviation	±1°F with HI 765BL probe
Probe	HI 765BL with 1 m (3.3') cable (included)
Battery	9V / 300 approx. hours of continuous use
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing
Dimensions	180 x 83 x 40 mm (7.1 x 3.3 x 1.6")
Weight	350 g (12.4 oz)

OPERATIONAL GUIDE

MEASURING SCALE - °C/°F (HI 9040 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 (except for HI 9041)

The hold function is activated by either the HOLD (HI 9040) or HOLD/MEM (HI 9050 and HI 9051) key. The measured temperature is frozen on the display when this key is pressed. A blinking "M" on display indicates the operational mode. By pressing the key one more time, the meter returns to measurement mode.

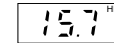


HI/LO FUNCTION (except for HI 9041)

The maximum and minimum temperatures are continuously monitored. The contents may be recalled and/or cleared at any time during measurement.



Enquires of the highest or lowest temperature measured may be made by pressing and holding down 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.



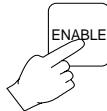
CLEAR FUNCTION (except for HI 9041)

Upon pressing the CLEAR key, the memory is cleared and the present measurement reading is assigned to the highest and lowest temperature memories, i.e. the temperature reading is equal for both memories. The "HI" and "LO" display indicators will blink twice to alert the user.



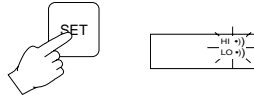
ALARM (HI 9050 and HI 9051 only)

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 setpoints are by default set to 25°C (or 77°F).

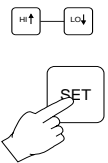
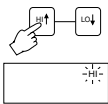


The alarm is triggered when the measured value is greater than the high setpoint or lower than the low setpoint. In such an instance, the corresponding graphics indicator blinks accompanied by an audible sound. The beeper may be turned off by pressing any key except the ON/OFF key (The ON/OFF key will turn the unit off and clear the memory). It will automatically be reactivated once the alarm condition is cleared. Reactivation is also possible by turning the alarm off and on again. Note that the setpoint values will not be affected by the on-off action.

To set the alarm limits, press the SET key. The flashing "HI →)" and "LO ←)" alarm indicators request the user to select the limits.



Press the HI key to enter set mode for high temperature point or the LO key for low temperature limit. If the HI key is chosen, the low alarm indicator is switched off leaving the "HI" indicator blinking with its graphics indicator held static. Enter the setpoint value with the ↑ and ↓ keys. Holding the keys 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 SET again. The setting of low temperature limit works in a similar manner. In case of improper setpoint entries, a continuous false alarm beeper will sound.



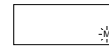
MEMORY MODE (HI 9050 and HI 9051 only)

There are two modes of operation.

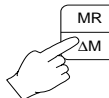
The first is the Memory & Hold function which is activated by the MEM HOLD key. The measured temperature is memorized and frozen on the



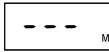
display when this key is pressed. The previously memorized temperature will be overridden in this case. A blinking "M" on the display indicates the operating mode. Press the MEM/HOLD Key again to revert back to regular operating mode.



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



- The first entry enables recall of the latest memorized temperature. If no data is found, "..." will be displayed and the subsequent function will be aborted on the next key entry. In this mode, the "M" indicator also appears on the bottom right corner of the LCD.



- The "ΔM" symbol indicates the constantly updated difference between the memory content and the current temperature being measured. 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

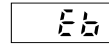
A negative result therefore represents a lower memorized value.

Press the MR/ΔM key once again to exit this mode.

While in the memory mode, other functions such as HI, LO and Alarm remain active.

LOW BATTERY DETECTION

The instrument stops operating when a low battery condition is detected. The user is warned by "Eb" displayed on the LCD.



FUNCTIONAL OPERATION GUIDE

Function	Key	Indicator	Remarks
Lowest Temperature	LO	LO	Hold down LO to read
Highest Temperature	HI	HI	Hold down HI to read
Clear HI/LO memories	CLEAR	"HI/LO"	Blinks Twice
Hold and Memory (HI 9050 and HI 9051 only)	HOLD (HI 9040) HOLD/MEM (HI 9050 and HI 9051)	"M"	Store reading in memory and freeze it on display Press again to release display with reading retained in memory
<i>For HI 9050 and HI 9051 only:</i>			
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 adjust setpoint
	SET	HI •) LO •)	4.End high alarm set mode and wait for next selection
	SET	HI •) LO •)	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 setpoint
	SET	HI •) LO •)	4.End low alarm set mode and wait for next selection
	SET	HI •) LO •)	5.Exit alarm setting. Activate alarm manually
Scroll up/down (for alarm setting only)	↑ or ↓		Increase or decrease display by 0.1 steps. Hold to accelerate change
Memory recall	MR/ΔM	M	Recall stored memory
Temperatures Differential	MR/ΔM	ΔM	Subtract present temperature from memory content
Measurement Mode (HI9040)	MR/ΔM	°C/°F	Return to normal code Toggle between °C and °F

DISPLAY CODES

Display	Description
Er	Probe disconnected or temperature out of range
Eb	Low battery error
All segments light up for more than 3 seconds	Out of range or no probe connected to the instrument
<i>HI 9050 and HI 9051 only:</i>	
HI •) LO •)	Measured value exceeds HI alarm setpoint
HI •) LO •)	Measured value falls below LO alarm setpoint
- - - M	Empty memory

CALIBRATION

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

It is, however, recommended to have all thermometers recalibrated at least once a year. For an accurate annual recalibration, contact your nearest Hanna Service Center.

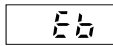
Hanna Test Plugs provide a quick and easy way to test the meter's accuracy by simply connecting these Test Plugs to the probe connector of the meter. If the reading differs by more than ±0.4°C (±0.8°F) from the Test Plug value, the unit is due for recalibration. Choose the Test Plug closest to your measurement range to best suit your needs:

- HI 765-18C Calibration key, -18.0°C ±0.4°C
- HI 765000C Calibration key, 0.0°C ±0.4°C
- HI 765070C Calibration key, 70.0°C ±0.4°C
- HI 765-004F Calibration key, -0.4°F ±0.8°F
- HI 765032F Calibration key, 32.0°F ±0.8°F
- HI 765158F Calibration key, 158.0°F ±0.8°F



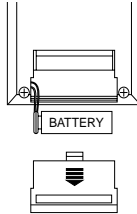
BATTERY REPLACEMENT

The instrument stops operating when the low battery signal is detected. The user is warned of this by the code "Eb".



Battery replacement should only take place in a non-hazardous area using an alkaline 9V battery.

Remove the battery cover at the rear of the meter and replace the 9V battery with a new one. Press in the battery contacts to make sure they are properly inserted before replacing the cover.



TEMPERATURE PROBES & ACCESSORIES

Hanna Instruments offers a wide range of probes to meet all your requirements from liquids to air and penetration. These probes use highly sensitive thermistor sensors which provide greater accuracy, faster response and a temperature range that is superior to conventional thermistor probes.

All Hanna temperature probes are supplied pre-calibrated from the factory and are ready to be used with your meter. The probes are easily to your meter with a standard connector.

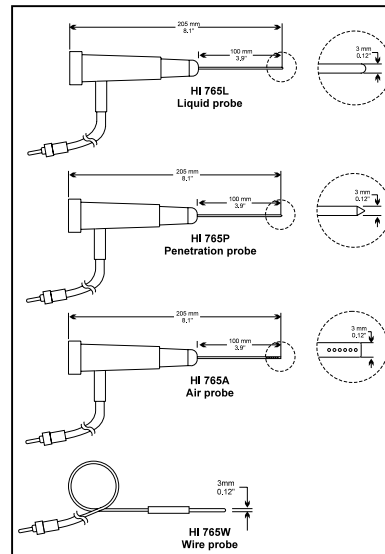
Completely interchangeable, these probes make it possible for you to switch from one to another without wasting time and money going through time-consuming and tedious calibration procedures.

The probes are available in different colors to avoid cross contamination during testing:

- HI 765A Air probe, with 1 m (3.3') cable and white handle
- HI 765A/10 Air probe, with 10 m (33') cable and white handle
- HI 765BL General purpose liquid probe, with 1 m (3.3') cable and black handle
- HI 765BL/10 General purpose liquid probe, with 10 m (33') cable and black handle
- HI 765L General purpose liquid probe, with 1 m (3.3') cable and white handle
- HI 765L/10 General purpose liquid probe, with 10 m (33') cable and white handle
- HI 765PBL Penetration probe with 1 m (3.3') cable and blue handle

- HI 765PBL/10 Penetration probe with 10 m (33') cable and blue handle
- HI 765PG Penetration probe with 1 m (3.3') cable and green handle
- HI 765PG/10 Penetration probe with 10 m (33') cable and green handle
- HI 765PR Penetration probe with 1 m (3.3') cable and red handle
- HI 765PR/10 Penetration probe with 10 m (33') cable and red handle
- HI 765PW Penetration probe with 1 m (3.3') cable and white handle
- HI 765PW/10 Penetration probe with 10 m (33') cable and white handle
- HI 765W Wire probe, without handle (hard-to-reach places) with 1 m cable
- HI 765W/10 Wire probe, without handle (hard-to-reach places) with 10 m cable

HANNA INSTRUMENTS TEMPERATURE PROBES



OTHER ACCESSORIES

- HI 710002 Soft carrying case (formerly BORGIM)
- HI 710009 Blue rubber boot
- HI 710010 Orange rubber boot
- HI 710031 Hard carrying case (formerly PKGCASE)
- HI 721310 9V Battery (10 pcs)
- MAN40R2 Instruction Manual

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 6 months.

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

Damage 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 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 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.

OTHER PRODUCTS FROM HANNA


- CALIBRATION AND MAINTENANCE SOLUTIONS
- CHEMICAL TEST KITS
- CHLORINE METERS
- CONDUCTIVITY/TDS METERS
- DISSOLVED OXYGEN METERS
- HYGROMETERS
- ION SPECIFIC METERS (Colorimeters)
- MAGNETIC STIRRERS
- NaCl METERS
- pH/ORP/Na ELECTRODES
- pH/ORP/Na METERS
- PUMPS
- REAGENTS
- SOFTWARE
- PROBES (DO, μ S/cm, RH, T, TDS)
- TITRATORS
- TRANSMITTERS
- TURBIDITY METERS
- Wide Range of Accessories

Most Hanna meters are available in the following formats:

- BENCH-TOP METERS
- POCKET-SIZED METERS
- PORTABLE METERS
- PRINTING/LOGGING METERS
- PROCESS METERS (Panel and Wall-mounted)
- WATERPROOF METERS
- METERS FOR FOOD INDUSTRY

For additional information, contact your dealer or the nearest Hanna Customer Service Center. You can also e-mail us at: tech@hannainst.com.

CE DECLARATION OF CONFORMITY



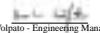
CE
DECLARATION OF CONFORMITY

We
Hanna Instruments Srl
Via delle industrie 12
35010 Ronchi di Villafranca (PD)
ITALY

herewith certify that the thermometers
HI 9040 HI 9041 HI 9050 HI 9051
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: 30-11-1995



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 areas could cause unacceptable interference to radio and TV equipment, 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 60VDC.

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

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

HANNA LITERATURE



LAB RECORDING



WATER ANALYSIS HANDBOOK



ENVIROCARE



GENERAL CATALOG

PRINTED IN PORTUGAL

These and many others catalogs, handbooks and leaflets are available from Hanna. To receive your free copy, contact your dealer or the nearest Hanna Customer Service Center.

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<http://www.hannainst.com>