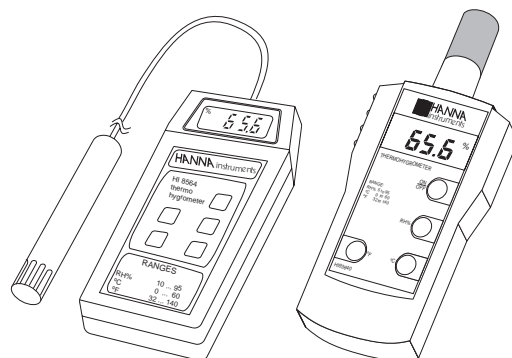


Instruction Manual

**HI 8564
HI 93640**

**Portable
Thermo-Hygrometers**



HANNA
instruments
Manufacturers since 1978

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 CE directives.

TABLE OF CONTENTS

Preliminary Examination	1
General Description	1
Functional Description of HI 8564	2
Functional Description of HI 93640	3
Specifications of HI 8564	4
Specifications of HI 93640	5
Operational Guide	6
Calibration	8
Battery Replacement	12
Shockproof Rubber Boots	13
Accessories	14
Warranty	15
CE Declaration of Conformity	17



PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it to make sure that no damage has occurred during shipping. If there is any damage, notify your Dealer.

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

GENERAL DESCRIPTION

HI 8564 and **HI93640** portable Thermo-Hygrometers measure both Temperature and Relative Humidity.

HI93640 is a compact, easy to carry meter with a convenient wrist-wrap. The built-in thin film capacitance sensor assures accurate humidity measurements from 5.0 to 95.0% RH with a resolution of 0.1%.

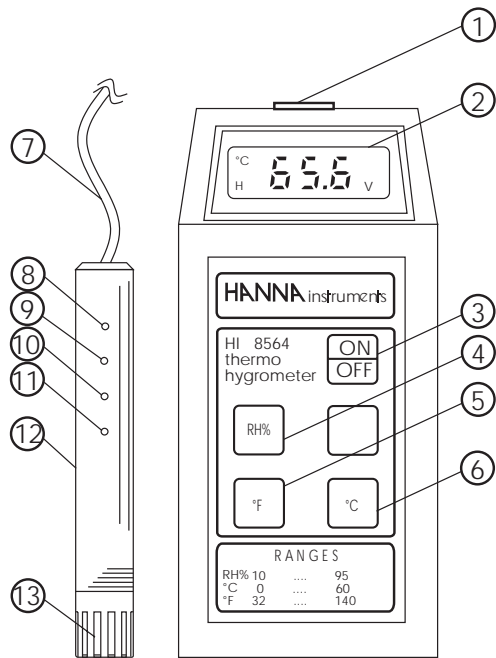
The RH probe contains both the sensor and the electronic circuitry necessary to amplify the RH as well as the temperature readings. Another electronic circuit converts the amplified signal into a digital readout in % Relative Humidity.

Note: The RH probe sensor must never come into contact with water or other liquids.

HI8564 comes supplied with: HI70601/2, detachable relative Humidity probe and a 9V battery.

HI93640 comes supplied with a 9V battery.

FUNCTIONAL DESCRIPTION OF HI8564

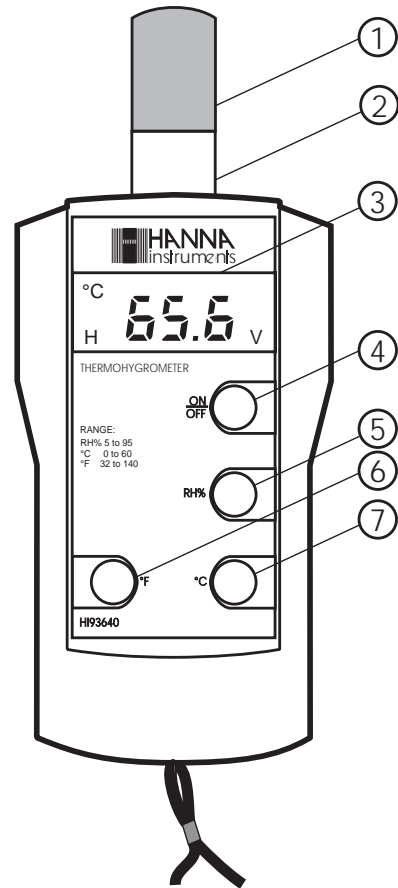


- 1) DIN socket for Relative Humidity/Temp. Probe
- 2) Liquid Crystal Display
- 3) **ON/OFF** Key (to turn the meter on or off)
- 4) **RH%** Key (to display RH measurements)
- 5) **°F** Key (to display Temperature in Fahrenheit)
- 6) **°C** Key (to display Temperature in Centigrade)
- 7) Shielded Cable
- 8) Low RH Trimmer
- 9) Low Temperature Trimmer
- 10) High RH Trimmer
- 11) High Temperature Trimmer
- 12) Polypropylene Probe Body
- 13) Protective Cover (to prevent damage to sensor)

Display Indicators:

- "°C" (to indicate Temperature readings in degrees Centigrade)
- "H" (to indicate Relative Humidity readings)
- "V" (to indicate that battery needs to be replaced)

FUNCTIONAL DESCRIPTION OF HI93640



- 1) Detachable filter cap (HI936CAP)
- 2) Built-in RH/Temp. probe
- 3) Liquid Crystal Display
- 4) **ON/OFF** Key (to switch on/off)
- 5) **RH%** Key (to display RH measurements)
- 6) **°F** Key (to display Temperature in Fahrenheit)
- 7) **°C** Key (to display Temperature in Centigrade)

Display Indicators:

- "°C" (to indicate Temperature readings in degrees Centigrade)
- "H" (to indicate Relative Humidity readings)
- "V" (to indicate that battery needs to be replaced)

SPECIFICATIONS OF HI 8564

RANGE	RH °C °F	10.0 to 95.0% 0.0 to 60.0 32 to 140
RESOLUTION	RH °C °F	0.1% 0.1 1
ACCURACY (@20°C/68°F)	RH °C °F	±2% ±0.4 ±1 for one year, excluding probe error
TYPICAL EMC DEVIATION	RH °C °F	±2% ±0.5 ±1
OPERATING CONDITIONS		0 to 50 °C (32 to 122 °F) 98% RH max.
BATTERY		One 9V, 100 hours of continuous use, with low battery indicator
DIMENSIONS	Meter Probe	185 x 82 x 45 mm (7.3" x 3.2" x 1.8") L:165 mm D:25 mm with 2 m cable (L:6.5" D:1" 7' cable)
WEIGHT	Meter Probe	315 g (11.1 oz.) 200 g (7 oz.)

SPECIFICATIONS OF HI 93640

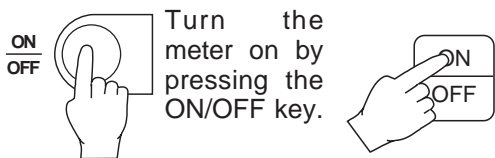
RANGE	RH °C °F	5.0 to 95.0% 0.0 to 60.0 32 to 140
RESOLUTION	RH °C °F	0.1% 0.1 1
ACCURACY (@20°C/68°F)	RH °C °F	±2% ±0.4 ±1 for one year excluding probe error
TYPICAL EMC DEVIATION	RH °C °F	±3% ±0.4 ±0.8
OPERATING CONDITIONS		0 to 50°C (32 to 122°F) 98% RH max.
BATTERY		One 9V, 100 hours of continuous use, with low battery indicator
DIMENSIONS		190 x 80 x 38 mm (7.5 x 3.1 x 1.5")
WEIGHT		320 g (11.3 oz.)

OPERATIONAL GUIDE

INSTRUMENT PREPARATION

Each meter is supplied complete with a 9V battery. Slide off the battery compartment cover on the back of the meter (see page 12), unwrap the battery and install it.

To prepare **HI8564** for use connect the RH probe to the DIN socket on the top of the meter.



Using the HI8564 or HI93640 thermo-hygrometer is simple. However, the recommendations below should always be followed.

RELATIVE HUMIDITY MEASUREMENTS

- The end of the humidity detector should be exposed to a current of air moving at 0.5 m (20") per second or more.
- In the absence of air movement, the response can be accelerated by moving the probe.
- The probe sensor must never come into contact with water or other liquids. If this should happen, or if condensation causes drops to form on the surface of the humidity sensor, turn off the instrument and wait until the liquid has evaporated completely. In order to accelerate the evaporation process, the humidity sensor could be exposed to a current of air.

For HI93640 only: in order to obtain a faster response, the sintered filter should

be removed. Whenever the probe is to be used in a dusty or smoky environment, the filter must be kept on at all times.

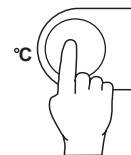
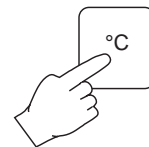
TEMPERATURE MEASUREMENTS

Simply press the °C or °F keys to take the temperature readings directly from the same probe.

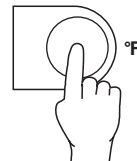
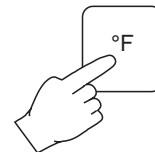
Note: Press °C key to display the temperature in °C.

"°C" is displayed when measuring temperature in degrees Centigrade.

EXAMPLE: A temperature reading taken in degrees Centigrade would read:



Press °F key to read the same value in degrees Fahrenheit:



If you experience any problems in taking measurements, please contact your dealer or the nearest Hanna Instruments Customer Service Department.

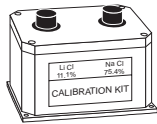
CALIBRATION

All Hanna hygrometers have been precalibrated at the factory. Hanna Instruments uses state-of-the-art thermal humidity chambers for this purpose. It is generally recommended to have all hygrometers recalibrated at least once a year.

For an accurate annual recalibration, contact your nearest Hanna Service Center.

You can also check the status of your **HI 8564** and perform a quick recalibration (with an accuracy of $\pm 5\%$) by using the Hanna mini-calibration chambers **HI 7101**.

The kits are composed of two thermally isolated chambers, each one equipped with a threaded cap and three bottles containing the appropriate precalibrated saturated salts to produce a known RH value.



Preparing the Calibration Solutions (HI 8564 only):

- Pour approximately 26 cc of distilled water into a glass container.



- Immerse this container into a bath of ice and water and shake briefly.

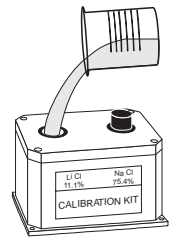


- Slowly add the contents of a **HI 7111** bottle containing LiCl into the glass container while continuing to shake.

- When the salt has dissolved completely, add all the content of the second bottle of **HI 7111**.

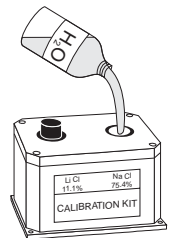


- Allow the solution obtained to cool, and then pour it into the chamber marked "RH 11.1%", making sure that no residue remains on the walls of the glass container.

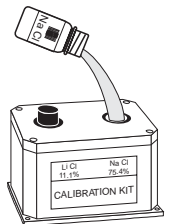


- Seal the chamber well when not in use, as the LiCl solution is extremely hygroscopic and tends to capture the humidity present in the air causing the solution to expand in volume and to overflow from the container.

- Pour approximately 12 cc of distilled water into the other chamber marked "RH 75.4%".



- Add all the content of the **HI 7121** bottle containing NaCl while continuously shaking the container to avoid the formation of lumps. Seal this container well when not in use.



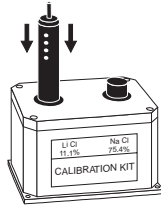
The calibration kit needs 4 hours for stabilization.



RH Calibration Procedure (HI 8564 only):

- Bring the calibration kit to a temperature of approximately 20°C.

- Remove the cap from the "RH 11.1%" chamber containing the LiCl solution and insert the probe paying attention not to tip it into the liquid.



- Remove the adhesive sticker which covers the calibration trimmer access holes.

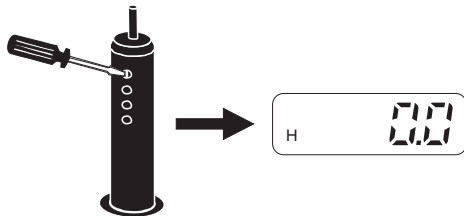
- Press the ON/OFF key to switch the instrument on.



- Wait for the measurement to stabilize (this takes about 4 hours).

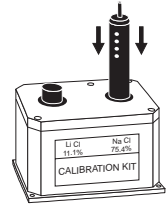


- Turn the low humidity trimmer (see Functional Description) until a value of 0.0% is seen on the readout (reading between 0.0% and 1.0% RH is also acceptable).



- Remove the probe and tightly seal the chamber containing the LiCl solution.

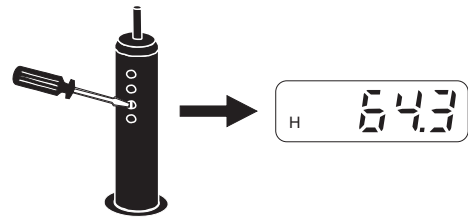
- Remove the cap from the "RH 75.4%" chamber containing the NaCl solution and insert the probe.



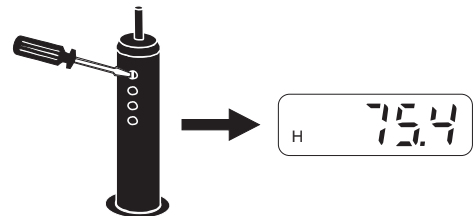
- Wait for the measurement to stabilize (approximately 4 hours)



- Turn the high humidity trimmer until the readout on the display is 64.3%.



- Wait for 1 hour and readjust if necessary.
- Leaving the probe in the "RH 75.4%" chamber, adjust the low humidity trimmer until the value of 75.4% is read.

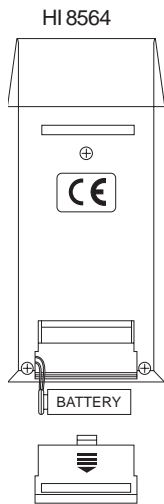


- Now, the humidity calibration is complete.

Spare saturation salts are also available: HI 7111/P (LiCl) for low range humidity, and HI 7121/P (NaCl) for high range humidity.

BATTERY REPLACEMENT

Battery replacement must only take place in a non hazardous area using the battery types specified in this instruction manual (see page 14).



FOR HI8564 ONLY:

When the battery is run down "V" is displayed on the LCD to warn the user.

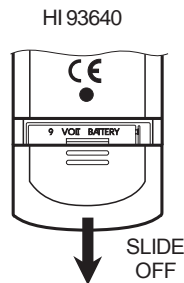
In order to replace the battery, simply slide the cover off and replace it with a new 9V battery.

FOR HI93640 ONLY:

When the battery is rundown "V" is displayed on the LCD to warn the user.

HI93640 employs the advanced "BEPS" technology. BEPS will detect a low power condition and will shut the display off. If the ON/OFF button is pressed again, the meter will shut off after a few seconds. When this occurs, replace the 9V battery with a new one.

When the battery is exhausted or the instrument cannot be switched on, simply slide the battery cover off from the rear of the instrument and replace with the 9V battery with a new one.



SHOCKPROOF RUBBER BOOTS

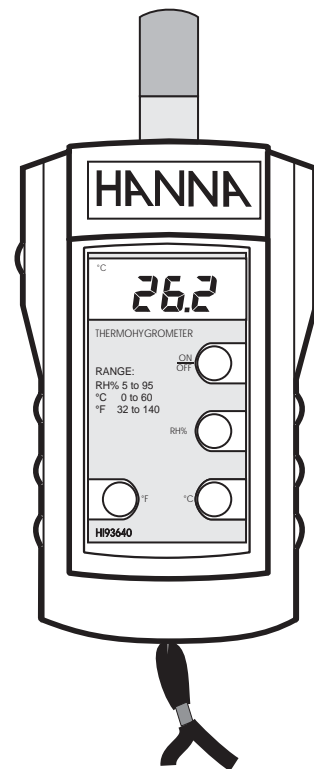
These rubber boots for HI 93640 are specially made to prolong the life of your meter and to prevent damages due to accidental dropping.

This rubber boot measures 155 x 90 x 45 mm (6.1 x 3.5 x 1.8") and is available in two different colors:

HI710008 = orange

HI710007 = blue.

Select the proper color according to your preference.



ACCESSORIES

HI70601/5	Detachable interchangeable TFPC RH & temp. probe for HI 8564 with 5 m (16.5') cable
HI 710001	Soft carrying case (for HI 8564 only)
HI 710007	Blue rubber boot (for HI 93640 only)
HI 710008	Orange rubber boot (for HI 93640 only)
HI710011	Spare sintered cap for protection (for HI 93640 only)
HI 710031	Rugged carrying case
HI7101	Calibration chambers for HI 8564 , complete with O-ring and pre-calibrated saturated salts
HI7111/P	Spare saturation salts 6 x 15g bottles of LiCl for low range humidity calibration
HI7121/P	Spare saturation salts 6 x 33g bottles of NaCl for high range humidity calibration
HI721310	9V battery (10 pcs)
MANRHR2	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 the instructions. The **probes are warranted for a period of six months**.

Damages due to accidents, misuse, tampering or lack of prescribed maintenance are not covered. This warranty is limited to repair or replacement free of charge.

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 charge for repair or replacement.

If the instrument is to be returned to Hanna Instruments, obtain a Return Goods Authorization from the Customer Service Department first and then send it with shipment cost 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.


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.

OTHER PRODUCTS FROM HANNA

- Chemical Test Kits
- Conductivity and TDS Meters
- Dissolved Oxygen Meters
- Dosing Pumps
- Electrodes (pH and ORP)
- Hygrometers
- Ion Specific Meters
- Magnetic Stirrers
- pH Meters
- Printing and Logging Meters
- Process Instrumentation
- Solutions and Accessories
- Testers (pH, conductivity, temperature, pNa, TDS, ORP)
- Thermometers

CE DECLARATION OF CONFORMITY



CE
DECLARATION OF CONFORMITY

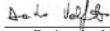
We
Hanna Instruments Srl
V.le delle industrie 12
35010 Ronchi di Villafranca (PD)
ITALY

herewith certify that the thermo-hygrometers
HI 8564 **HI 93640**

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

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

Date of Issue: 12-10-1995


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 area could cause unacceptable interferences to radio and TV equipments, requiring the operator to take all necessary steps to correct interferences.

In HI 8564 the trimmers are sensitive to Electrostatic Discharge. It is recommended to use an antistatic screwdriver during calibration.

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

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

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

HANNA LITERATURE

Hanna publishes a wide range of catalogs and handbooks for an equally wide range of applications. The reference literature currently covers areas such as:

- Water Treatment
- Process
- Swimming Pools
- Agriculture
- Food
- Laboratory
- Thermometry

and many others. New reference material is constantly being added to the library.

For these and other catalogs, handbooks and leaflets, contact your dealer or the Hanna Customer Service Center nearest to you. To find the Hanna Office in your vicinity, check our home page at www.hannainst.com.

MANRHR2
03/00



<http://www.hannainst.com>