

TRACEABLE® HUMIDITY/TEMPERATURE DEW POINT METER INSTRUCTIONS

| MODEL | | Universal Model 4080 | Basic Model 4083 | Fast Response 4085 |
|----------------|---------------|---|-------------------------------------|---|
| Humidity | Range | 10.0 to 95.0% | 10.0 to 95.0% | 5.0 to 95.0% |
| | Accuracy | ± 1.5% | ± 1.5% | ± 1.5% |
| | Resolution | 0.01 on all readings below 100, 0.1 on all readings above 100 | 0.1 | 0.01 on all readings below 100, 0.1 on all readings above 100 |
| | Response Time | 30 sec to 3½ min | 30 sec to 3½ min | approx. 10 sec |
| Temperature | Range | -40.00 to 220.0°F (-40.00 to 104.4°C) | -40.0 to 220.0°F (-40.0 to 104.4°C) | -40.00 to 220.0°F (-40.00 to 104.4°C) |
| | Accuracy | ±0.4°C (0-40°C) otherwise 1°C | ±0.4°C (0-40°C) otherwise 1°C | ±0.4°C (0-40°C) otherwise 1°C |
| | Resolution | 0.01 on all readings below 100, 0.1 on all readings above 100 | 0.1 | 0.01 on all readings below 100, 0.1 on all readings above 100 |
| Dew Point | Range | -40.00 to 140.0°F (-40.00 to 60.00°C) | -40.0 to 140.0°F (-40.0 to 60.0°C) | -40.00 to 140.0°F (-40.00 to 60.00°C) |
| | Resolution | 0.01 on all readings below 100, 0.1 on all readings above 100 | 0.1 | 0.01 on all readings below 100, 0.1 on all readings above 100 |
| Probe Diameter | | 0.7" (1.8 cm), | 0.7" (1.8 cm) | 0.4" (1 cm) |

Display: 3/8" four-digit LCD featuring RH, °F, °C, DP, MEM, ALM, and BAT indicators

Size, weight: 5¼ x 3-9/16 x 15/16", 12 oz (14.6 x 9 x 3.3 cm, 340 grams)

Sensors: Humidity: precision, thin-film capacitance
Temperature: Thermistor

Power: Replaceable 9-volt battery supplied low battery indicator on display

Case: High-impact, chemical-resistant ABS plastic

Controls: ON/OFF, HOLD/SCROLL, DISPLAY/MEM/ALM, CLEAR MEM/ALARM OFF/SET

Certification: Traceable® to National Institute of Standards and Technology (NIST) from our A2LA accredited calibration lab

Accessories available: Adaptor, NiCad battery, data cable, parallel-to-serial converter,

QUICK REFERENCE

ON/OFF button turns unit on and off.

HOLD/SCROLL button alternates between the Auto Scroll mode and the Hold mode. When the unit is initially turned on it will be in the Auto Scroll mode. It displays a reading, pauses, then scrolls to the next measurement. Press HOLD button to stop the scrolling and the display will read only the present measurement.

DISPLAY/MEM/ALM button switches between viewing current readings, high/low memory recordings, and high/low alarm set points for relative humidity (RH), temperature (°F, °C), and dew point (DP °F, DP °C).

CLEAR MEM/ALM OFF/SET button permits clearing the memory settings, turning off a sounding alarm, and setting an alarm.

RH, TEMPERATURE, AND DEW POINT MEASUREMENT

1. Turn unit on by pressing the ON/OFF button.
2. Unit automatically begins scrolling through measurements for relative humidity, temperature, and dew point. Indicators (RH; °F, °C; DP °F, DP °C) appear on the display to denote the current measurement.
3. Freeze the display at the desired measurement by pressing the HOLD button. Display "freezes" at the desired measurement while the unit continues sampling.
4. Place probe near the substance to be measured and read display.
5. Return to Auto Scroll mode by pressing the SCROLL button.
6. Press ON/OFF button to turn unit off. This resets all stored memories and alarms.

MEMORY RECALL OPERATION

Unit's memory function permits viewing the highest and lowest readings stored in memory for relative humidity, temperature, and dew point. "HI" appears on the display indicating highest reading stored, and "LO" appears on the display indicating lowest reading stored. All measurements (relative humidity, temperature, and dew point) are constantly scanned. If a new high or low reading is achieved while in the Display, Memory, or Alarm modes, the reading is automatically captured and is available for display.

Displaying highest/lowest memory readings

1. Press MEM button until the word "MEM" appears in the lower, right-hand corner of the display. Unit is now in Memory mode.
2. If the unit is in Auto Scroll mode when the Memory mode is activated, the display will scroll through the highest and lowest readings recorded for relative humidity (RH), temperature (°F, °C), and dew point (DP °F, DP °C).
3. If the unit is in Hold mode when the Memory mode is activated, the highest reading recorded for that specific measurement will be displayed. Press the SCROLL button to return to the Auto Scroll mode and then press the HOLD button at any time to "freeze" the display at a particular measurement.

Clearing memory readings

1. Verify the unit is in Memory mode by checking to see if the word "MEM" appears on the display. If the unit is not in Memory mode, press the MEM button until "MEM" appears on the display.
- Note:** Memories may only be cleared while the unit is in Memory mode and "MEM" appears on the display.
2. While the unit is in Memory mode, press the CLEAR MEM button to reset all of the memory settings. Memory settings will automatically reset to the current readings for relative humidity, temperature, and dew point.
3. Exit the Memory mode and return to normal Display mode by pressing the MEM button twice.

ALARM OPERATION

High and low alarm set points may be entered in any 0.1 increment for relative humidity, temperature, and dew point measurements. When an alarm set point is tripped, an audible alarm sounds constantly for 1 minute, unless turned off manually, and then sounds once every minute to conserve battery life. After the first minute, a visual alarm appears on the display as a flashing "ALM". The alarm will sound if an out-of-range condition exists irrespective of the measurement being displayed.

Setting an alarm

1. Press the ALM button until "ALM" appears on the display to indicate the unit is in Alarm mode.
2. If the unit is in Auto Scroll mode when the Alarm mode is activated, the display will scroll through the high ("HI") and low ("LO") alarm settings for relative humidity, temperature, and dew point.
3. If the unit is in Hold mode when the Alarm mode is activated, the high alarm setting for that specific measurement will be displayed. Press the SCROLL button to return to the Auto Scroll mode and then press the HOLD button at any time to "freeze" the display at a particular alarm setting.
4. Once the desired unit of measurement appears on the display, press the HOLD button to "freeze" the display if necessary.
5. Press the SET button to advance the display in increments of 0.1. For rapid advancement, press and hold the SET button.
6. Once the desired alarm set point has been entered, exit the Alarm mode by pressing the ALM button and return to normal Display mode. Alarm is now activated and will sound if an out-of-range condition occurs.

Note: When setting an alarm in degrees Celsius, the units advance unevenly because the units are being advanced internally in the Celsius equivalent of 0.1° Fahrenheit. Alarm set points may be entered in °F or °C but they must be equivalent.

Note: Very rapid changes in humidity and temperature may cause the dew point alarm to sound a false alarm. A "phantom" sensed out-of-range dew point alarm may be triggered by either the humidity sensor or temperature sensor sensing a change faster than the other. (Example: instantly taking the probe from a 70°F, 80% RH environment to a 20°F, 5% RH environment may trigger a false alarm.) This may be eliminated by lowering the alarm set point for dew point or by turning the unit off and, after the probe reaches an equilibrium, turning it back on.

Silencing an active alarm

Once an alarm set point is triggered, the alarm will continue to sound and flash until turned off (even if the measurement value returns to an in-range condition). Silence an active alarm by pressing the ALM OFF button in any measurement or any mode. The alarm will NOT trip again until the current value passes through the alarm set point and again is within a normal (non-alarm) range.

Example: If the RH "HI" alarm is set at 80.10 and the current reading is 80.20, the alarm will sound. After the ALM OFF button is pressed, the alarm will be silenced and will not be triggered again until the RH falls below 80.10 (resetting the alarm) and then rises above the set point to 80.20 (triggering the alarm).

To determine which setting caused an out-of-range alarm, display the memory's high and low values and search for a value that is beyond the alarm set point.

Default alarm settings

When the unit is turned on, the alarms automatically default to out-of-range set points so that the alarms will not trigger. The default settings are:

| | | | | |
|-------------------|----|--------|----|--------|
| Relative Humidity | HI | 101.00 | LO | -01.00 |
| Temperature °F | HI | 221.00 | LO | 0.00 |
| Temperature °C | HI | 105.00 | LO | -17.77 |
| Dew Point °F | HI | 141.00 | LO | 0.00 |
| Dew Point °C | HI | 60.56 | LO | -17.77 |

To prevent any alarm from tripping, simply set the alarm set point out of the unit's range. As an example, in relative humidity any alarm set point above 100 or less than zero will never trip the alarm. To quickly reset all alarm values to the default out-of-range condition, simply turn the unit off, wait 2 seconds, and then turn it on again.

Default alarm sounds

Three distinctive alarm sounds distinguish each measurement. The alarm sounds are:

| | |
|-------------------|--------------------|
| Dew Point | 1 beep per second |
| Temperature | 2 beeps per second |
| Relative Humidity | 3 beeps per second |

Note: If two or more alarms are sounding simultaneously the sound will be heard in the following sequence: dew point, temperature, and relative humidity.

GENERAL INFORMATION

Display

For ease of use the display is optimized at a 20-degree angle. It is best viewed by the user when sitting or standing with the unit flat on a lab bench or desk. When viewed straight-on the display will appear to have less contrast.

Key sound

An audible confirmation beep will be heard each time a button is pressed.

Freezing points

Dew points below freezing should be converted to frost points by using frost point tables.

USER CALIBRATION

WARNING: User calibration adjustment will void the factory-supplied National Institute of Standards and Technology (NIST) Traceable® Certificate. The unit has been calibrated against NIST traceable instrumentation.

For users wishing to check factory calibration, we suggest using a calibration laboratory with capabilities to generate a known humidity and utilize sophisticated chilled mirror test equipment.

Salt as a calibration standard

We do NOT recommend or use the saturated salt calibration method. NIST does NOT use the salt method. The proper technique involved in the salt method is far more difficult and far more time consuming than most literature suggests. Liquid volume, air volume, sensor placement, temperature, air movement, vapor pressure, equilibration time, and a host of other factors can all contribute to gross errors. On occasion these errors are reproducible.

For information on the saturated salt method we suggest studying American Society of Testing Materials Method ASTM E104 and obtaining a paper from the National Institute of Standards and Technology JOURNAL OF RESEARCH, Vol. 81A, No. 1, pages 89-96.

Dial hygrometers as a calibration standard

Absolutely do NOT calibrate against hair dial hygrometers. Inaccuracies in dial units caused by age of hair and other factors can greatly affect readings. Dial units are not sensitive to rapid changes and readings generally lag actual humidity changes by hours. Users of some dial units have encountered errors of over 50% relative humidity.

Sling hygrometer calibration

Absolutely do NOT calibrate against sling units. Sling units are limited to the accuracy and resolution of their thermometers. Temperature errors of as little as 0.05° can cause significant humidity errors. Unfortunately temperature, time, air volume, and technique can cause reproducible, but large errors. In low humidities, in small spaces, the addition of a wet wick may change the actual humidity. If too much swing time is taken, a partially dry wick produces errors. If too little swing time is taken, sufficient evaporation may not have taken place to cool the thermometer. Sling units generally measure crude averages of a large volume of air. Users of some sling units have encountered errors of over 50% relative humidity.

ACCESSORIES AVAILABLE

Cat. No. 1023 AC Adaptor for continuous use

An accessory adaptor is available for continuous AC operation. When using the adaptor, the non-rechargeable lithium or alkaline battery must be removed. Never use the adaptor with a non-rechargeable battery. A battery is NOT required to use the adaptor. A rechargeable NiCad battery may be used with the adaptor. The adaptor will simultaneously power the unit and recharge a NiCad battery.

Cat. No. 4020 Rechargeable NiCad Battery

Requires use of Cat. No. 1023 AC Adaptor for continuous use.

Cat. No. 4099 Data Acquisition System Accessory

Powerful and easy to use computer data capture/data logging program works with Traceable® Instruments with computer output. Records interval readings from 1 to 10,000 seconds; displays minimum/maximum readings; and utilizes an alarm mode that permits the user to be notified visually, audibly, and by email when an alarm is triggered. Data is stored to a file that can be printed in any report or spreadsheet format. Networking server/client capability allows the captured data to be monitored on a remote workstation and/or by email. It is designed to work with Windows® 98/Me/NT/2000/XP/Vista. Includes a CD, a 6-foot cable (supplied USB and serial connections) that plugs into the instrument and computer. Accessory extension cables expand cable length to 300 feet.

ALL OPERATIONAL DIFFICULTIES

If this meter does not function properly for any reason, please replace the battery with a new high quality battery (see "Battery Replacement" section). Low battery power can occasionally cause any number of "apparent" operational difficulties. Replacing the battery with a new fresh battery will solve most difficulties.

Frozen display

Turning the unit on and off rapidly may lock (freeze) the display. Wait 2 seconds before switching the unit from off to on. If a "frozen display" occurs, remove the battery, wait 1 minute, insert the battery, and resume operation.

BATTERY REPLACEMENT

A faint display or no display are indicators that the battery must be replaced. A BAT indicator appears on the display when the battery is low. Remove the battery cover on back of the unit. Remove the exhausted battery and replace it with a new 9-volt alkaline or lithium battery. Replace the battery cover. Do NOT use a heavy-duty or regular battery since they do not have sufficient power. If BAT indicator appears on the display when using a NiCad battery, recharge the battery.

| | |
|---------------|---|
| Cat. No. 4080 | Traceable® Humidity/Temperature/Dew Point Meter (Universal) |
| Cat. No. 4083 | Traceable® Humidity/Temperature/Dew Point Meter (Basic) |
| Cat. No. 4085 | Traceable® Humidity/Temperature/Dew Point Meter (Fast-Response) |

WARRANTY, SERVICE, OR RECALIBRATION

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Control Company is ISO 9001 Quality-Certified by DNV and ISO 17025 accredited as a Calibration Laboratory by A2LA.