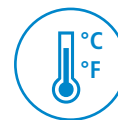


## DATA SHEET

# HD 110

## Thermo-hygrometer



Supplied with  
CALIBRATION  
certificate\*



Easy to use



Hold-min-max functions



Selection of units



Adjustable backlight

### Features

- Relative humidity, dew point and temperature measurements
- Selection of units (temperature and dew point)
- Hold Function
- Display of minimum and maximum values
- Configurable auto shut-off
- Backlight

### Technical specifications

| Parameters          | Measuring units                     | Accuracy**                                                                                                                                                                                                              | Measuring range                  | Resolution           |
|---------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------|
| Relative humidity   | %RH                                 | Accuracy* (Repeatability, linearity, hysteresis):<br>±1.8% RH (from 15 °C to 25 °C)<br>Factory calibration uncertainty: ±0.88% RH<br>Drift linked to the temperature: ±0.04 x (T-20) %RH<br>(if T < 15 °C or T > 25 °C) | From 5 to 95 %RH                 | 0.1 % RH             |
| Dew point           | °C <sub>td</sub> , °F <sub>td</sub> | ±0.8% of reading ±0.6 °C <sub>td</sub>                                                                                                                                                                                  | From -40 to +70 °C <sub>td</sub> | 0.1 °C <sub>td</sub> |
| Ambient temperature | °C, °F                              | ±0.4% of reading ±0.3 °C                                                                                                                                                                                                | From -20 to +70 °C               | 0.1 °C               |

\*Except class 110 S which is supplied with adjustment certificate.

\*\*All the accuracies indicated in this technical datasheet were stated in laboratory conditions, and can be guaranteed for measurements carried out in the same conditions, or carried out with calibration compensation.

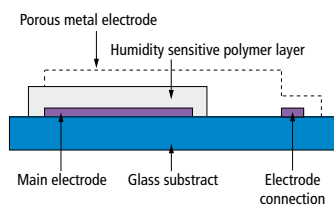
## General features

|                                   |                                                                                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Measuring element                 | Digital sensor (CMOS)                                                                                                                         |
| Display                           | 4 lines, LCD technology. Dimensions 50 x 36 mm<br>2 lines of 5 digits with 7 segments (value)<br>2 lines of 5 digits with 16 segments (units) |
| Cable                             | Coiled, 0.45 m length, expanding to 2.4 m                                                                                                     |
| Housing                           | ABS, protection IP54                                                                                                                          |
| Keypad                            | 5 keys                                                                                                                                        |
| European directives               | 2014/30/EU EMC; 2014/35/EU Low Voltage;<br>2011/65/EU RoHS II; 2012/19/EU WEEE                                                                |
| Power supply                      | 4 batteries AAA LR03 1.5 V                                                                                                                    |
| Battery life                      | 150 hours                                                                                                                                     |
| Ambience                          | Neutral gas                                                                                                                                   |
| Conditions of use<br>(°C, %RH, m) | From -10 to +50 °C. In non condensing conditions. From 0 to 2000 m.                                                                           |
| Operating temperature<br>(probe)  | From -20 to +70 °C                                                                                                                            |
| Storage temperature               | From -20 to +80 °C                                                                                                                            |
| Auto shut-off                     | Adjustable from 0 to 120 min                                                                                                                  |
| Weight                            | 310 g                                                                                                                                         |

## Operating principle

### Measurement of capacitive hygrometry

On the capacitive probes, a sensitive polymer layer reacts with the humidity present between two metal layers which cover a glass substract. Water absorption is a function of relative humidity of the surrounding environment, and modifies the dielectric constant. The measured signal is directly proportional to the relative humidity and independent on the ambient pressure.



$$C(RH) = \frac{\epsilon_{RH} \times \epsilon_0 \times A}{d}$$

C = Capacity of relative humidity sensor  
 $\epsilon_{RH}$  = Relative dielectric permittivity, humidity dependent  
 $\epsilon_0$  = Void permittivity

A = Electrodes area  
d = Electrodes spacing  
RH = Relative humidity

### Semiconductor temperature sensor

The direct tension of a silicon diode is dependent on the temperature, in accordance with the following equation:

$$V_{BE} = V_{GO} (1 - T/T_0) + V_{BE0} (T/T_0) + (nKT/q) \ln(T_0/T) + (KT/q) \ln(IC/IC_0)$$

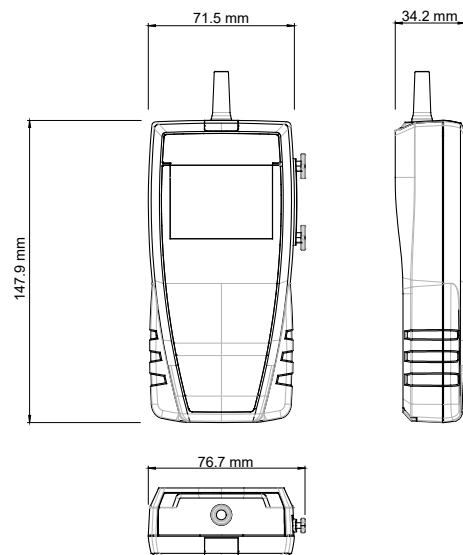
T = Temperature in Kelvin  
 $V_{GO}$  = Voltage of the band gap at the absolute zero  
 $V_{BE0}$  = Voltage of the band gap at  $T_0$  and  $IC_0$

K = Boltzmann constant  
q = charge of an electron  
n = Dependent constant of the instrument

## Maintenance

We carry out calibration, adjustment and maintenance of your instruments to guarantee a constant level of quality of your measurements. As part of Quality Assurance Standards, we recommend you to carry out a yearly checking.

## Dimensions (in mm)



## Kit content

| Designation | Sales reference | Description                                                                                                     |
|-------------|-----------------|-----------------------------------------------------------------------------------------------------------------|
| HD 110      | 24614           | Thermo-hygrometer with hygrometry probe Ø 13 mm, 110 mm length, calibration certificate and soft transport case |
| HD 110 S    | 24715           | Thermo-hygrometer with hygrometry probe Ø 13 mm, 110 mm length, adjustment certificate and soft transport case  |

## Certificates

**Calibration certificate:** A calibration is a comparison of the values of the instrument with those of a standard to determine a measurement error with an associated calibration uncertainty. A calibration certificate guarantees the traceability of measurements to national standards.

**Adjustment certificate:** An adjustment certificate is a document that ensures the conformity of the device with the tolerances of the data sheet. It ensures that the device has followed the manufacturing process.

## Accessories

| Designation | Sales reference | Description                                          |
|-------------|-----------------|------------------------------------------------------|
| CQ 15       | 24633           | Magnetic protective housing                          |
| RTE         | 24632           | Telescopic extension, 1 m length, with index at ±90° |
| MT 51       | 24636           | ABS transport case                                   |
| ST 110      | 24635           | Soft transport case                                  |