sauermann®

DATA SHEET

HD 110

Thermo-hygrometer

- Easy to use
- Selection of units
- Hold-min-max functions
- Adjustable blacklight

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

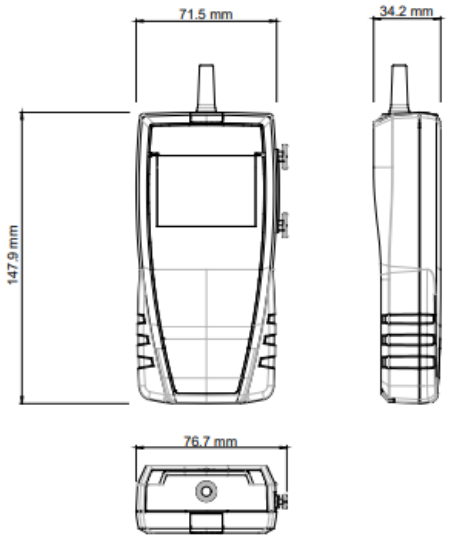
Parameters	Measuring units	Accuray**	Measuring range	Resolution
Relative humidity	%RH	**Accuracy* (Repetability, linearity, hysteresis):** ±1.8% RH (from 15 °C to 25 °C) **Factory calibration uncertainty:** ±0.88% RH **Drift linked to the temperature:** ±0.04 x (T-20) %RH (if T < 15 °C or T > 25 °C)	From 5 to 95 %RH	0.1 % RH
Dew point	$°C_{td}$, $°F_{td}$	±0.8% of reading ±0.6 $°C_{td}$	From -40 to +70 $°C_{td}$	0.1 $°C_{td}$
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 2 lines of 5 digits with 7 segments (value) 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; 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 (°C, %RH, m)	From -10 to +50 °C. In non condensing conditions. From 0 to 2000 m.
Operating temperature (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

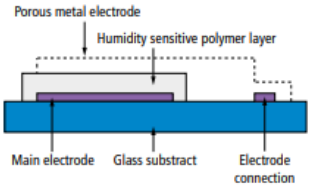
Dimensions (in mm)



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.



$$C(RH) = \frac{\xi_{RH} \times \xi_0 \times A}{d}$$

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

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

Semiconductor temperature sensor

$$V_{BE} = V_{G0}(1-T/T_0)+V_{BE0}(T/T_0)+(nKT/q)\ln(T_0/T)+(KT/q)\ln(IC/IC_0)$$

T = Temperature in Kelvin
V_{G0} = 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.

Kit content

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

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