



## Model 485-1 Digital Hygrometer

### Instructions and Operation



#### Specifications

##### Relative Humidity Measurement

Range: 0-100%  
 Accuracy:  $\pm 2\%$   
 Resolution: 0.1%  
 Sensor Operating Temperature Limits:  
 $-22$  to  $185^{\circ}\text{F}$  ( $-30$  to  $85^{\circ}\text{C}$ )

##### Temperature Measurement

Range:  $-22$  to  $185^{\circ}\text{F}$  ( $-30$  to  $85^{\circ}\text{C}$ )  
 Accuracy:  $\pm 1^{\circ}\text{F}$  ( $\pm 0.5^{\circ}\text{C}$ )  
 Resolution:  $0.1^{\circ}$

##### Ambient Temperature Operating Range

$32$  to  $104^{\circ}\text{F}$  ( $0$ - $40^{\circ}\text{C}$ )

##### Storage Temperature Limits

$-40$  to  $176^{\circ}\text{F}$  ( $-40$  to  $80^{\circ}\text{C}$ )

##### Power Source

9 volt alkaline battery

The Model 485 Digital Hygrometer is a versatile hand-held, battery operated instrument for measuring both percent relative humidity and temperature in either  $^{\circ}\text{F}$  or  $^{\circ}\text{C}$ . The unit uses a rugged precision polymer film humidity sensor that will provide years of maintenance-free service. The unit will also calculate the dew point temperature and wet bulb temperature based on the relative humidity and temperature readings. Minimum and maximum readings for temperature and relative humidity can be saved for later reference. Reading can be frozen with the Hold function. A memory function allows up to 25 samples to be stored in non-volatile memory.

#### Battery Installation

The unit is shipped with a separate 9 volt alkaline battery which must be installed before operation. Remove the two screws holding the bottom endcap in place and remove it. Connect the battery to the enclosed battery clip observing correct polarity. Be careful not to trap wires between the battery, case or foam pads which retain the battery. This could make it difficult to install the battery or remove it later for replacement. Be sure the rubber gasket is properly seated in the gasket channel and replace endcap. Note that the endcap will only fit one way because holes are slightly off-center. Place the "Z" shaped wrist strap clip in one of the screw recesses and replace the screws. Do not overtighten. Attach wrist strap to clip.

When battery replacement becomes necessary, use only a 9 volt alkaline type such as a Duracell<sup>®</sup> MN1604, Eveready<sup>®</sup> 522 or equivalent. Zinc-carbon types, often labeled Heavy-Duty are not recommended because of the increased potential for leakage. Alkaline batteries are also a better value because they last up to three times longer in this device.

## **On-Off Operation**

The on-off control is a toggle function. Press the ON/OFF key once to turn unit on; again to turn it off. If the instrument is left on with no activity for approximately 2½ minutes the unit will turn itself off to conserve the battery. Each time any key is pressed the time-out will be reset to 2½ minutes.

An extended time-out function is provided if the 2½ minute period is not long enough. With the unit off, press the ON/OFF key and the DP/WB/STORE keys simultaneously during power on and release them together. The ALARM 2 annunciator will be lighted. The power time-out will now be approximately 23 minutes. This function is also useful for minimum/maximum sampling. Turn the unit on in the extended time-out mode, then clear the MIN/MAX memory and place the unit in the selected test location. It will record the minimum and maximum temperature and humidity monitored during the sample period.

## **Display Backlight**

The model 485 includes a display backlight to allow use under inadequate lighting conditions. The unit must be off before this feature can be actuated. Press and hold the ON/OFF key. After about 1 second the backlight will switch on and remain lighted for about 2 minutes after which it will switch itself off to conserve battery life.

## **Selecting Temperature Units**

Temperature readings can be displayed in either °F or °C. Currently selected units will be indicated in the display. To change the units, press the UNITS/LOC key. The units selected will remain in memory even when power is shut off. This assures your preference will be used each time after the initial selection.

## **Display Hold**

The Model 485 includes a display hold function which freezes the current reading and holds it until manually cleared. To activate this function, momentarily press the HOLD/MEMORY key when you see the reading you want to save. A HOLD indicator will appear in the display window to indicate that the reading shown is frozen. To return to normal operation, press the HOLD/MEMORY key again. The HOLD indicator will disappear and current temperature and humidity values will be shown and continuously updated.

## **Dew Point and Wet Bulb Temperatures**

The Model 485 can automatically calculate dew point and wet bulb temperatures. To display the dew point temperature, press the DP/WB/STORE key. The large display will show the dew point temperature in the units selected. The smaller %RH indicator will change to read dP for dew point. To display the wet bulb temperature, press the DP/WB/STORE key again. The lower left display will now indicate bt for wet bulb temperature. To restore unit to indicate %RH, press the DP/WB/STORE key again. The %RH indicator will reappear and humidity and ambient temperature will again be displayed.

## **Min-Max Readings**

A minimum and maximum reading function is included with the Model 485. It stores minimum and maximum temperature and relative humidity readings until manually cleared. To read minimum values, press and hold the MIN key. To read maximum values, press and hold the MAX key. Releasing either key returns the unit to continuous readings. To clear MIN/MAX memory press both keys simultaneously. The display will indicate "----" when the operation is complete. After clearing, the unit begins storing new minimum and maximum readings starting with current values. Minimum and maximum readings are stored in non-volatile memory so they remain even when power is off.

## **Memory Function**

A memory function is included which allows you to store up to 25 humidity and temperature readings. They are stored in non-volatile memory so they are retained even when power is off.

### **Entering Memory Mode**

To enter memory mode, press and hold the HOLD/MEMORY key until the MEM indicator appears in the display. The key can then be released. The active memory location will be briefly displayed starting with "01", then humidity will be displayed.

### **Storing Readings**

To store a reading in memory, press the DP/WB/STORE key. The reading will be stored in the previously indicated memory location and a beep will sound to indicate the reading has been saved. As each reading is saved, the memory index advances with its number appearing briefly in the lower left corner of the display window.

### **Viewing Stored Readings**

To view the contents of memory the unit must be in the memory mode. To enter the view mode, press the UNITS/LOC key. The HOLD indicator will appear with the MEM indicator to indicate that memory values are being shown instead of the current values and the location number will briefly appear. Each time the UNITS/LOC key is pressed, the memory location is advanced with the new location number briefly displayed. If the key is held down, the memory location will automatically be advanced, scrolling through all stored readings. Release key to stop. This operation can also be used to select a specific location to store the next reading. To resume normal temperature and humidity measurements, press the HOLD/MEMORY key. The HOLD indicator will disappear and the display will resume showing current values. The last memory location viewed will remain as the location where the next sample will be stored.

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## **Clearing Memory**

To clear the memory of all previously stored values, press and hold the DP/WB/STORE key and simultaneously press the ON/OFF key. During the clearing operation "----" will be displayed. When the memory is cleared, the current readings will be displayed and the memory location will be set to "01".

## **Exiting Memory Mode**

To exit memory mode, press the HOLD/MEMORY key. The memory indicator will disappear. All values stored in memory will be stored for later viewing.

## **Low Battery Indicator**

A weak battery can cause improper operation or inaccurate readings. A low battery indicator is included in the display to warn when battery needs to be replaced. Although the unit might appear to function and read properly, accuracy of readings cannot be guaranteed when the "LOW BAT" indicator appears. Replace it with a fresh alkaline one promptly. Do not leave an exhausted battery in the unit due to the risk of damage from leakage.

## **Light Sensitivity**

The sensor used in the Model 485 may be affected by very high ambient light levels and will read zero percent humidity under such conditions. The protective housing on top of the unit is sufficient to prevent this in most situations but when operating outdoors in direct sunlight, it might be necessary to shield the unit when taking readings. Ambient light does not affect the accuracy of the instrument.

## **Maintenance**

No routine maintenance is necessary and unit is not field repairable. Return the instrument to the factory if service is needed. Please include a complete description of the problem plus any available application information.