KIMO INSTRUMENTS

Technical Data Sheet

Pressure / Temperature / Humidity / Air Velocity / Airflow / Sound level

CE

Thermo-hygrometer
HD 110

KEY POINTS

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

TECHNICAL FEATURES

Measuring element	Digital sensor (CMOS)
Display	4 lines, LCD technology. Sizes 50 x 36 mm 2 lines of 5 digits with 7 segments (value) 2 lines of 5 digits with 16 segments (units)
Cable	Coiled, length 0.45 m, expanding to 2.4 m
Housing	ABS, protection IP54
Keypad	5 keys
Conformity	Directives CEM 2004/108/CE and NF EN 61010-1
Power supply	4 batteries AAA LR03 1.5 V
Battery life	150 hours
Ambiance	Neutral gas
Operating temperature (instrument)	From -10 to +50 °C
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

SPECIFICATIONS

Measuring units	Measuring range	Accuracy[1]	Resolution
Relative humidity			
%HR	From 5 to 95 %HR	**Accuracy* (Repetability, linearity, hysteresys) :** ±1,8 %HR (from 15 °C to 25 °C) **Factory calibration uncertainty :** ±0,88 %HR **Drift linked to the temperature :** ±0,04 x (T-20) %HR (fi T < 15°C or T > 25°C)	0,1 %HR
Dew point			
$°C_{td}$, $°F_{td}$	From -40 to +70 $°C_{td}$	±0.8% of reading ±0.6$°C_{td}$	0,1 $°C_{td}$
Ambient temperature			
°C, °F	From -20 to +70 °C	±0.4% of reading ±0.3°C	0,1 °C

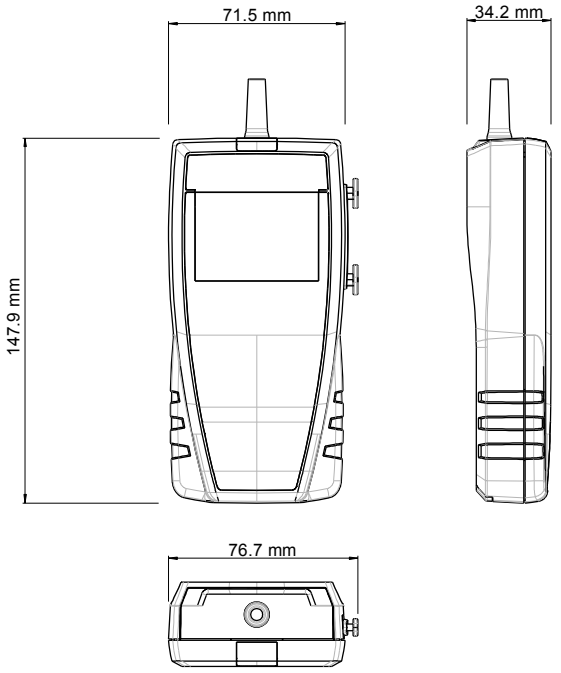
*All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation. As per NFX 15-113 and the Charter 2000/2001 HYGROMETERS, GAL (Guaranteed Accuracy Limit) which has been calculated with a coverage factor value of 2 is ±2.68%RH between 15 and 25°C on the measuring range from 5 to 95%RH. Sensor drift is less than 1%RH/year.

*Except class 110 S

FUNCTIONS

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

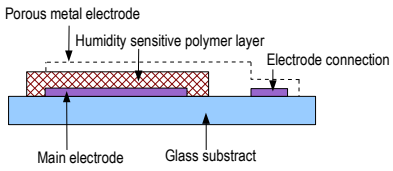
DIMENSIONS



OPERATING PRINCIPLES

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} P Relative dielectric permittivity, humidity dependent
ε_O Void permittivity
A Electrodes area
d Electrodes spacing
HR Relative humidity

Semiconductor temperature sensor

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

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

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

SUPPLIED WITH

The instruments are supplied with :
- Hygrometry probe Ø 13 mm, lg. 110 mm
- Calibration certificate*
- Transport case (ref : ST 110)

*Except class 110 S

ACCESSORIES

CQ 15 : Magnetic protective housing

RTE : Telescopic extension
Length 1m, with index at ±90°

MT 51 : ABS transport case

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 an annual verification.

GUARANTEE

Instruments have 1-year guarantee for any manufacturing defect (return to our After-Sales Service required for appraisal).

KIMO INSTRUMENTS

User manual

Pressure / Temperature / Humidity / Air velocity / Airflow / Sound level

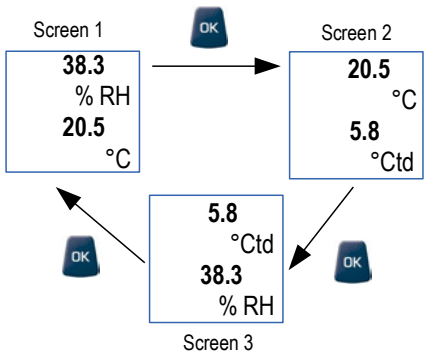
Thermo-hygrometer

HD110

DESCRIPTION OF THE DEVICE

PERFOM A MESUREAMENT

- Turn on the device by pressing on « **On/Off/Esc** ».
  *The device displays its name « **HD110** » then the measured values.*
- Put the probe to the required location.
  The device displays the temperature and hygrometry measurements.
- Press on « **OK** ».
  The device displays the dew point measurement with the temperature measurement.
- Press again on « **OK** ».
  The device displays the dew point measurement with the hygrometry measurement.



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FIREEZE THE MEASUREMENT

During the measurement :

- Press on « **Hold/min/max** » to freeze the measurement.
  *« **Hold** » displays on screen and the measurements are frozen.*
- Press on « **On/Off/Esc** » to exit the hold function.
  The device returns to the measurements display.

DISPLAY THE MINIMUM AND THE MAXIMUM

Once the measurement is frozen :

- Press on « **Hold/min/max** ».
  The device displays the maximum value of hygrometry measured since the last questioning at the top of the screen and the minimum value of hygrometry measured since the last questioning at the bottom of the screen.
- Press on « **Hold/min/max** ».
  The device displays the maximum value of temperature measured since the last questioning at the top of the screen and the minimum value measured since the last questioning at the bottom of the screen.
- Press again on « **Hold/min/max** ».
  The device displays the maximum value of dew point measured since the last questioning at the top of the screen and the minimum value of dew point measured since the last questioning at the bottom of the screen
- Press on « **On/Off/Esc** » to return to the measurements display.

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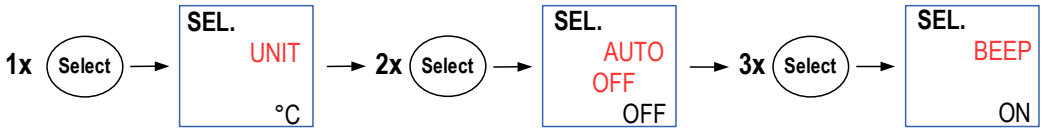
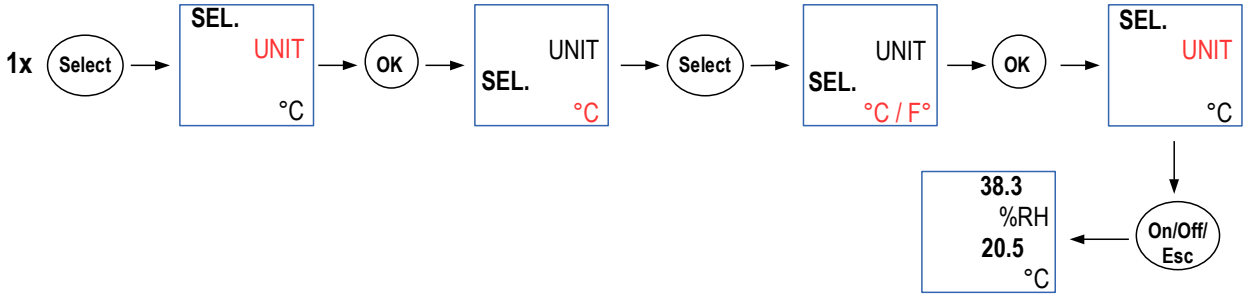
ADJUST THE DEVICE

- **Device drop-down menu**



Select the measuring unit :

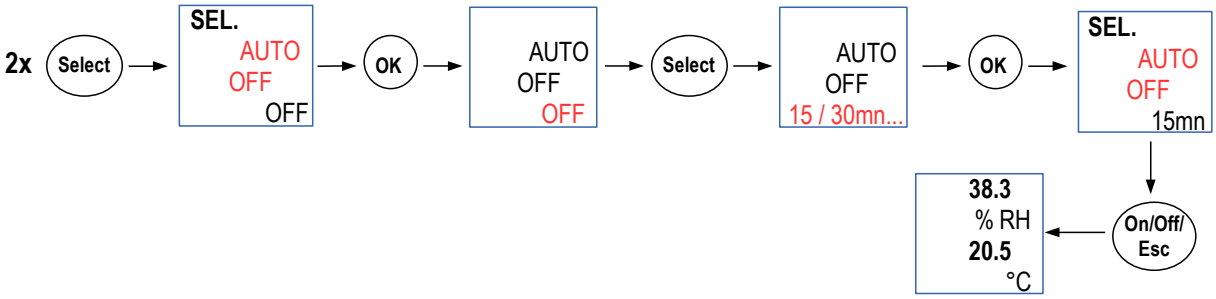
- Press on « **Select** ».
  *« **UNIT** » blinks on screen.*
- Press on « **OK** », the measuring unit currently used blinks at the bottom of the screen.
- Press on « **Select »** to select the required measuring unit : °C or °F.
- Press on « **OK** » to validate.
  *« **UNIT** » blinks on screen.*
- Press on « **On/Off/Esc** » to return to the measurement.



Adjust the auto shut-off :

The device is on and displays the measurements.

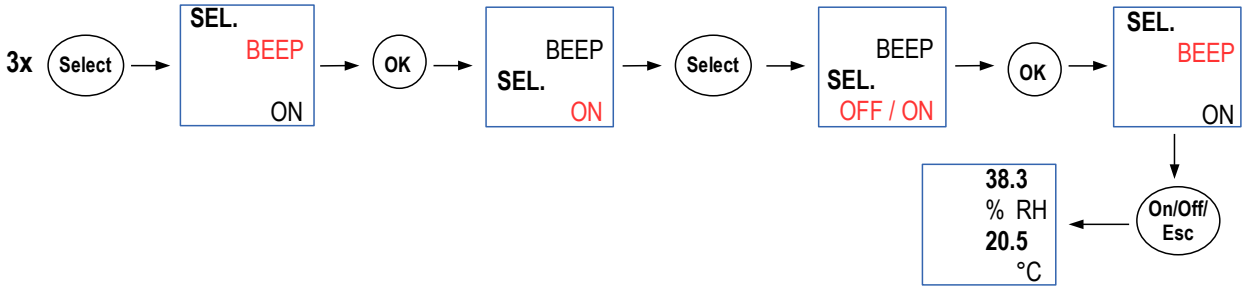
- Press on « **Select** » until « **AUTO OFF**» blinks on screen.
- Press on « **OK** ».
  The time before auto shut-off blinks on screen.
- Press on « **Select** » to select the time before device auto shut-off : 15, 30, 45, 60, 75, 90, 105, 120 minutes or OFF.
- Press on « **OK** » to validate.
- Press on « **On/Off/Esc** » to return to the measurement.



Activate or deactivate the keys beep :

The device is on and displays the measurements.

- Press on « **Select** » until « **BEEP** » blinks on screen.
- Press on « **OK** ».
  *« **OFF** » or « **ON** » blinks on screen.*
- Press on « **Select** » to activate the keys beep « **ON** » or deactivate the keys beep « **OFF** ».
- Press on « **OK** » to validate.
- Press on « **On/Off/Esc** » to return to the measurement.



ACTIVATE THE BACKLIGHT

- Press on « **Backlight** » :  to activate the device backlight.
- To deactivate the backlight press again on « **Backlight** ».

CHANGE THE BATTERIES

- Remove the front part at the back of the device.
- Change the old batteries by AAA LR03 1.5 V batteries.
- Replace the front part.