

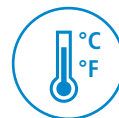
Supplied with
CALIBRATION
certificate*



DATA SHEET

HD 110

Thermo-hygrometer



Easy to use



Selection of units



Hold-min-max functions



Adjustable backlight

Thermo-hygrometers are commonly utilized in the evaluation of heating, ventilation, and HVAC systems. They are also valuable for assessing air quality in enclosed spaces used for various testing applications, particularly when humidity levels may influence test outcomes.

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): $\pm 1.8\% \text{ RH}$ (from 59 °F to 77 °F / from 15 °C to 25 °C) Factory calibration uncertainty: $\pm 0.88\% \text{ RH}$ Drift linked to the temperature: $\pm 0.04 \times (T - 20)\% \text{ RH}$ (if $T < 59\text{ °F}$ or $T > 77\text{ °F}$ / if $T < 15\text{ °C}$ or $T > 25\text{ °C}$)	From 5 to 95 %RH	0.1 %RH
Dew point	$^{\circ}\text{C}_{\text{td}}$, $^{\circ}\text{F}_{\text{td}}$	$\pm 0.8\%$ of reading $\pm 1.0\text{ }^{\circ}\text{F}_{\text{td}}$ ($\pm 0.8\%$ of reading $\pm 0.6\text{ }^{\circ}\text{C}_{\text{td}}$)	From -40 to +158 $^{\circ}\text{F}_{\text{td}}$ (from -40 to +70 $^{\circ}\text{C}_{\text{td}}$)	0.1 $^{\circ}\text{F}_{\text{td}}$ (0.1 $^{\circ}\text{C}_{\text{td}}$)
Ambient temperature	$^{\circ}\text{C}$, $^{\circ}\text{F}$	$\pm 0.4\%$ of reading $\pm 0.55\text{ }^{\circ}\text{F}$ ($\pm 0.4\%$ of reading $\pm 0.3\text{ }^{\circ}\text{C}$)	From -4 to +158 $^{\circ}\text{F}$ (from -20 to +70 $^{\circ}\text{C}$)	0.1 $^{\circ}\text{F}$ (0.1 $^{\circ}\text{C}$)

*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.

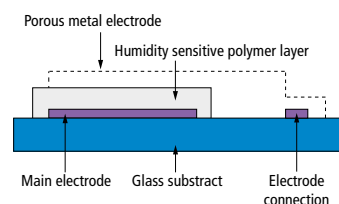
General features

Measuring element	Digital sensor (CMOS)
Display	4 lines, LCD technology. Dimensions 1 31/32" x 1 13/32" (50 x 36 mm) 2 lines of 5 digits with 7 segments (value) 2 lines of 5 digits with 16 segments (units)
Cable	Coiled, 17 23/32" (0.45 m) length, expanding to 94 1/2" (2.4 m)
Housing	ABS, protection IP54
Keypad	5 keys
Standards	2014/30/EU EMC; 2014/35/EU Low Voltage; 2011/65/EU RoHS II; 2012/19/EU WEEE; FCC part 15
Power supply	4 batteries AAA LR03 1.5 V
Battery life	150 hours
Ambience	Neutral gas
Conditions of use °F (°C), %RH, yd (m)	From 14 to +122 °F (from -10 to +50 °C). In non condensing conditions. From 0 to 2,188 yd (from 0 to 2,000 m)
Operating temperature (probe)	From -4 to +158 °F (from -20 to +70 °C)
Storage temperature	From -4 to +176 °F (-20 to +80 °C)
Auto shut-off	Adjustable from 0 to 120 min
Weight	0.683 lbs (310 g)

Operating principle

Measurement of Capacitive Hygrometry

In capacitive probes, a sensitive polymer layer responds to the humidity trapped between two metal layers on a glass substrate. The amount of water absorbed is influenced by the relative humidity of the surrounding environment, which changes the dielectric constant. The measured signal is directly proportional to the relative humidity and is unaffected by ambient pressure.



C = Capacity of relative humidity sensor
 ϵ_{RH} = Relative dielectric permittivity, humidity dependent
 ϵ_0 = Void permittivity

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

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

Semiconductor Temperature Sensor

The forward voltage of a silicon diode changes with temperature, following the equation below:

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

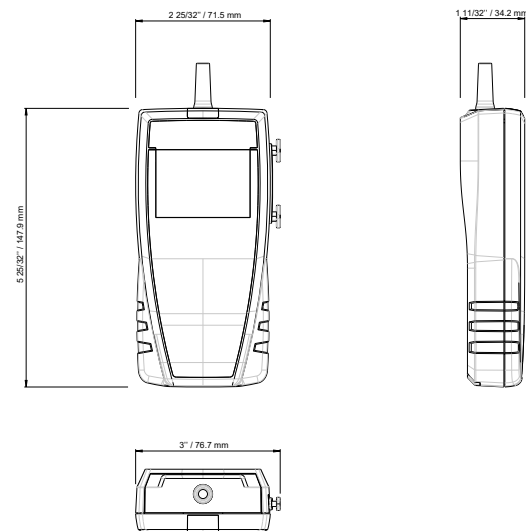
T = Temperature in Kelvin
 V_{GO} = Voltage of the band gap at the absolute zero
 V_{BEO} = Voltage of the band gap at T_0 and IC_0

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

Maintenance

We provide calibration, adjustment, and maintenance for your instruments to ensure consistent measurement quality. As part of our Quality Assurance Standards, we recommend conducting an annual check-up.

Dimensions (in "/>



Kit content

Model	Part number	Description
HD 110	24614	Thermo-hygrometer with hygrometry probe Ø 1/2" (13 mm), 4 11/32" (110 mm) length, calibration certificate and soft transport case
HD 110 S	24715	Thermo-hygrometer with hygrometry probe Ø 1/2" (13 mm), 4 11/32" (110 mm) length, adjustment certificate and soft transport case

Certificates

Calibration Certificate

Involves comparing an instrument's values to a standard to determine measurement errors and associated uncertainties. A calibration certificate ensures that measurements are traceable to national standards.

Adjustment Certificate

A document that verifies a device's conformity with the tolerances specified in its data sheet. It confirms that the device has adhered to the manufacturing process.

Accessories

Model	Part Number	Description
CQ 15	24633	Magnetic protective housing
RTE	24632	Telescopic extension, 39 3/8" (1 m) length, with index at ±90°
ST 110	24635	Soft transport case