

HYGROPALM23



SHORT INSTRUCTION MANUAL

Portable humidity and temperature instrument

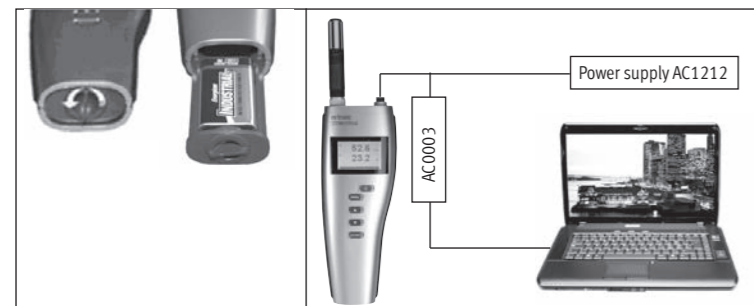
General description

The HP23 is a multifunction hand-held indicator with data logging capability. The HP23 can be used in many different applications such as the spot check measurement of HVAC installations and manufacturing processes, the measurement of seeds, pharmaceutical powders and other materials in bulk, the measurement of paper stacks and rolls, etc. The HP23 is also a calibrator that can be used to read and adjust other instruments from ROTRONIC that are based on the AirChip 3000 technology. The detailed instruction manual can be found on the internet at: www.rotronic-humidity.com

Power supply

The HP23 uses either a standard 9V alkaline battery (factory default) or a 9V rechargeable Ni-MH battery (user configuration). The rechargeable battery is charged either by connecting the service connector to a USB port or by plugging a battery charger (part number AC1212) to the service connector.

Important: the HP23 is shipped with a regular 9V battery and is factory preset with the battery charge function turned off. If you plan on using a rechargeable battery, you should turn on the battery charge function (see Function Menu – Settings). Before using a regular battery again, be sure to turn off the battery charge function. Trying to charge a regular battery may cause the battery to burst and may damage the instrument. **To insert (replace) the battery, turn the latching button counter-clockwise and pull out the battery holder.**



Power consumption

With the default display refresh rate is 1 second the probes are permanently powered. To conserve battery power, the display refresh rate can be set from the HP23 keypad to one of the following: 10 sec, 1 min or 10 min. (MENU > Device Settings > DataUpdate). The autonomy of the HP23 with a fully charged battery depends on factors such as the display backlight, the number of probes, the display refresh rate, the functions being used, etc. As an indication, the typical current consumption is as follows: 6.5mA with 1 probe and 20mA with 1 probe + backlight.

WARNING: the display refresh rate setting can affect the data logging function of both the HP23 and probe.

Measured Parameters

HygroClip2 probe: Humidity and temperature. The HC2 probes measure relative humidity with a ROTRONIC Hygromer® IN1 capacitive sensor and temperature with a Pt100 RTD.

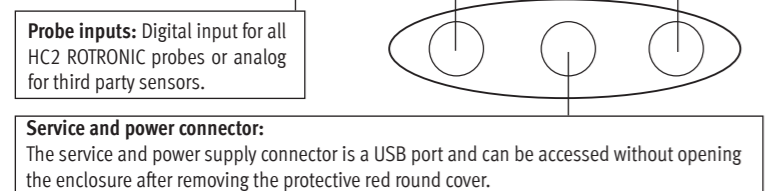
Analog probe (general): Any parameter measured by the probe. The parameter unit must be specified with the HW4 software (Device Manager).

Analog pressure probe: the unit used for barometric pressure is set with the HW4 software > Device Manager > Unit System.

Calculated Parameters

- Dew point (Dp) above and below freezing
- Frost point (Fp) below freezing and dew point above freezing
- Wet bulb temperature (Tw)
- Enthalpy (H)
- Vapor concentration (Dv)
- Specific humidity (Q)
- Mixing ratio by weight (R)
- Vapor concentration at saturation (Dvs)
- Vapor partial pressure (E)
- Vapor saturation pressure (Ew)

Connections



The HP23 has two probe inputs. Using the HW4 software (Device Manager), each probe input can be configured to accept one of the following:

HygroClip2 humidity-temperature digital probe:

Any input configured to accept a HygroClip2 digital probe can also be used to read and adjust an instrument or device that is based on the AirChip 3000 technology (use service cable AC2001).

1-channel analog probe (general):

To be compatible with the HP23 the analog probe must meet the following requirements: supply voltage: max. 5 VDC, current consumption: max. 10 mA, output signal: 0 to max. 3.3 VDC. The HP23 uses a 12-bit A/D converter to digitize the probe analog signal and can be configured to measure practically any parameter.

Analog pressure probe:

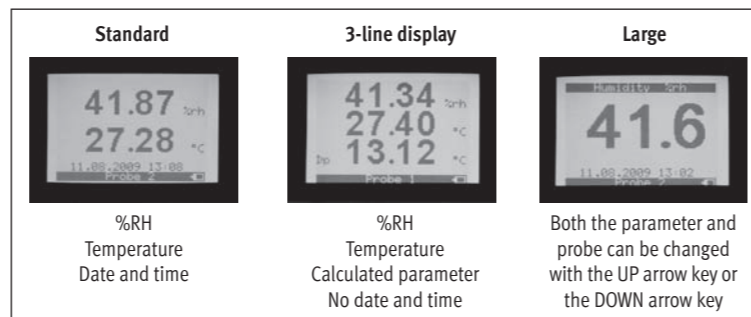
This is a special case of analog probe and is subject to the same compatibility requirements. When analog pressure probe is selected, the HP23 automatically uses the signal from the probe to calculate any humidity parameter that requires barometric pressure as an input value (example: mixing ratio).

Pin-Out Diagram

- RXD UART digital probe
- GND (digital and power)
- V+: digital probes: 3.3 VDC nominal, analog probes: max. 5.0 VDC, 10 mA
- AGND (analog ground)
- Not used
- One-channel analog probe signal: +0.0 to 3.3 VDC
- TXD UART digital probe

Display and display modes

The LC display has a backlight which can be set to be on all the time or whenever a key is pressed. The backlight can also be disabled. Using the HP23 Menu > Device Settings > Display Settings, the display mode can be changed as shown below:

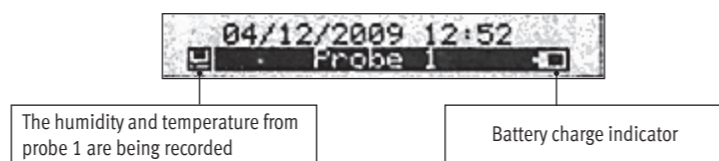


The display can also be configured to show a trend indicator on each line:

- ▲ increasing value
- ▼ decreasing value
- ◀ Constant value (End value is reached)

In the event of an alarm the symbol [!] appears to the right of the value.

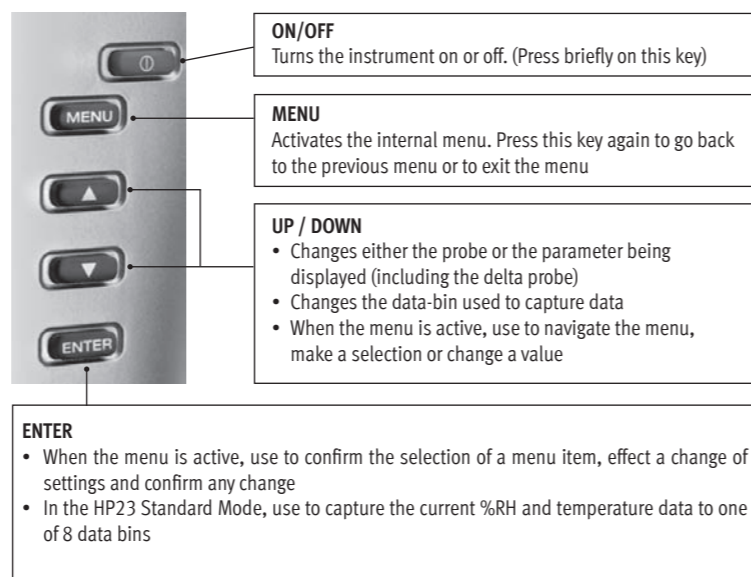
The bottom of the display shows the date and time as well as which probe is currently selected:



The humidity and temperature from probe 1 are being recorded

Battery charge indicator

Functions Key



Practical advice for measuring humidity

The most common source of error when measuring relative humidity is a difference between the temperature of the probe and the temperature of the environment. At a humidity condition of 50 %rh, a temperature difference of 1°C typically results in an error of 3 %rh on relative humidity. When using the HP23 hand-held indicator, it is good practice to monitor the display for temperature stability. The probe should be given sufficient time to equilibrate with the environment to be measured. The larger the initial temperature difference between the probe and the environment to be measured, the more time temperature equilibration requires. This time can be shortened, and errors avoided, by using the probe configuration that fits best for your application. In extreme situations, condensation may occur on the sensors when the probe is colder than the environment. As long as the humidity / temperature limits of the humidity sensor are not exceeded, condensation does not alter the calibration of the sensor. However, the sensor has to dry out before it can provide a valid measurement. Non-moving air is an excellent insulator. When there is no air movement, surprising differences in temperature and humidity can be noted over short distances. Air movement at the probe generally results in measurements that are both faster and more accurate.

Unit system

Press the MENU key and select Device Settings > Local Settings > Unit Sys. Press ENTER to activate the Unit Sys menu item, use the UP or DOWN arrow key to change the unit system (Metric/Englisch). Press ENTER to confirm and press MENU to exit. The HW4 software can also be used to change the unit system.

Date and time

Press the MENU key and select Device Settings > Date or Time. Press ENTER to activate either the Date or the Time menu item, use the UP or DOWN arrow key to change the Date or the Time. After each change, the cursor moves to the right. When done, press ENTER to confirm and press MENU to exit. To change either the date or the time format, Press the MENU key and select Device Settings > Local Settings > Date Fmt or Time Fmt. Press ENTER to activate either the Date Fmt or the Time Fmt menu item, use the UP or DOWN arrow key to change the Date or the Time format. When done, press ENTER to confirm and press MENU to exit.

The HW4 software can also be used to set the clock of the HP23 to the PC date and time.

Select the calculated parameter for a probe input

The calculated parameter is available only when the input is set for a digital HygroClip2 probe. Press the MENU key and select Device Settings > Input 1 or Input 2 > Calc. Press ENTER to activate the Calc sub-menu, use the UP or DOWN arrow key to select the calculated parameter. Press ENTER to confirm and press MENU to exit.

Select which probe and/or parameters are shown on the display

Press the MENU key and select Device Settings > Display Settings > Mode. Press ENTER to activate the Mode menu item, use the UP or DOWN arrow key to select the display mode. Press ENTER to confirm and press MENU to exit. Depending on the display mode, use the UP or DOWN arrow key to change the probe and/or parameter being displayed. NOTE: The calculated parameter (HygroClip2 probe only) is shown only if enabled for the probe input that is selected (MENU > Device Settings > Input 1 or Input 2 > Calc).

Set input 1 or 2 for a digital or analog probe

Press the MENU key and select Device Settings > Input 1 or Input 2 > Pbe Type. Press ENTER to activate the Pbe Type menu item, use the UP or DOWN arrow key to change the probe type. Press ENTER to confirm and press MENU to exit.

When using an analog probe, be sure to define both the voltage signal range (U min. & U max.) and the measuring range (Range min. & Range min.) of the probe. HW4 is required to define the unit of measurement of an analog probe.

The HW4 software can also be used to change the probe type for each input.

Data capture

Manual data capture is available in the HP23 standard operating mode. Up to 250 relative humidity and temperature records can be manually captured to each of the 8 data-bins. The captured data is automatically date and time stamped. The calculated parameter cannot be captured. A descriptive name can be given to each data-bin with the HW4 software (laboratory, warehouse, etc.)

Capturing data

- Use the UP or DOWN arrow key to select the probe, press ENTER
- Select the data-bin with the UP or DOWN arrow key
- Press the ENTER key to activate the Data Capture function
- Data capture is confirmed on the HP23 display
- Wait a few seconds or press MENU to EXIT the Data Capture function

Viewing the captured data

Press the MENU key and select Data Capture. Press ENTER to activate the Data Capture menu item. Use the UP or DOWN arrow key to select the data-bin to be viewed. Press ENTER to confirm and open the data-bin sub-menu. Use the UP or DOWN arrow key to select a menu item and press ENTER to confirm:

View Data	Summary
View individual data records	View the maximum, minimum and average values

Clear Data: Erase the contents of the data-bin press MENU to exit.

Data logging

The HP 23 can log up to 10,000 relative humidity and temperature values provided by a single HygroClip2 probe or up to 20,000 data values provided by a single 1-channel analog probe. Both probe inputs can be logged at the same time and in that case the recording capacity per probe is cut in half. Each record is automatically date and time stamped. The calculated parameter cannot be recorded.

Logging data

- The data logging settings apply to both probe inputs
- Data logging starts and ends simultaneously for both probe inputs
- The log data function settings cannot be changed as long as data logging is active

Configure the data logging function and start recording data:

- Press the MENU key and select "Data Logging". Press ENTER to activate the Data Logging menu.
- Use the UP or DOWN arrow key to select Settings. Press ENTER to confirm and open the Settings sub-menu. Use the UP or DOWN arrow key to select a menu item and press ENTER to confirm:
- Select Interval (log interval). Press ENTER to activate the Interval menu item and use the UP or DOWN arrow key to change the log interval. Press ENTER after each change to confirm and move the cursor to the right. When done, press ENTER to confirm and exit
- Use the UP or DOWN arrow key to select the Mode menu item. Press ENTER to activate the Mode menu item and use the UP or DOWN arrow key to change the logging mode: - Start-Stop the recording will stop when the memory is full - Loop: when the memory is full the oldest record will be dumped to make room for the next record When done, press ENTER to confirm and exit
- Use the UP or DOWN arrow key to select each probe to be logged. Press ENTER to activate the Probe 1 or Probe 2 menu item and use the UP or DOWN arrow key to enable data logging Press ENTER to confirm and exit
- Press the MENU key and use the UP arrow key to select Start Recording
- Press the ENTER key twice to start recording data
- The HP23 automatically exits the data logging function and a diskette symbol appears at the bottom left of the display for each probe being recorded

Stop recording data:

Press the MENU key and select Data Logging. Press ENTER to activate the Data Logging menu item. Use the UP or DOWN arrow key to select Stop Recording. Press ENTER twice to confirm. The HP23 automatically exits the data logging function.

Viewing the recorded data

Data recorded with the HP23 data logging function can be viewed only after connecting the HP23 to a PC with the HW4 software running. For instructions see the following HW4 manual: **E-M-HW4v2-F2-012**

Technical data

Battery type: 9 V alkaline (standard) or Ni-MH 8.4V, 170...250mAh (rechargeable)

Environmental limits

Storage and transit: -20...70 °C / 0...100 %rh, non condensing
 Operating limits at electronics: -10...60 °C (limited by LC display) 0...100 %rh, non condensing
 Temperature limits at probe: Same as electronics, when not using a cable probe

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