

PosiTector DPM

Dew Point Meter

INSTRUCTION MANUAL v. 2.0



Simple. Durable. Accurate.

Introduction

The **Dew Point Meter** is a hand-held, electronic instrument that measures, calculates and records climatic parameters, quickly and accurately.

Measured parameters are:

%RH	39.9
T _a	24.6
T _s	24.4
T _d	10.1
△	14.3

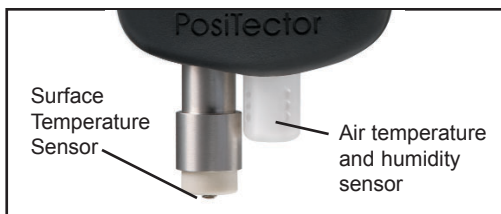
RH - Relative Humidity

T_a - Air Temperature

T_s - Surface Temperature

T_d - Dew Point Temperature

△ - Surface *minus* Dew Point
Temperature



Power-up / Power-down

The **PosiTector DPM** powers-up when any button is pressed. To preserve battery life, the instrument powers-down after approximately 3 minutes of no button activity. To power-down immediately, hold both (-)(+) buttons for 5 seconds. Settings are retained during power-down.

Operation Overview

Upon power-up, the following 5 parameters are displayed and updated automatically each second.

RH - The relative humidity sensor is located inside the white plastic housing. The sensor may require a longer period to stabilize in the event of extreme humidity changes.

Ta - The air temperature sensor is also located inside the white plastic housing.

Ts - A surface temperature thermocouple is located on the tip of the silver probe. It is spring loaded and designed to quickly self-align on a surface. Press it against a surface and allow a few seconds for the value to stabilize. Do not drag the sensor over the surface. Wet the surface for a faster response.

NOTE: For surface temperature measurement over a long period of time, consider using the optional Magnetic Surface Temperature kit (pg. 11).

Td - The dew point temperature is a function of air temperature and relative humidity (see ISO 8502-4 Annex A). It is the temperature to which a volume of air must be cooled in order to reach saturation.

△ - The delta value is the surface minus dew point temperature (**Ts** - **Td**). This value is important in judging the risk of condensation, or dew, forming on a surface. For example, ISO 8502-4 recommends that, unless otherwise agreed, the temperature of a steel surface generally should be at least 3°C (5°F) above the dew point when paints are applied.

NOTE: The instrument may require a period of time before the above climatic parameters stabilize. This is most noticeable when the instrument is relocated from one extreme environment to another (i.e. from a warm location to a cold location). A period of up to 30 minutes should provide adequate time for stabilization.

Smart Trend™ Indicators ↑↓ - identify rising, falling or stable readings. The instrument compares each measurement with the average of recent values in an attempt to provide the current direction of change.


%RH	46.8	
Ta	27.3	
Ts	29.1	↓
Td	14.9	
△	14.2	↓



Smart Trend Indicators

While the absence of an arrow does not necessarily signify stability, it can be taken to mean that particular parameter is undergoing little or no change. Slow changes in a parameter could therefore occur without being noted by an indicator arrow. When instructed to manually store a dataset into memory (pg. 6), the instrument will wait for these Smart Trend Indicators to disappear before recording all values to memory.


Button Shortcuts:

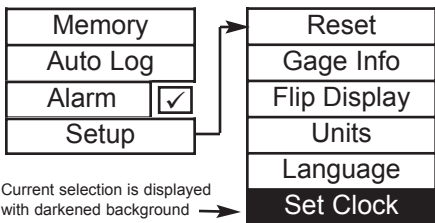
(-) Button: causes the display to rotate 180°. Ideal for right-side-up viewing when sensors are pointing away from you. Press (-) again to restore display position.


(+) Button: freezes the display. The instrument will measure one more time, then hold all values and display the hold icon . Press (+) again to unfreeze the display. This feature does not work while in Memory Mode.


 **Button:** accesses the instrument menu (pg. 5). Within the menu, the  button is used to select an option.

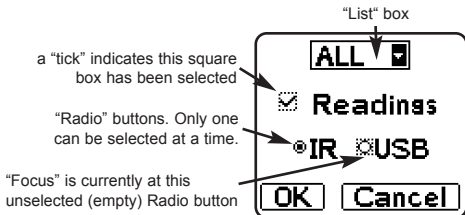
Menu Operation

Instrument functions are menu controlled. To access the Menu, turn the instrument on, then press the  button.



To navigate, press (-) to scroll DOWN, (+) to scroll UP and  to **SELECT**. Press both (-)(+) buttons at any time to exit any menu or select **Exit** from the Menu.

List boxes have a down arrow on the right-hand side. Use the (-) and (+) buttons until your desired choice appears, then press  to select this choice and move focus onto the next item.




Memory Management

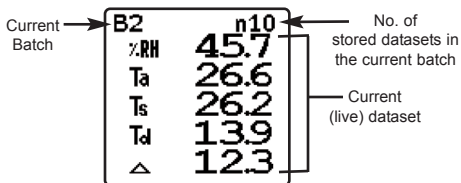
Memory

The **PosiTector DPM** can record 2,500 datasets in up to 100 groups (batches) for on-screen analysis, for printing to an optional IR printer, or for downloading to a personal computer using optional **PosiSoft** software and USB cable.

NOTE: A *dataset* contains 6 values: RH, Ta, Ts, Td, Δ Delta and the date/time when they were recorded.

New Batch

-closes any currently opened batch and creates a new batch name using the next higher number. For example, if only **Batch 1** and **Batch 3** exist, then **Batch 4** would be created and made the current batch. Memory is activated and the  icon appears. New batches are date stamped when they are created.



Current Batch	B2	n10
	%RH	45.7
	Ta	26.6
	Ts	26.2
	Td	13.9
	Δ	12.3

Storing a dataset into memory manually

Place the surface temperature sensor on the surface. Press (+) to store the current dataset into memory. If the Smart Trend Indicators indicate one or more values are changing, the instrument will beep and blink once every second until the dataset values stabilize. When the dataset values have stabilized, the LED will blink twice and the instrument will emit a double beep. Dataset values are now stored in memory along with the current time.

Open

-selects a previously created batch name to open and make current. The current batch name and number of stored datasets will be displayed.

Close

-stops the recording process, closes the current batch, and removes batch information from the display.

Delete

-removes a batch completely from memory. The name is deleted and its datasets are erased.

View

-lists all datasets beginning with the current or most recently used batch.

First to appear is a graph of individual data points as shown in *Figure 1*. Scroll through each dataset parameter using the (-).

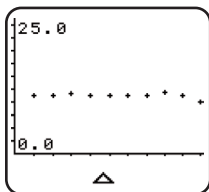



Figure 1

Press  or (+) button to view batch statistics and individual datasets (see *Figure 2*).

Scroll datasets using the (-) or (+) buttons. Hold for 1 second to scroll a page at a time.

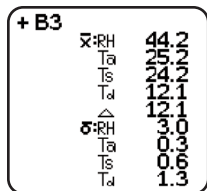


Figure 2

\bar{x} - Average

σ - Standard Deviation

\downarrow - Minimum value

\uparrow - Maximum value

To return to graph view or to exit press .

Shortcut: To exit press (-)(+) buttons simultaneously.

Print

-prints stored datasets and/or summary to the optional IR printer or to a PC's default Windows printer via the optional USB cable and PosiSoft software. Press **(-)(+)** simultaneously to cancel printing.


Downloading Measurements Stored in Memory

Datasets stored in the instrument's memory (in batches) can be downloaded to a computer using optional PosiSoft software and USB cable (pg. 12). Datasets are not erased from memory after downloading.

Auto Log

Automatically displays and records datasets at user selected time intervals for unattended operation.

When selected, the Log Interval menu will appear on the display as shown.

Navigate using the **(-)** **(+)** buttons. Press  to select the element in focus, then select **OK**.


Log Interval

- 1 min
- 5 min
- 10min
- 15min
- 30min
- 60min

OK

Cancel

The instrument will display the Auto Log symbol


 and will begin recording. An audible tick sound will emit from the instrument every few seconds to indicate recording is in progress. At each interval, the displayed values update, the LED flashes and the dataset is stored into memory.

Recording will continue until memory is full, the instrument loses power, or the user turns off Auto Log.

B1 n34
%RH 41.5
Ta 25.5
Ts 25.8
Td 11.5
△ 14.3
 °C

NOTE: To conserve battery life, displayed values only update at the Log Interval. The last recorded values will remain “frozen” on the display until the next interval values have been stored.

Recorded datasets are stored into the currently opened batch. If no batch is open, a new batch will be created. Datasets are recorded regardless of the state of the Smart Trend Indicators (see pg. 4).

To turn off Auto Log, press the  button and hold until the next tick sound. A final dataset will be stored in memory and the current batch will remain open.

Recorded datasets can be viewed on the LCD, viewed graphically for quick trend analysis on-site (see pg. 7) or downloaded to a printer or PC. Downloading to a PC requires optional PosiSoft Software (pg. 12).

NOTES:

-It is recommended that fresh alkaline batteries be installed prior to an extended Auto Log.

-Auto Log works best with optional Magnetic Surface Temperature kit (see pg. 11)

-If memory becomes full, or the instrument loses power and shuts off, all previously stored readings will remain in memory.

Alarm

When tick box is checked, the instrument will alert the user when the surface temperature is less than 3°C (5°F) above the dew point temperature (Δ value). According to ISO 8502-

4 and ASTM D3276, steel surfaces should generally be 3°C (5°F) above the dew point when painting. The instrument will alert the user with an audio tone and the LCD screen will reverse (see above) when conditions may be unsuitable for painting.

%RH	91.2
T _a	26.6
T _s	27.2
T _d	25.0
Δ	2.2


Setup Menu

Setup

Reset

Reset restores factory settings and returns the instrument to a known, out-of-the-box condition. It is handy when you want to “start all over”. The following occurs:

- all batches are closed and stored datasets are erased.
- menu settings are returned to the following:
Memory = OFF Alarm = ON

A more thorough **Reset** can be performed by holding the (+) button when the instrument is powered down until the Reset symbol  appears. It performs the same function as a menu Reset with addition of **Units = °C**, and **Language = English**.

NOTE: Date and Time are not affected by any **Reset**.

Units

This menu button converts the display and all stored datasets from Celsius to Fahrenheit or vice versa.

Set Clock

All batches are *date*-stamped when created, and all datasets are *time*-stamped (24 hour format) when stored into these batches. It is therefore important to keep both the date and time current using this menu button. Alternatively, the date and time can be updated when the instrument is connected to the optional **PosiSoft** software (pg. 12).

Flip Display

This option causes the display to rotate 180°. Ideal for right-side-up viewing in any position.

Shortcut: The (-) button flips the display.

Available Options

Magnetic Surface Temperature Kit

Allows the instrument and surface temperature probe to be conveniently attached onto steel structures for hands-free recording. Ideal for unattended data logging during the work shift and overnight.



*Interchangeable
lower unit
(push to disconnect)*

*Magnetic surface
temperature
probe*

Kit Includes:

- Interchangeable lower unit with built-in air temperature/humidity sensor and a K-type connector that accepts the magnetic surface temperature probe.
- Magnetic surface temperature probe with armored cable and locking device to prevent accidental disconnection from the instrument during unattended operation.
- Additional rubber holster with magnetic clip to attach the instrument body onto steel structures.
- PosiSoft Software and USB cable
- Durable, hard shell carrying case
- Certificate of Calibration

This lower unit accepts other optional K-type thermocouple probes including:

Hand-held Surface Temperature Probe

-for spot checking hard-to-reach surfaces

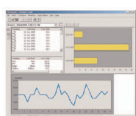
Self-adhering Surface Temperature Probe

-sticks to solid materials including aluminum, wood, concrete, etc. Ideal for unattended monitoring.

Liquid Temperature Probe

-general purpose probe with stainless steel shaft

PosiSoft® for Windows® analysis software



Downloads stored datasets to a PC with included USB cable. Allows entry of notes and annotations, prints histograms and basic charts, manages data, and datasets can be exported to a document or spreadsheet.

PosiSoft also allows climatic values to be transferred live to an FTP (File Transfer Protocol) site. Ideal for viewing climatic conditions from a remote location.



AC Power Cable

Provides continuous operation. Ideal for extended Auto Log use.



Portable IR Printer

Receives data via wireless invisible infrared beam. Battery operated. Ideal for use in the field or shop floor.

Troubleshooting

When the surface temperature probe is not on a surface, Air Temperature and Surface Temperature appear to be different:

Under normal conditions with the surface probe in air T_a and T_s should be within the combined tolerance of each sensor (typically 1°C). It is possible for the difference to be larger if the surface probe has recently been in contact with surfaces that are at a different temperature than air.

RH value is slow to stabilize:

If the probe is exposed to a very low humidity for an extended time period and then placed in a high humidity environment the displayed Relative Humidity (RH) may appear to respond slowly. Allow the probe to stabilize 30 minutes for a change of RH greater than 50%. It may take longer if the probe was left at low RH for several months. To increase response time soak the sensor in a damp face cloth overnight to recondition the RH sensor.



Surface Temperature reads much higher than expected:

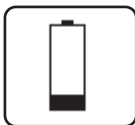
The probe tip may be dirty or damaged. Clean the probe tip by soaking in water or solvent. If T_s continues to read high then return the probe for service.

Surface temperature value does not agree with expected surface temperature or surface temperature probe is slow to respond:

In some cases the surface being measured is very rough and a good thermal connection from the probe tip to the surface is not possible. If possible place a small drop of water on the surface and then place the probe tip into the water drop. Extremely quick and accurate results can be obtained in this manner.

Changing The Batteries

The battery icon  displays four bars with fresh alkaline batteries installed. As the batteries weaken, the number of bars will be reduced. When the batteries become very weak  the Power Warning image will display and the instrument will automatically power-down. To maintain user settings and stored measurements, the batteries must be replaced. USE ONLY "AAA" ALKALINE BATTERIES



Power Warning



This image appears if the memory of the instrument has become corrupt. This can occur in the event that the batteries were removed while the instrument was powered-on and was not able to self power-down. If this message appears it will be followed by a full reset. All readings in memory will be erased and instrument settings will be reset to "out-of-the-box" settings.

NOTES:

To retain all user settings and stored memory readings, only replace the batteries after the instrument has automatically powered-down.

-Nickel-cadmium and nickel-metal hydride rechargeable batteries will work but the instrument may appear to have weak batteries.

Returning for Service

Before returning the instrument for service...

1. Install new Alkaline batteries in the proper alignment as shown within battery compartment.
2. Examine the surface temperature probe tip for dirt or damage.
3. Perform a **Reset** (pg. 10)

If you must return the instrument for service, describe the problem fully and include measurement results, if any. _____

Technical Data

Conforms to: ISO 8502-4, BS7079-B and ASTM D3276

	Range	Accuracy	Resolution
Surface Temperature	-40° to 80° C	±0.5° C	0.1° C
	80° to 190° C	±1.5° C	0.1° C
	-40° to 175° F	±1° F	0.1° F
	175° to 375° F	±3° F	0.1° F
Air Temperature	-40° to 80° C	±0.5° C	0.1° C
	-40° to 175° F	±1° F	0.1° F
Humidity	0 to 100%	±3 %	0.1 %
Operating Range	-40° C to +80° C -40° F to +175° F		

Instrument body: Dimensions: 178 x 64 x 31 mm (7" x 2.5" x 1.2")

Weight: 185g (6.5 oz) without batteries

Battery Life: 100 hours continuous; 80 hours Auto Log

Certification

All **PosiTector DPM** instruments ship with a Certificate of Calibration. For organizations with re-certification requirements, instruments may be returned at regular intervals for calibration. DeFelsko recommends that customers establish calibration intervals based upon their own experience and work environment. Based on our product knowledge, data and customer feedback, a one year calibration interval from either the date of calibration, date of purchase, or date of receipt is a typical starting point.

Limited Warranty, Sole Remedy and Limited Liability

DeFelsko's sole warranty, remedy, and liability are the express limited warranty, remedy, and limited liability that are set forth on its website:

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