EXTECH®

Digital Psychrometer

Models RH300 and PHT-771

Introduction

Thank you for selecting the Extech RH300 Digital Psychrometer. This device measures Relative Humidity, Air Temperature from the internal sensor (T1), and Temperature from the TP890 optional external probe (T2).
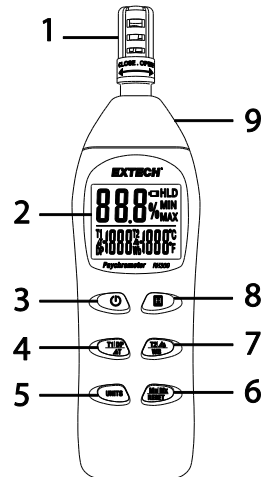
The RH300 calculates **Dew Point** and **Wet Bulb** temperature based on T1 air temperature measurements and relative humidity measurements. The meter also calculates **T1 minus T2** temperature and **T2 minus Dew Point** temperature.

Product features include Data Hold, adjustable automatic power-off (APO) and MIN/MAX recording. Careful use of this meter will provide years of reliable service.

Visit our website to check for the latest version of this user manual: www.extech.com.

Meter Description

1. Relative humidity and T1* air temperature sensors
2. Triple-reading LCD
3. Power ON/OFF button
4. Button for T1 temperature / T1 minus T2* temperature (ΔT) / Dew Point temperature (DP)
5. °F/°C temperature unit select button
6. MIN/MAX recording control button
7. Button for T2 external probe temperature / T2 temperature minus Dew Point temperature (🔺) / Wet Bulb temperature (Wb)
8. Data Hold button
9. Jack for optional TP890 temperature probe (T2)

Note: Battery compartment is located on back meter

*T1 *represents the displayed air temperature measured by the internal sensor.* **T2** *represents the displayed temperature measured by the optional (external) temperature sensor (TP890).* **Dew Point** *and* **Wet Bulb** *temperatures are calculations based on T1 air temperature and relative humidity measurements.*

Button Descriptions

⏻	Press for 1 second to power ON or OFF
H	Short press to freeze/unfreeze displayed readings
T1|DP ▲T	Short press to step through T1 internal sensor temperature, Dew Point temperature, and T1 minus T2 (external probe) temperature
T2 ▲▲ WB	Short press to step through T2 external probe (TP890) temperature, T2 temperature minus Dew Point temperature, and Wet Bulb temperature
UNITS	Short press to toggle temperature units (ºC/ºF)
Mn Mx RESET	Short presses to step through minimum reading, maximum reading, and to exit. Long press to reset the MIN MAX memories.

Display Description

1. Relative Humidity %
2. T1* (air temperature, internal sensor)
3. T1 temperature minus T2* (optional external probe TP890) temperature
4. Dew Point* temperature calculation
5. Wet Bulb* temperature calculation
6. T2 temperature minus Dew Point temperature calculation
7. °C/°F temperature units
8. T2 temperature (optional probe)
9. Maximum reading
10. Minimum reading
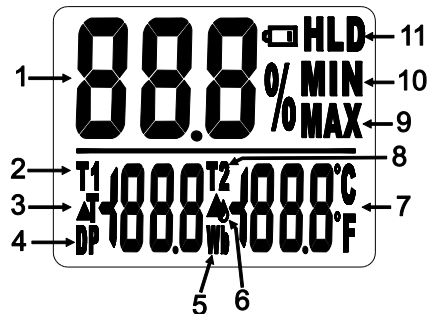11. Low Battery 🔋 and Data Hold (HLD) icons

*T1 represents the displayed air temperature measured by the internal sensor. **T2** represents the displayed temperature measured by the optional (external) temperature sensor (TP890). **Dew Point** and **Wet Bulb** temperatures are calculations based on T1 air temperature and relative humidity. T1 minus T2 and T2 minus Dew Point temperature displays are only available when you connect a TP890 optional temperature probe.*

RH300-en-GB_v2.0 10/18

Operation

Sensor Protective Cap

Turn the protective cap (top of meter), in the direction of the OPEN arrow to allow air into the sensor cavity. Turn the cap in the direction of the CLOSE arrow to protect the sensors. Always open the cap to take measurements and close when storing.
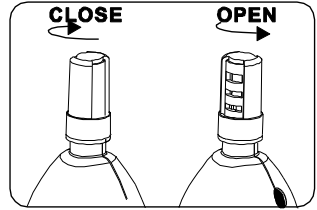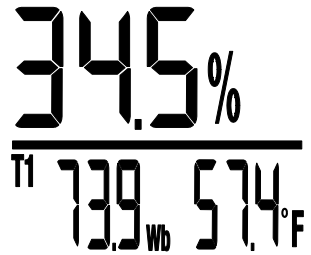
Meter Power

Press the power button for one second to switch the meter ON/OFF. The meter will perform a short self-test when switched ON.

Air Temperature and Relative Humidity Measurements

1. Turn the protective sensor cap (top) to the OPEN position to expose the sensors.
2. Hold meter so that the sensors are in the test area.
3. Allow adequate time for readings to stabilize.
4. The Relative Humidity measurement (%) appears on the top display.
5. Short press $\overset{\text{T1}|\text{DP}}{\blacktriangle\text{T}}$ to toggle T1 temperature or Dew Point temperature on the lower left display area.
6. The Wet Bulb temperature calculation (Wb) appears on the lower right.

Optional External Probe (TP890) Temperature Measurements

Connect the TP890 optional temperature probe to the jack on the right side of the meter. The TP890 is a thermistor-type temperature probe.

Short press $\overset{\text{T1}|\text{DP}}{\blacktriangle\text{T}}$ to step through three options that appear on the lower left display area: T1 temperature, T1 minus T2 temperature (ΔT), and Dew Point (DP) temperature.

Short press $\overset{\text{T2}\blacktriangle\blacktriangle}{\text{WB}}$ to step through three options that appear on the lower right: T2 temperature (TP890 optional probe), T2 minus Dew Point temperature (▲▲), and Wet Bulb (Wb) temperature.

Note: If the optional temperature sensor is not connected, $\blacktriangle\text{T}$, ▲▲, and T2 values will not be displayed.

Selecting Temperature Measurement Units

Long press the **UNITS** button to toggle the temperature measurement units (ºC and ºF).

RH300-en-GB_v2.0 10/18

Minimum (MIN) Maximum (MAX) Recording

Short press the **MnMx/Reset** button to view the minimum temperature and humidity readings recorded (**MIN** is shown). Short press the **MnMx/Reset** button again to view the maximum temperature and humidity readings recorded (**MAX** icon is shown). To exit the MIN/MAX mode, press the **MnMx/Reset** button again (**MIN** and **MAX** icons switch off).

To clear the MIN/MAX memory, long press the **MnMx/Reset** button until all display characters switch on.

Data Hold

Short press the **H** (hold) button to freeze/unfreeze the displayed readings. The '**HLD**' icon will appear on the display when data hold is active.

Automatic Power-off (APO)

The meter automatically switches off after a programmed amount of time. The default time is 10 minutes. To program the APO timer, long press the **H** button while switching the meter on. Continue to hold both the power and **H** buttons. The meter will cycle through the selectable timer values: n, 2, 5, 10, 20, 40 or 60 minutes ('n' disables APO). When the desired power-off time appears on the display, release both buttons to confirm the time and to return to the normal operating mode.

Note that the 'n' (APO defeat setting) only appears the first time through the APO time cycle in the programming process, so if you want to disable the APO you will have to catch the 'n' on the first cycle. If you miss it the first time, switch the meter OFF and retry.

Calibration

For the following verification and calibration procedures, you will need the 33% and 75% RH reference bottles (supplied with the RH305 kit). To obtain reference bottles please contact Extech (www.extech.com). If the salt in the reference bottles is overly dry, please replace the bottles (RH300-CAL).

Accuracy Verification

Checking the 33% or 75% RH Calibration:

1. Insert the meter sensor into the 33% or 75% salt reference bottle.
2. Check the reading after 10 minutes.
3. Verify that the reading is within the accuracy specification.

Relative Humidity Calibration (33% and 75%)

Preparation

- Install a fresh set of batteries.
- Move the protective sensor cap to the *Open* position.
- Switch the meter ON and set it to display Dew Point temperature (*DP)* and Wet Bulb temperature (*Wb)*.

Procedure

1. Follow the preparation steps above before continuing.
2. If the salt at the bottom of the reference bottles appears dry, replace the bottles.
3. Switch the meter OFF.
4. Insert the meter sensor into a 33% salt bottle.
5. Leave the meter OFF for one hour (to stabilize).
6. After the meter has stabilized for one hour:
   - Press and hold the UNITS button while switching the meter ON.
   - The meter will enter the calibration mode (32.8% flashes on the display).
   - The *DP* and *Wb* display fields show DP ---- Wb ----°C.
7. When the 33% calibration is complete, the display stops flashing and shows a constant 32.8%.
8. Keeping the meter switched ON, insert the sensor into the 75% salt bottle.
9. Allow the meter to remain for one hour in the 75% salt bottle to stabilize.
   Important: Do NOT switch the meter OFF while in the Calibration mode!
   While in the Calibration mode, APO is disabled.
10. After one hour, press and hold the MN/MX button until *75.3%* begins flashing on the meter display. The meter has now entered the 75.0% calibration stage.
11. After 30 minutes, the meter will exit the calibration and return to normal operating mode.
12. The Calibration is now complete; please switch the meter OFF.

Maintenance

Cleaning and storage

1. Clean the meter housing with the sensor cap closed, using a lightly damp cloth and mild detergent when necessary. Do not use solvents or abrasives.
2. Store the meter -- with the protective cap closed -- in an area with moderate temperature and humidity (refer to the operating/storage conditions specifications).

Battery Replacement

When the batteries need replacing, the ▭ symbol will appear on the LCD. Replace the two (2) 1.5 'AAA' batteries in the rear battery compartment, observing correct polarity.

Never dispose of used batteries or rechargeable batteries in household waste. As consumers, users are legally required to take used batteries to appropriate collection sites, the retail store where the batteries were purchased, or wherever batteries are sold.

Disposal: Do not dispose of this instrument in household waste. The user is obligated to take end-of-life devices to a designated collection point for the disposal of electrical and electronic equipment.

Other Battery Safety Reminders
- Never dispose of batteries in a fire. Batteries may explode or leak.
- Never mix battery types. Always install new batteries of the same type.

Error Message Displays

1. **ER1**: Relative Humidity measurement failure. Have the meter repaired or replaced.
2. **ER2**: Internal temperature circuit failure. Have the meter repaired or replaced.
3. **ER3**: Reference resistance failure. Have the meter repaired or replaced.
4. **ER4**: Internal temperature sensor measurement is out of range. Always measure within the published specified range.
5. **ER5**: External temperature sensor measurement is out of range. Always measure within the specified range of the optional TP890 external temperature sensor.

Specifications

	Range and Resolution	Accuracy
Humidity	0.0 to 100.0% RH	±3% RH (10 to 90%) @ 23ºC
Temperature (internal sensor)	-20 to 50ºC (-4.0 to 122.0ºF)	±1ºC (±1.8ºF)
Temperature (optional external probe TP890)	-20 to 70ºC (-4.0 to 158.0ºF)	±1ºC (±1.8ºF)

Display	Triple-reading LCD
Sensor Types	Relative Humidity: Precision capacitance sensor
	Temperature (internal): Thermistor
	Optional TP890 Temperature probe: Thermistor
Response Time	60 seconds typical
Dew Point range	-68 to 50ºC (-90.4 to 122.0ºF) (calculated from RH and air temperature measurements)
Wet Bulb range	-21.6 to 50ºC (-6.88 to 122.0ºF) (calculated from RH and air temperature measurements)
Operating Conditions	-20 to 50ºC (-4 to 122ºF); < 99% RH non-condensing
Storage Conditions	-40 to 85ºC (-40 to 185ºF); <99% RH non-condensing
Power Supply	2 x 1.5V 'AAA' batteries
Battery Life	Approx. 80 hours
Dimensions / Weight	178.5 x 48.8 x 25.2mm (7.0 x 1.9 x 1.0"); 140g (4.9 oz.)