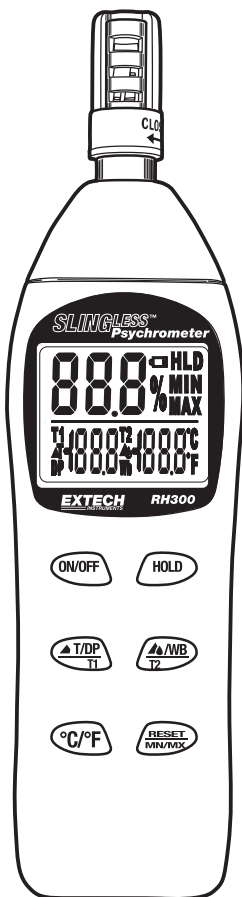# EXTECH® INSTRUMENTS

# Digital Psychrometer

Models RH300 and RH305 (kit)

Introduction

Congratulations on your purchase of the Extech RH300 Digital Psychrometer. This device measures Humidity, Air Temperature, Dew Point temperature and Wet Bulb temperature. Advanced features include External Temperature Measurement (with optional probe), Data Hold, selectable Auto Power Off, and MAX/MIN/Average reading. Careful use of this meter will provide years of reliable service.

Meter Description

1. Humidity Sensor & Air Temperature Sensor
2. Triple LCD Display
3. ON/OFF button
4. T1-T2/Dew Point/T1 button
5. °F/°C select
6. MIN/MAX/RESET button
7. T2-DP/Wet Bulb/T2 button
8. HOLD button
9. T2 Probe Jack

Note: The battery compartment is located on the rear of the instrument
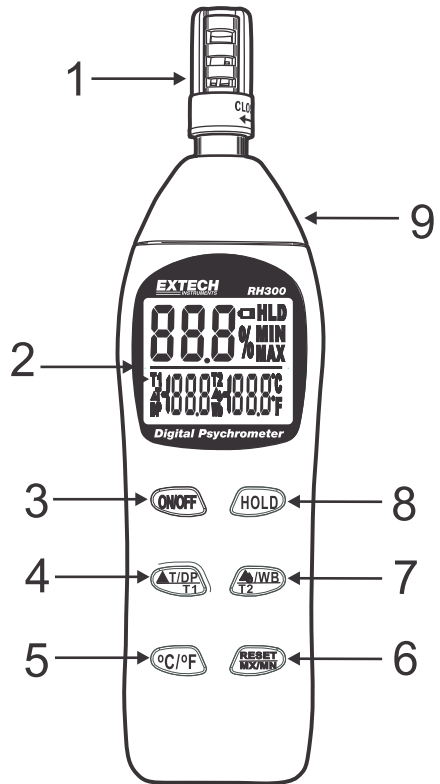
Display Description

1. Relative Humidity %
2. T1
3. T1-T2
4. Dew Point
5. Wet Bulb
6. T2-Dew Point
7. °C/°F
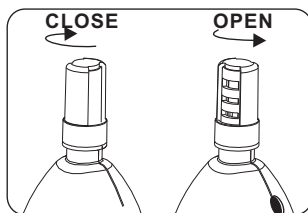8. T2
9. Maximum
10. Minimum
11. Low Battery/Hold
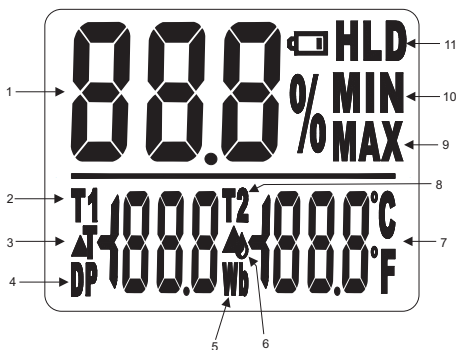
Operation

Open the Protective Sensor Cap

Twist the protective sensor cap, located at the top of   the meter, counter-clockwise a quarter of a turn to expose   the sensor

Plug in the optional external temperature probe (if needed).

Turn Power ON or OFF

Press the ON/OFF button to turn power on or off. The meter will perform a short self-test when turned on.

Taking measurements

1. Hold the probe in the area to be tested.
2. Allow adequate time for readings to stabilize.
3. The Relative Humidity measurement appears in the top display.
4. Pressing the ▲T/DP T1 button toggles the lower left display between T1-T2 (internal temperature-external temperature), DP (Dew Point), and T1 (internal temperature).
5. Pressing the ▲/WB T2 button toggles the lower right display between T2-DP (external temperature-Dew Point), WB (Wet Bulb), and T2 (external temperature).
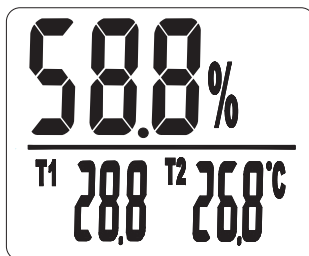
**Note:** If the external probe is not connected, T1-T2, T2-DP, and T2 measurements will not be displayed.

Selecting temperature units of measure (C/F)

Press and hold the **°C/°F** button momentarily to toggle the temperature units.

Wet Bulb and Dew Point measurements

1. To read the Wet Bulb measurement, press the ▲/WB/T2 button until the symbol **Wb** appears in the lower right display. Note: T2 will not be displayed unless the external probe is connected.
2. Wet Bulb temperature is now displayed.
3. To read the Dew Point measurement, press the ▲T/DP/T1 button until the symbol **DP** appears in the lower left display .
4. Dew Point temperature is now displayed.

Minimum (MIN) Maximum (MAX) Function

The MIN/MAX mode allows the user to view only the lowest (**MIN**) or highest (**MAX**) readings. Press the MX/MN RESET button once and **MIN** appears on the display. The display is now showing the lowest humidity and temperature reading in memory. Press the MX/MN RESET button again and **MAX** appears on the display. The display is now showing the maximum humidity and temperature readings in memory. To exit the MIN/MAX mode, press the MX/MN RESET button again and the **MIN** and **MAX** icons disappear. To clear the current min/max readings in memory, press and hold the MX/MN RESET button for more than two seconds.

Data Hold

Press the **HOLD** button momentarily to freeze the displayed reading. The '**HLD**' icon will appear on the upper right-hand side of the display. Press the **HOLD** button again to return to normal operation.

Automatic Power OFF

The meter automatically shuts off after a programmed period of time. The default time is 10 minutes. To program the time period, press down the **HOLD** button while turning the meter on. Continue to hold down both buttons and the meter will cycle through the selectable power-off times: n, 2, 5, 10, 20, 40 or 60 minutes. "n" disables the auto power off function. When the desired power-off time appears in the display, release both buttons to select the time and return to normal operation.

Error Messages

An error message will appear on the display if the meter fails an internal diagnostic test.

1. **ER1**: Relative Humidity failure. Repair/replacement is necessary.
2. **ER2**: Internal temperature failure. Repair/replacement necessary.
3. **ER3**: Reference resistance failure. Repair/replacement necessary.
4. **ER4**: Internal temperature is out of range.
5. **ER5**: External temperature is out of range.

Calibration

The following verification and calibration procedures require the 33% and 75% RH reference bottles which are supplied with the Model RH305 kit.

Accuracy Verification

Checking the 33% or 75% RH Calibration:

1. Insert meter's 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%)

Calibration Preparation

- Ensure that fresh batteries are installed in the meter.

- Move the protective vent cap to the *Open* position.

- Power the meter ON and set it to display dew point (*DP)* and wet bulb (*Wb)* in the lower display area.

Calibration Procedure

1. Follow the Preparation steps above before continuing.

2. Power the meter OFF.

3. Insert the meter into a 33% salt bottle.

4. Leave the meter OFF for one hour (to stabilize).

5. After the meter has stabilized for one hour:

    - Press and hold the °C/°F button while powering the unit ON.

    - The unit enters calibration mode (32.8% flashes on the display).

    - The DP and Wb display areas show DP ---- Wb ----°C.

6. Once the 33% calibration is complete, the display stops flashing and a constant 32.8% is displayed.

7. Allow the meter to remain ON and move it to the 75% salt bottle.

8. Allow the meter to remain for one hour in the 75% salt bottle to stabilize.

    Important: Do NOT power the meter OFF while in the Calibration mode! Note that AUTO POWER OFF is disabled while in the Calibration mode.

9. 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.
10. After 30 minutes have elapsed, the meter will automatically exit the calibration mode and return to the normal operating mode.
11. The Calibration is complete, turn power OFF.

Note: To exit from the calibration procedure before completion, press the **ON/OFF** button.

Note: If the salt at the bottom of the calibration bottles appears dry, the bottles should be replaced.

Maintenance

Cleaning and storage

1. The meter should be cleaned with a damp cloth and mild detergent when necessary. Do not use solvents or abrasives.
2. Store the meter in an area with moderate temperature and humidity (refer to the operating and storage range in the specifications chart earlier in this manual).

Battery Replacement

When the battery power falls low, the symbol will appear on the LCD. Replace the two (2) 1.5 'AAA' batteries by removing the rear battery compartment cover and accessing the battery compartment. Observe correct polarity when placing the batteries in the compartment. Ensure that the compartment cover is securely fastened when finished.

 EU Directive: 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

o Never dispose of batteries in a fire. Batteries may explode or leak.
o Never mix battery types. Always install new batteries of the same type.

Specifications

	Range and Resolution	Accuracy
Humidity	0.0 to 100.0% RH	±3% RH (10 to 90%) @ 23°C
Temperature (internal)	-20 to 50°C (-4.0 to 122.0^{o}F)	±1°C (±1.8^{o}F)
Temperature (external)	-20 to 70°C (-4.0 to 158.0^{o}F)	±1°C (±1.8^{o}F)

Display	Triple LCD
Sensor Type	Humidity: Precision capacitance sensor
	Temperature: Thermistor
Response Time	60 seconds typical
Dew Point	-90.4 to 122.0^{o}F (-68 to 50°C) (calculated from RH and Air temperature measurements)
Wet Bulb	-6.88 to 122.0^{o}F (-21.6 to 50°C) (calculated from RH and Air temperature measurements)
Operating Conditions	-20 to 50°C (-4 to 122°F); < 99% RH non-condensing
Storage Conditions	-40 to 85°C (-40 to 185°F); <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 x 1.9 x 1"); 140g (4.9 oz.)