

Model 407445
Heavy Duty Hygro-Thermometer

- Displays Temperature & Relative Humidity simultaneously
- High precision, capacitance RH probe
- Record / Recall MAX/MIN/AVG Readings
- PC Interface and Software

**1. INTRODUCTION**

Congratulations on your purchase of Extech's Heavy Duty Hygro-Thermometer. This professional meter, with proper care, will provide years of safe reliable service.

2. SPECIFICATIONS**2.1 General Specifications**

Circuit	Custom LSI microprocessor circuit
Display	Dual function, 0.5" super large LCD display with contrast adjustment
Measurement	Relative Humidity (RH) and Temperature (°C & °F)
Data Hold function	Freezes Display
Sensor Structure	Humidity - thin film, capacitance sensor Temperature - thermistor
Memory Recall	Records/Recalls Max, Min and Average readings
Power off	Automatic power down to preserve battery life
Data Output	RS 232 PC serial interface
Sampling Time	Approximately 0.8 seconds
Operating Temperature	Instrument: 32 to 122F (0 °C to 50 °C) Probe: 32 °F to 140 °F (0 °C to 60 °C)
Operating Humidity	< 90% RH
Power Supply	006P DC 9V battery (Heavy duty Alkaline type)
Power Current	Approx. 8.5 mA DC
Weight	0.76 lbs. (345 g) including batteries & probe
Size	Instrument: 7.1 x 2.8 x 1.3" (180 x 72 x 32mm) Sensor Head: Round, 26mm diameter x 160mm

2.2 Range Specifications

	Range	Resolution	Accuracy
RH	10% to 95% RH	0.1% RH	$\geq 70\%$ RH: $\pm(3\% \text{ rdg} + 1\% \text{ RH})$; $<70\%$ RH: $\pm 3\% \text{ RH}$
Temperature	0°C to 50 °C 32 °F to 122 °F	0.1 °C 0.1 °F	$\pm 0.8^\circ\text{C}$ $\pm 1.5^\circ\text{F}$

3. FRONT PANEL DESCRIPTION

1. Humidity Display
2. Temperature Display
3. ON/OFF key
4. RECORD key
5. RECALL key
6. RS-232 output jack
7. Sensor input jack
8. Sensor head
9. LCD contrast adjustment
10. Temperature units select
11. Data Hold key
12. Sensor handle



4. OPERATION

- 4.1 Install the "Sensor Plug" into the "Sensor Input Socket".
- 4.2 Press "Power Off/On" to turn the instrument power "ON".
- 4.3 Select the temperature units by pressing "°C/°F". The display will indicate "°C" or "°F" as selected.
- 4.4 The meter will now display up-to-the-minute humidity and temperature.
- 4.5 As humidity values of the environment change, it takes a few minutes to obtain a stable RH reading.

NOTE: For accurate Relative Humidity measurements the meter should be allowed to stabilize for several minutes in order to adapt to the ambient temperature of the area where the test is taking place. Also, the probe should be held from the cable end when making measurements.

4.6 Data Hold:

While taking measurements, pressing "Data Hold" will freeze the displayed value and the LCD will display the "D.H" indicator. Press "Hold" again to release the data hold function.

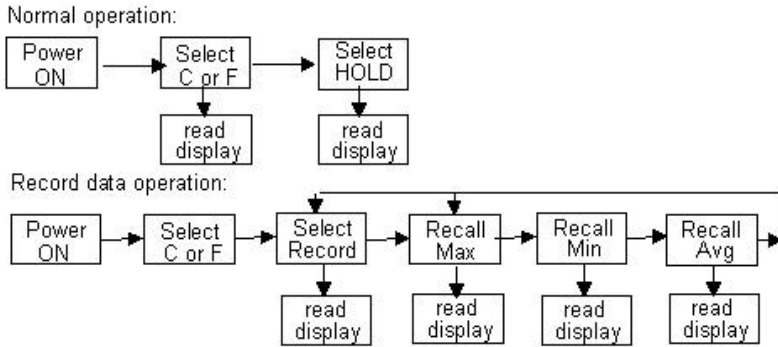
4.7 Data Record (Max., Min., and Average RH reading):

When selected, the DATA RECORD function records and stores the max, min and average readings. To start the DATA RECORD function:

- a) Press "RECORD" once. The "REC" indicator will appear on the display.
- b) Press "RECALL" once to enter the "Max" mode. The "Max" indicator along with the maximum reading recorded since the "RECORD" key was first pressed will appear on the LCD display.
- c) Press "RECALL" once, the "Min" indicator along with the minimum reading recorded since the "RECORD" key was first pressed will appear on the LCD display.

- d) Press "RECALL" once, the "AVG" indicator along with the average value will appear on the LCD display.
- e) To disable the "Data Record" function, press "Record" again. The display indicators "REC", "Max", "Min", "AVG" will disappear.

4.8 Simplified operational flow diagrams:



5. MEASUREMENT CONSIDERATION

- 5.1 The meter is designed with an "Auto shut off" feature to preserve battery life. The meter will automatically shut down after 10 minutes of non-use. To disable this feature, press the "RECORD" key to engage the record function.
- 5.2 It may be necessary to adjust the display contrast due to a change in viewing angle or voltage drift. Use the "LCD Contrast adjustment" located on the right side of the meter to set the preferred contrast.

6. RS232 DATA BUS OUTPUT

The meter is designed with a built-in RS232 serial data port. This interface was designed to operate with the Extech Data Acquisition Software (p/n 407000) and enables the user to capture, store and display readings on a PC. For more information, contact Extech or refer to the manual accompanying the software for details on the interface.

7. BATTERY REPLACEMENT

- 7.1 The low battery indication appears as a "LBT" on the left corner of the display. When the "LBT" appears, replace the battery as soon as possible. Reliable readings can be obtained for several hours after the first appearance of the low battery indication.
- 7.2 To replace the battery:
 - a) Remove the battery compartment cover using a small coin or screwdriver and remove the battery.
 - b) Replace with a new 9V battery (heavy duty type) and reinstall the cover.
 - c) Make sure the battery cover is secured after changing the battery.

8. HUMIDITY CALIBRATION

Note: Calibration reference solutions are available from Extech (33%: Part No. 407453 and 75%: Part No. 407465).

- 8.0 The grid located on top of the probe must be removed so that the probe may fit into the calibration bottles.
- 8.1 Prior to calibrating, allow the meter and probe to stabilize to room temperature, which may take 30 minutes or more.
- 8.2 Remove the battery from the battery compartment to provide access to the calibration adjustments.
- 8.3 Place the sensor head into a 33% calibration reference solution. Wait for a stable reading (up to 30 min). Adjust VR3 (see Fig.2) until the display shows 33.0.
- 8.4 Place the sensor head into a 75% calibration reference solution. Wait for a stable reading (up to 30 min). Adjust VR4 (Fig. 2) until the display shows 75.0.
- 8.5 Repeat steps 8.3 and 8.4 until no further adjustment is required.
- 8.6 The other adjustments available are:
 - VR7 - Temperature ($^{\circ}$ C) zero adjustment
 - VR6 - Temperature ($^{\circ}$ C) gain adjustment

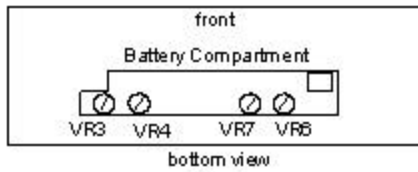


Fig. 2

9. CALIBRATION / REPAIR SERVICES

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

10. WARRANTY

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for three years from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

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