KIMO®
INSTRUMENTS



USER MANUAL

AMI 310

MULTIFUNCTION INSTRUMENT

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1.1 Instrument description



1.2 Remove battery

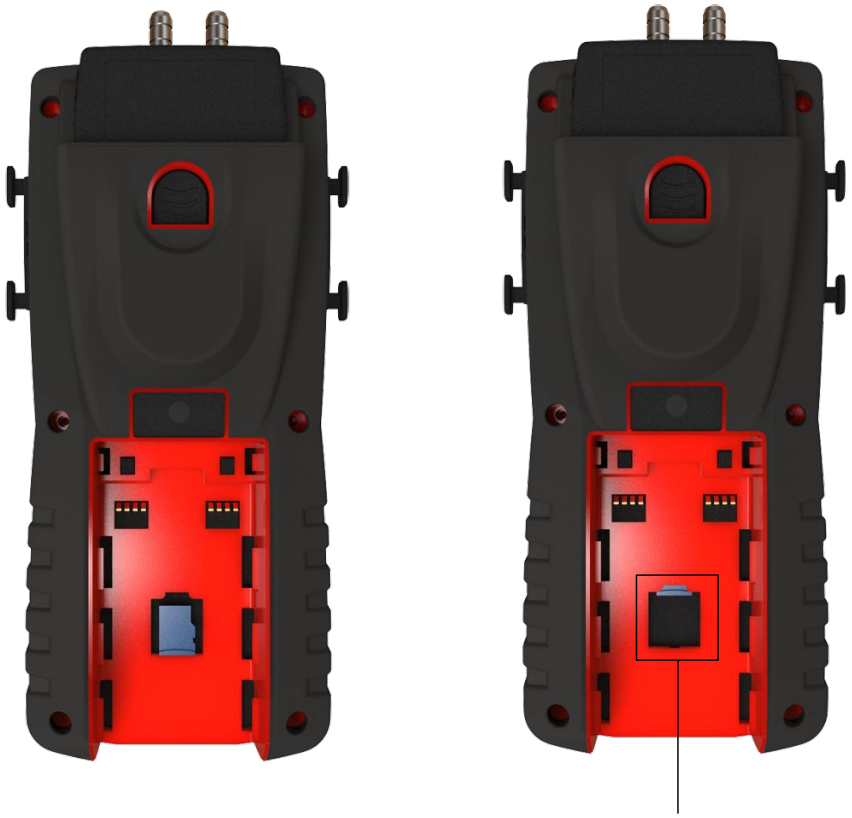
- Turn off the instrument.
- Turn it over.
- Press the red button while sliding down the battery.



1.3 Insert SD card

It is possible to insert a SD card in the AMI310 in order to increase its memory.

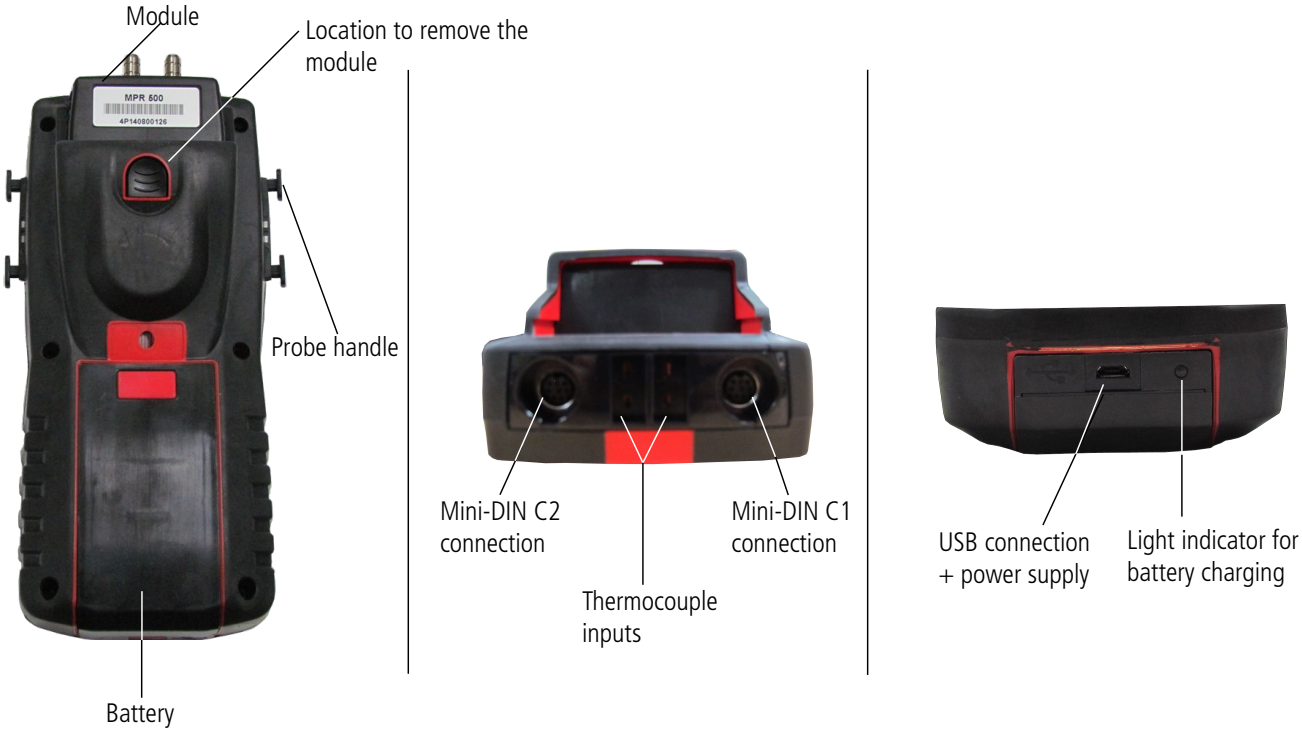
- Turn off the instrument.
- Remove the battery.
- Insert the SD card in its location.
- Put the battery.



SD card properly inserted

1.4 Directive 2014/53/EU

Hereby, Kimo SAS declares that the radio equipment type AMI 310 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: kimo-instruments.com



2.1 Main features

- Screen

320 x 240 pixels graphic display, colour screen and backlight. Display of 6 measurements, 4 simultaneously.
Size: 71 x 53 mm.

- Printer (available as option)

The paper of the instrument is a thermal paper with a 10-year guarantee. It has an easy replacement system of the paper (Easyload). In addition, printing is fast.

- Battery

Rechargeable Li-ion battery inside the instrument, 16 h battery-life with a pressure module or 14 h a hotwire probe. The instrument is supplied with a 5 V, 1 A power adapter to load the internal battery. The current loading is indicated by a battery symbol on the top left of the screen. The orange led on the bottom of the instrument is also on until the full loading of the battery (the led turns green).

2.2 Connections

- Interchangeable modules

The interchangeable modules have the SMART-2014 system and are automatically recognized once the connection is made on the instrument.

Thermocouple module:



Allows to measure temperature on Tc1, Tc2, Tc3 and Tc4 channels with wired thermocouples K, J, T or S probes ended with a male miniature connector

Pressure module:



Allows to measure the differential pressure **ΔP** and to calculate air velocity and airflow with a **Pitot tube** or **Debimo blades.** It also measures the thermocouple temperature with a wired thermocouple probe ended with a male miniature connector.

Climatic conditions module:



Allows to measure hygrometry, ambient temperature and atmospheric pressure.

U coefficient module:



Allows to calculate the U coefficient thanks to the average of 3 contact temperature probes, the T thermocouple ambient temperature and the measurement of external temperature (manually entered or measured by a wireless temperature probe)

- Wire probes with SMART-2014 system

Wire probes with SMART 2014 system are automatically recognized when connected to the instrument.



C2 mini-DIN connection

C1 mini-DIN connection

Probes are connected on min-DIN connectors **C1** and / or **C2** (excepted thermocouple probes)



Overmolded mini-DIN connector with foolproofing system. Cable length 450 mm, extension 2.4 m.



Non-exhaustive list of probes

- Wireless probe / instrument communication

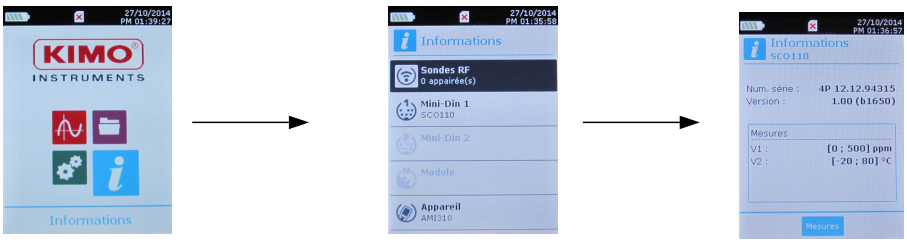
Wireless communication between probe and instrument with automatic recognition after power-up.



Wireless probes shall be located near the instrument for initial recognition. Connection between AMI 310 and wireless probes must be established.

3 INFORMATION

"Information" menu allows to view information about the instrument, probes and module connected to the **"Wireless probe"**, **"Mini-DIN 1"**, **"Mini-DIN 2"** or **"Module"** connections**.** To enter in this menu from home screen, select the **"Information"** menu with the arrow keys then press **OK**.



Available information for probes and module is:

- Type of probes and module
- Date of the last calibration or adjustment
- Serial number
- Firmware version
- Measuring range

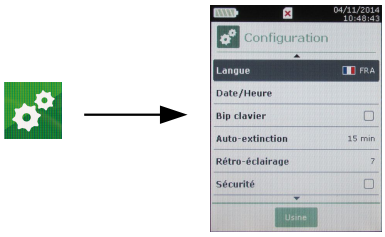
Available information for the instrument is:

- Type of instrument
- Date of the last calibration or adjustment
- Serial number
- Firmware version
- Measuring range

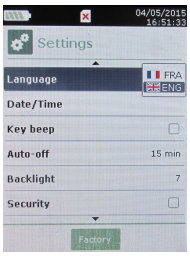
➢ The function key **"Measurement"** allows to access directly to the **"Measurement"** menu.

The instrument is on.

- With the arrow keys, go to **"Configuration"** menu. 
- Press **OK.**



4.1 Set language



"Configuration" *screen is displayed.*

- Select **"Language"** with the arrow keys then press **OK.**
  Available languages are displayed.
- Press Up and Down arrows to select the required language : FRA, ENG...
- Press **OK**.

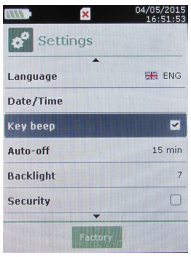
4.2 Set date and time



"Configuration" *screen is displayed.*

- Select **"Date/time"** with the arrow keys then press **OK.**
  The screen of configuration for date and time is displayed.
- Go to the **"Date"** format with arrow keys then press **OK**.
- Select : DD/MM/YYYY, MM/DD/YYYY or YYYY/MM/DD then press **OK**.
- Go to the day then press OK.
- With Up and Down keys, set the first digit of the day then go to the following one with right arrow.
- Press **OK** to validate.
  Perform the same procedure to set the month and year.
- Go the **"Time"** format with arrow keys then press **OK**.
- Select the time format : **"12H"** or **"4H"** then press **OK.**
  *If **"12H"** is selected, it is possible to choose between "AM" for ante meridiem or **"PM"** for post meridiem.*
- Press **OK**, select **"AM"** or **"PM"** then press OK to validate.
- Go the time then press OK.
- With Up and Down keys set the first digit of the day then go to the following one with right arrow.
- Press **OK** to validate.
  Perform the same procedure to set minutes and seconds.
- Press function key **"Validate"** to leave the screen and to save modifications or press **Esc** to cancel.

4.3 Activate or deactivate the beep key



"Configuration" *screen is displayed.*

- Select **"Key beep"** with arrow keys.
- Press OK to activate or deactivate the beep key.
  The box is ticked if the beep is activated and unticked when the beep is deactivated.

4.4 Set auto-off



The auto-off function turns off the instrument after a moment of unused.
It is possible to set the auto-off of the instrument at 15 / 30 / 45 / 60 / 75 / 90 / 105 or 120 minutes or to deactivate it.

"Configuration" screen is displayed.

- Select **"Auto-off"** with arrow keys then press **OK.**
- Select the required duration or OFF to deactivate it with Up and Down keys.
- Press **OK** to validate.

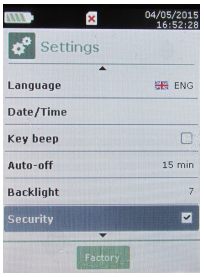


4.5 Set backlight

"Configuration" screen is displayed.

- Select "Backlight" with arrow keys then press **OK.**
- Select the backlight level between **1 and 9** or **"Auto"** with Up and Down keys.
- Press **OK** to validate.

4.6 Set security

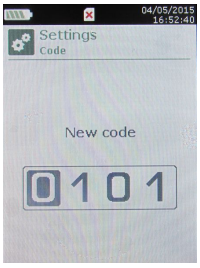


This part allows to activate or deactivate a security code. This code will be asked when starting the instrument.

"Configuration" screen is displayed.

- Select **"Security"** with arrow keys.
- Press **OK** to activate or deactivated the security.
  If the security is activated, please create a security code.

4.7 Set code



If the security is activated, the selected code will be asked when starting the instrument.
"Configuration" screen is displayed and the security is activated.

- **Go to "Code"** then press **OK.**
- With arrow keys, set each digit then press OK when the last digit is set.
  Modifications are validated, the instrument backs to "Configuration" screen.

4.8 Set printing

"Configuration" screen is displayed.



- Select **"Printing"** with arrow keys then press **OK.**
- Go to **"Format"** then press **OK.**
- Select the ticket format : long or short then press **OK**.
  Long ticket format : *prints the measurement results + header (operator name, date and time of the intervention, type of instrument and its serial number)*
  Short ticket format : *prints only the measurement results and the serial number of the instrument*
- Go to **"Logo"** then press **OK** to activate or deactivate it.
  The box is ticked when the logo is activated and unticked when the logo is deactivated.
- Go to **"Operator"** to enter an operator name then press **OK**.
  Keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.

To go from the lower case keypad to the upper case keypad then to the numeric keypad : press the function key : **aA1**
*To delete a letter press the function key **"Delete"**.*

- Press the function key "Validate" to validate the name.
- Go to **"Header 1"** to enter the header name then press **OK**.
  Keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
- Press the function key **"Validate"** to validate the header 1.
- Perform the same procedure to enter a name for the **"Header 2"**, **"Header 3"** and **"Header 4"**.
- Press **ESC** to back to the "**Configuration"** screen and to validate the modifications.

5.1 Use of the wire probes and modules

- **Connect a probe**

  ➢ Connect the mini-DIN cable on the mini-DIN connection of the probe.
  ➢ Connect the mini-DIN cable with the probe on the instrument.
  A beep indicates that the operation has been correctly performed.



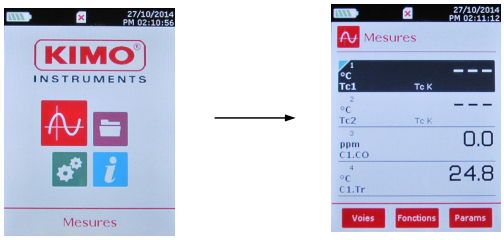
Probe connection



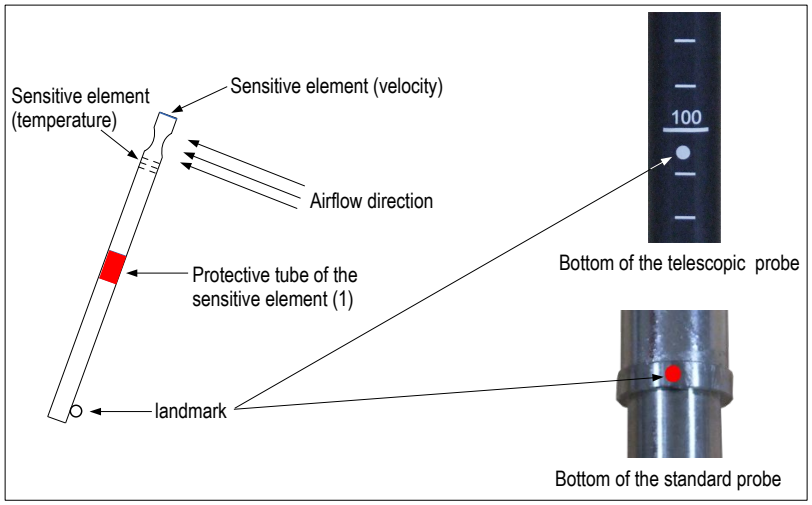
Instrument connection

➢ Go to **"Measurement"** menu from the home screen.

➢ Press **OK**
Measurement are displayed.



5.2 Special precautions for air velocity probes



Before any use of the device with an air velocity probe, please lower the protective tube (1) of the sensitive element (except vane probe).
Always use the standard air velocity probe with the red point in front of the flow.
Always use the telescopic probe with the white point in front of the flow.

5.3 *Use of wireless probes*

- **Add a wireless probe**



With arrow keys, go to **"Information"** menu then press **OK**.



In **"Information"** menu go to **"Wireless probe"** then press **OK.**



On the bottom of the screen press the function key **"Create"**.



Turn on the wireless probe and keep it press until the light blinks

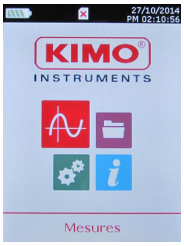


Pairing is in progress



The probe information is displayed With the function key **"Meas."** It is possible to back to the measurement screen. It is also possible to delete the wireless probe pressing the function key **"Delete"**.

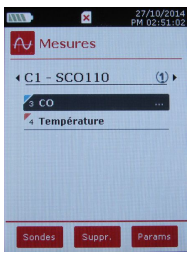
OR



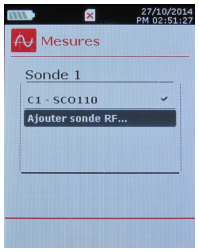
With arrow keys, go to **"Measurements"** menu then press **OK**.



In **"Measurement"** menu, press the function key **"Channels"**.



Press the function key **"Probes".**



With the arrow keys, select **"Add wireless probe..."** then press **OK.**



On the bottom of the screen press the function key **"Create"**.



Turn on the wireless probe and keep it press until the light blinks



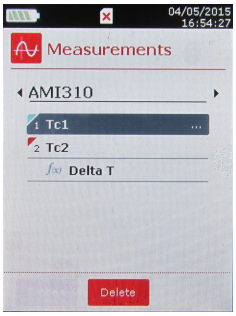
Pairing is in progress



The probe information is displayed With the function key **"Meas."** It is possible to back to the measurement screen. It is also possible to delete the wireless probe pressing the function key **"Delete"**.

6 CHANNEL CONFIGURATION

The channel configuration allows to modify the displaying of the measured parameters.



The instrument is on.

- With the arrow keys, go to "**Measurement**". 
- Press **OK.**
- Press the function key **"Channels"**.
  The different functions of the probe are displayed.

It is possible from the **"Channels"** menu to add or delete some measurements.

- Press the function key **"Delete"** in order to delete the selected measurement.
- Press the function key **"Add"** to display the selected measurement.
- Press **"Add"** to add a measurement on the screen (the default measurement displayed on the screen are the primary measurements).

It is possible from the **"Channels"** menu to choose the displaying order of the measurement on the screen.

- With arrow keys, select the measurement to modify and press **OK**.
- Go to the line **"Channel num."** then press **OK**.
- Select the channel number and press **OK**.

6.1 *In airflow mode*

Airflow:

In the **"channels"** menu:

- Select with arrow key the sub-menu **"Airflow"** then press **OK**.
- Select **"Channel num."** and press **OK.**
- Select a channel number and press **OK**.
- Go to the line **"Type"** then press **OK**.
- Select the required type : **"Rect", "Circ" Cone or "K factor"** and press **OK.**

  - If the type is **Rect** or **Circ**:
    - Go to **"Rect"** or **"Circ",** press **OK**, select its size then press **OK** to validate.
    - Go to the line **"Areas"** then press **OK**.
      It is possible to change units and size.
      - Select **"Unit"** with the arrow keys then press OK. Select **mm** or **in** and press **OK**.
      - To modify areas, select with arrow keys **"Rect."** or **"Circ."** and press **OK**.
      - Select the size to modify in the list and press **OK**.
      - Set the size with arrow keys between **1 and 2500 mm** then press **OK**.

  - Go to the line **"K2 fact."** and press **OK** to select or unselect the K2 factor.
    K2 factor is a coefficient which is applied to correct the flow rate only for the rectangular or circular surfaces.

  - If the airflow is calculated with a **pressure module** and if you have a pressure-reducing element, go to **"d/p elem."** to select the differential pressure element. Press OK then select the element between **"Pitot L"** (coefficient: 1.0015), **"Pitot S"** (coefficient: 0.84), **"Débimo"** (coefficient: 0.8165) and **"Other"**. If **"Other"** is selected, then enter its differential pressure coefficient between 0 and 9.9999.

  - If the airflow is calculated with a pressure module and without pressure-reducing element, the "K factor" type is available.
    - For a **K factor**: go to **"K factor"**, press **OK**, select the K factor then press **OK** to validate.
    - It is possible to modify the default values of the K factor between 0.1 and 9999.9 from the **"Factors"** menu.

➢ You will need to configure the pressure channel (even if you don't want to display it) and the airflow channel in the unit corresponding to your K factor value. Please use the correct pressure and airflow units associated with the value of the K factor to obtain a correct airflow value.

K factor: The airflow in a ventilation opening, where airflow = $Qv = K \times \sqrt{\Delta P}$, can be evaluated by the differential pressure on this ventilation opening and a K factor. This K factor is indicated in the technical characteristics of the aeraulic system provided by the manufacturer. This must indicate the units of pressure and airflow used to determine of K factor. If the K factor value and unit are not specified in the manufacturer's specifications, please contact the manufacturer.
Above means when you change the unit of airflow in the AMI310 the calculation of airflow is not changed/adjusted. Rather you should set the unit of airflow to match based on the unit used for pressure, and the K factor from the manufacturer.
For more information on how to correctly choose the unit of airflow, see document available on Sauermann's website.

For a hotwire probe, K factor is not available. It is possible to select **"Cone"** in addition to **"Rect"** and **"Circ"**:

➢ To select **"Cone"**, go to the line "**Cone"** then press **OK.**
- Select the type of cone: **K35**, **K75**, **K120** or **K150** and press **OK**.
- Press "**Measures"** to display the measurements.

For a Ø100 mm vane probe, K factor is not available. It is possible to select **"Cone"** in addition to **"Rect"** and **"Circ"**:

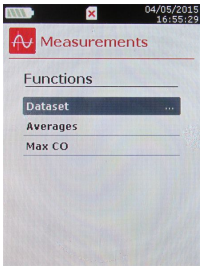
➢ To select **"Cone",** go to the line **"Cone"** then press **OK**.
- Select the type of cone: **K25** or **K85** and press **OK**.
- Press "**Measures"** to display the measurements.

6.2 Delta T

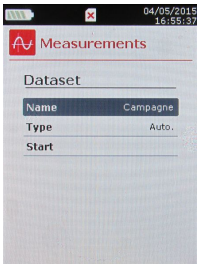
Delta T is a function which allows to define a temperature difference calculated between two temperature channels of the same type.

➢ Connect the thermocouple module then the probes.
In the **"Channels"** menu:
➢ Select with arrow keys the sub-menu **"Delta T"** then press **OK**.
➢ Select **"Channel number"** and press **OK**.
➢ Select a channel number and press **OK**.
➢ Select the channels in which Delta T will be calculated.
➢ Go to **"Channel A"** with arrow keys and press **OK.**
➢ Select the channel T1, T2, T3 or T4 and press **OK**.
➢ Go to **"Channel B"** with arrow keys and press **OK.**
➢ Select the channel T1, T2, T3 or T4 and press **OK**.
➢ Press the key **"Measurement"**.
The instrument displays the measurements.

The instrument in on.

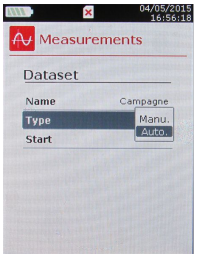


- Select with arrows keys **"Measurement"** menu.
- Press **OK.**
- Select with arrows keys the measurement in which the dataset will be performed.
- Press **"Functions"** key then select **"Dataset"** with arrow keys and press **OK**.
  Dataset menu is displayed.
- Go to line "**Name"** with arrow keys and press **OK.**
  A keypad is displayed on the bottom of the screen.



- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad: press the function key: aA1
  *To delete a letter press the function key **"Delete"**.*
- Press the function "Validate" to validate the name of the dataset.

A dataset is composed of several dated measuring points. You can choose between an automatic dataset or a manual dataset.



- Go to **"Type"** with arrow keys then press OK.
- Select **"Manu."** for manual or **"Auto."** for automatic.
- Go to **"Start"** then press **OK.**

7.1 Start and record datasets

7.1.1 Manual dataset

A **manual dataset** is composed of measuring points selected by the operator.

Manual mode is selected, measurements are displayed.

- Press **OK** to validate a measuring point.
- Press **OK** as many time as the required number of points.
- Press the function key **"Save"**.
  The instrument displays the measuring dataset : type of dataset, number of points, date, minimum, maximum, average and standard deviation.
  The dataset is automatically recorded.
- Press **OK** to display the graph of the results.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the dataset display.
- Press **Esc** to back to **"measurement"** menu.

7.1.2 Automatic dataset

An **automatic dataset** is composed of measuring points with interval of time.

Automatic mode is selected, measurements are displayed.

- Press the function key **"Duration"** to set the dataset duration.
- Press **OK** on the line **"Duration"**.
- Go to **"Hour"** with the arrow keys then press **OK**, set the duration with arrow keys then press OK**.**

- Perform the same procedure for the minutes and seconds.
- Press the function key **"Validate"** when the duration is set.
- Press **OK** on the line **"Interval"**.
- Go to **"min"** with the arrow keys then press **OK**, set the duration with arrow keys then press OK**.**
- Perform the same procedure for the seconds.
- Press the function key **"Validate"** when the interval is set.
- Press **Esc** to back to measuring dataset.
- Press the function key **"Start"** to launch the measuring dataset.
  The countdown starts.
    - It is possible to stop the measuring dataset by pressing the function key **"Stop"**.
    - Press "**Start"** to restart the dataset.
    - Press **"Duration"** to modify the duration.
    - Press **"Save"** to save the dataset.

  The instrument displays the measuring dataset : type of dataset, number of points, date, minimum, maximum, average and standard deviation.
  The dataset is automatically recorded.
- Press **OK** to display the graph of the results.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the dataset display.
- Press **Esc** to back to **"Measurement"** menu.

7.1.3 View the recorded datasets

- Go to the **"Dataset"** menu with the arrow keys from the home screen. 
  The different measuring datasets are displayed. They are listed by date.
- To delete all the datasets : press the function key **"Del all"**.
- To delete just one dataset : go to the dataset to delete with the arrow keys and press the function key **"Delete"**.
- A confirmation window opens : select **YES** to confirm the deletion or **NO** to cancel.

7.2 Launch and save averages

The instrument is on.
- Go to **"Measurement"** with the arrow keys. 
- Press **OK.**
- Press the function key **"Functions"** then select **"Averages"** then press **OK**.
  "Average" *menu is displayed.*

7.2.1 Point/Point average

This function allows to calculate the average value of various points that you can select.
- Go to **"Point/Point"** line in the "**Averages"** menu and press **OK**.
- Press OK to add measuring points.
  The instrument displays the type of dataset, number of points, date, minimum, maximum, average and standard deviation.
- Press the function key **"Details"** to get details for each point.
- Press the function key **"Save"** to save the Point/Point average.

A keypad is displayed on the bottom of the screen.

- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad : press the function key : aA1
  *To delete a letter press the function key **"Delete"**.*
- Press the function key **"Validate"** to validate the name.
  The recap of the Point/Point average is displayed.
- Press OK to display the graph.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the Point/point average display.
- Press **Esc** to back to **"Measurement"** menu.

7.2.2 Automatic average

This function allows to calculate an average value that the device measured in an interval chosen time.

- Go to **"Automatic"** line in the "**Averages"** menu and press **OK**.
- Press the function key **"Start"** to start the measurement.
  Duration is displayed.
- Press the function key **"Stop"** to stop the measurements.
  Measurements, average, minimum and maximum values, standard deviation and duration are displayed.
- Press the function key **"Start"** to launch a new automatic average.
- Press the function key **"Save"** to save the results.
  A keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad : press the function key : aA1
  *To delete a letter press the function key **"Delete"**.*
- Press the function key **"Validate"** to validate the name.
  The recap of the automatic average is displayed..
- Press OK to display the graph.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the automatic average display.
- Press **Esc** to back to **"Measurement"** menu.

7.2.3 Automatic Point/Point average

This function allows to calculate the average value of various points, calculated themselves on a duration beforehand defined.

- Go to **"Auto Pt/Pt"** line in the "**Averages"** menu and press **OK**.
  A duration is displayed on the bottom right of the screen.
- Press the function key **"Duration"** to modify the duration if necessary.
- Go to **"min"** with the arrow keys then press **OK**, set the duration with arrow keys then press OK**.**
- Perform the same procedure for the seconds.

- Press the function key **"Validate"** when the interval is set.
- Press **OK** to start the measurement.
  A the end of the measuring dataset, measurements, average, minimum and maximum values, standard deviation and duration are displayed.
- Press **OK** to add a new measuring point to the calculation.
  The countdown starts.
- Press the function key **"Details"** to get details of the results.
- Press the function key "**Save"** to save the results of the automatic average.
  A keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad : press the function key : **aA1**
  *To delete a letter press the function key **"Delete"**.*
- Press the function key **"Validate"** to validate the name.
  The recap of the dataset is displayed.
- Press **OK** to display the graph.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the automatic point/point average display.
- Press **Esc** to back to **"Measurement"** menu.

7.3 COmax

For a CO/temperature probe, it is possible to calculate a COmax. This function allows to measure on an adjustable duration the maximum value of CO reached during this time interval..

- In the **"Functions"** menu, select with arrow keys **"COmax"** then press OK.
  Measurements and a 30 s duration are displayed.
- Press the function key **"Duration"** to modify the countdown.
- Go to **"min"** with the arrow keys then press **OK**, set the duration with arrow keys then press OK**.**
- Perform the same procedure for the seconds.
- Press the function key **"Validate"** when the duration is set.
- Press the function key "Start" to launch the measurement dataset of COmax.
  - It is possible to stop the measuring dataset by pressing the function key **"Stop"**.
  - Press **"Start"** to restart the dataset.
  - Press **"Duration"** to modify the countdown.

  At the end of the duration, the instrument displays the results of COmax.
- Press **Esc** to back to **"Measurement"** menu.

7.4 Autozero

It is possible to perform an autozero with a pressure module.
This sub-function allows to manually compensate the potential deviations of the sensitive element over time through a manual adjustment of the zero.

7.4.1 Perform an autozero

For the 500 Pa pressure module with **solenoid valve:**

- In the menu **"Functions**", go to **"Autozero"** then press **OK**.

For 2500 Pa, 10000 Pa, 500 mbar and 2000 mbar pressure modules without **solenoid valve**:

- Unplug the 2 pressure connections tubes from the pressure module.
- In the menu **"Functions"**, go to **"Autozero"** then press **OK**.

7.4.2 Set an interval between 2 autozeros

This function is only available for 500 Pa pressure modules.

- Press the function key **"Params"** then press **OK**.
- Go to **"Interval AutoZ"** then press **OK**.
- Set the interval between 0 and 6 minutes.
- Press **Esc** to back to measuring screen.

7.5 Gas leak

- Connect the gas leak probe on the AMI310 then turn it on.

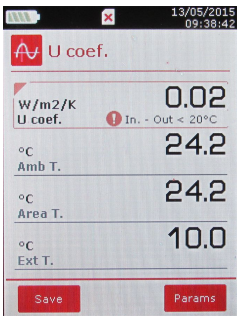
If the probe is connected for more than 1 minute, the measuring screen displays and shows the gas concentration.
If the probe is connected for less then 1 minute, the screen shows the remaining time of pre-heating then measurements are displayed.

- In the **"Functions"** menu, select with arrow keys **"Gas leak"** then press **OK**.
- Press **"Threshold"** to modify the alarm threshold. Use arrow keys to modify the threshold value then press **OK** to validate the threshold and back to measuring screen.
  The alarm threshold corresponds to the value on the right of the bargraph.
  When this threshold is exceeded, the instrument produces a continuous beep.

7.6 U coefficient

U coefficient module allows to calculate the thermal transmittance coefficient of a wall (U coefficient). U characterises the quantity of heat that goes through a wall in continuous operation. It is a key point to determine thermal leak. So it allows to estimate the insulation of a wall: the lower the value, the more insulated the wall.
For building renovations, this coefficient is one of the most important values to estimate the their loss and their energy use.

To use the U coefficient function, a U coefficient module must be connected and active.



- Go to **"Measurement"** menu then press OK.
- Press the function key **"Functions"** then go to **"U coeff."** with the arrow keys then press **OK**.
- Press the function keys **"Params"**, set the outdoor temperature with the arrow keys then press OK.
  The instrument makes the calculation of the U coefficient.
- Press **"Save"** to save the dataset.
  A window appears.
- Select **"Name"** then press **OK** to modify the name of the dataset.
  A keypad appears on the bottom of the screen.
- Select the letters with the arrow keys then press **OK**.
- Select **"Type"** then press OK to select the type of the dataset.
  - Select "**Manu"** whith the arrow keys then press OK.
  - Select **"Launch"** then press **OK**.
  - To save a measuring point, press OK.
  - Press **OK** as many time as the required number of points.
  - Press **"Save"** to save the dataset.
    The recap of the dataset is displayed.
  - Press **OK** to display the graph.

- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
- Press **"Esc"** to back to the **"U coeff"** menu.

OR

- Select **"Auto"** with arrow key and press **OK**.
- Select "Launch" and press OK.
- Press the function key **"Duration"**.
- Set the duration with the arrow keys and press OK.
- Press the function key **"Validate"** to validate the duration.
- Perform the same procedure to set the interval.
- Press **Esc** to back to the dataset.
- Press the function key "Start" to launch the dataset.
  - Press the function key **"Stop"** to stop the dataset.
  - Press the function key **"Start"** to launch a new calculation.
  - Press the function key "Save" to save the results.

  At the end of the dataset, the instrument displays the dataset recap, and the dataset is automatically recorded.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
- Press **"Esc"** to back to the **"U coeff"** menu.

7.7 Hold-Min./Max.

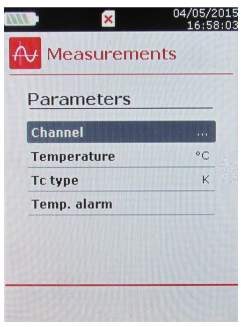
- Go to **"Measurement"** menu with the arrow keys and press **OK**.
  Measurements are displayed.
- Press OK.
  Measurements are frozen on the screen and the minimum and maximum values are displayed.

7.8 Turbulence index

- On main screen, select the **« Measurement »** menu with the arrow keys then press **OK**.
  Measurements are displayed.
- Press the function key **"Functions"**.
- Go to **"Turbulence"** with the arrow keys then press OK.
- Press the function key **"Start "** to start the measurements allowing to calculate the turbulence index.
  Measurements start and last for 3 minutes. The following values are displayed :
  - *turbulence index*
  - *temperature*
  - *air velocity*
- Press **Up** and **Down** keys to display alternatively the temperature and the air velocity
  At the end of the 3 minutes, the turbulence index is displayed.

The instrument is on.

- Go to **"Measurement"** menu with the arrow keys and press **OK**.
- Select the measurement to set with the arrow keys.
- Press the function key **"Params"**.
  The different parameters are displayed.



For all probes and modules, it is possible to modify the channel number.

- Select **"Channels"** with the arrow keys and press **OK**.
- Select **"Channel num."** and press **OK**.
- Select a channel number for the parameter, and press **OK**. This number defines the order display of the parameters.

8.1 Pressure module

8.1.1 Unit

Pressure:

- Go to the line **"Pressure"** and press **OK**.
- Select with the arrow keys the required unit: Pa, daPa, mmH_20, mmHg, mbar, hPa, inWg or kPa.
- Press **OK** to validate the unit selection.

Temperature:

- Go to the line **"Temperature"** and press **OK**.
- Select with the arrow keys the required unit: °C or °F
- Press **OK** to validate the unit selection.

Airflow:

- Go to the line **"Airflow"** and press **OK**.
- Select with the arrow keys the required unit: m^3/h, L/s, cfm or m^3/s
- Press **OK** to validate the unit selection.

Air velocity:

- Go to the line **"Air velocity"** and press **OK**.
- Select with the arrow keys the required unit: m/s, fpm, km/h or mph.
- Press **OK** to validate the unit selection.

8.1.2 Integration

Pressure, airflow and air velocity:

- Go the line **"Integration"** and press **OK**.
- Select the integration coefficient between **0 and 9** with the arro keys.
- Press **OK** to validate.

Normative value : allows to calculate the instantaneous airflow in standardized temperature and atmospheric pressure conditions.

Airflow:

- Go to the line **"Normo values"** and press **OK.**
- Select **None**, **DIN1343** (temperature: 0 °C, Atmospheric pressure: 1013.25 hPa) or **ISO2533** (temperature: 15 °C, Atmospheric pressure: 1013.25 hPa) and press **OK.**

Temperature compensation : the air velocity and airflow measured with a Pitot tube or with Debimo blades (or other differential pressure element) depend on the operating temperature. It is necessary to enter the **operating temperature in** order to get significant results. It is possible to enter manually this temperature or to use a K thermocouple probe for an automatic temperature compensation.

Temperature:

- Go to the line **"Temp. Compens"** and press **OK**.
- Set with the arrow key the temperature compensation between -200 and 1300 °C
- Press OK to validate.

If no probe is connected, the temperature compensation will be 20 °C.

8.1.3 Atmospheric pressure

Air velocity:

- Go to the line **"Atmo. Press."** and press **OK**.
- Select the atmospheric pressure with the arrow keys between 800 and 1200 hPa.
- Press **OK** to validate.

8.2 Thermocouple module

8.2.1 Unit

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit: °C or °F
- Press OK to validate the unit selection.

8.2.2 Type

- Go to the line **"Type Tc"** and press **OK**.
- Select the type of thermocouple: K, T, J and S
- Press OK to validate.

8.2.3 Alarm

- Go to the line **"Temp.alarm"** and press **OK**.
- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.

8.3 Climatic conditions module

8.3.1 Unit

Temperature:

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit: °C or °F
- Press OK to validate the unit selection.

8.3.2 Alarm

Temperature:

- Go to the line **"Temp.alarm"** and press **OK**.

- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9°C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9°C then press **OK**.

8.4 U coefficient module

8.4.1 Unit

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit: °C or °F
- Press OK to validate the unit selection.

8.4.2 Alarm

- Go to the line **"Temp.alarm"** and press **OK**.
- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.

8.5 Vane probe and hotwire probe

8.5.1 Unit

Air velocity:

- Go to the line **"Air velocity"** and press **OK**.
- Select with the arrow keys the required unit: m/s, fpm, km/h or mph.
- Press **OK** to validate the unit selection.

Temperature:

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit: °C or °F
- Press OK to validate the unit selection.

Airflow:

- Go to the line **"Airflow"** and press **OK**.
- Select with the arrow keys the required unit : m^3/h, L/s, cfm or m^3/s
- Press **OK** to validate the unit selection.

8.5.2 Integration

Airflow and air velocity

- Go the line **"Integration"** and press **OK**.
- Select the integration coefficient between **0 and 9** with the arrow keys.
- Press **OK** to validate.

8.5.3 Alarm

Temperature:

- Go to the line **"Temp.alarm"** and press **OK**.
- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.

8.5.4 Normative value

Airflow

- Go to the line **"Normo Values"** and press **OK**.
- Select **None, DIN1343 or ISO2533** and press **OK**.

For a hotwire probe, it is possible to modify the atmospheric pressure.

8.5.5 Atmospheric pressure

- Go to the line **"Atmo. Press."** and press **OK**.
- Select the atmospheric pressure with the arrow keys between 800 and 1200 hPa.
- Press **OK** to validate.

8.6 Gas leak

8.6.1 Unit

- Go to the line **"CH4"** and press **OK**.
- Select the required unit : ppm, %vol, %LEL
- Press OK to validate the unit selection.

8.7 CO-CO_2/temperature/hygrometry probes

8.7.1 Unit

Temperature:

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit: °C or °F
- Press OK to validate the unit selection.

8.7.2 Alarm

CO and CO_2:

- Go to the line "**CO Alarm CO"** or **"CO2 Alarm"** and press **OK**.
- Select **"Alarm 1"** or **"Alarm 2"** pressing **OK.**
  It is possible to set the thresholds 1 and 2 of the alarms.
- Go to the line **"Threshold 1**" and press **OK**.
- Set the threshold with the arrow keys between 0 and 5000 ppm then press **OK**.
- Go to the line **"Threshold 2**" and press **OK**.
- Set the threshold with the arrow keys between 0 and 5000 ppm then press **OK**.

Temperature:

- Go to the line **"Temp. alarm"** and press **OK.**
- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.

- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.

8.7.3 Atmospheric pressure

For CO_2 / temperature / hygrometry probes it is also possible to modify the atmospheric pressure parameter.

- Go to the line **"Atmo. Press."** and press **OK**.
- Select the atmospheric pressure with the arrow keys between 800 and 1200 hPa.
- Press **OK** to validate.

8.8 Tachometry

8.8.1 Unit

- Go to the line "**Tachometry"** and press **OK**.
- Select the required unit : tr/min or RPM.
- Press OK to validate the unit selection.

8.8.2 Type

- Go to the line **"Tacho type"** and press OK**.**
- Select the required type : Optic or Contact
- Press OK to validate the type.

8.9 Multifunction and omnidirectional probes

8.9.1 Unit

Air velocity:

- Go to the line **"Air velocity"** and press **OK**.
- Select with the arrow keys the required unit : m/s, fpm, km/h or mph.
- Press **OK** to validate the unit selection.

Temperature:

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit: °C or °F
- Press OK to validate the unit selection.

Airflow:

- Go to the line **"Airflow"** and press **OK**.
- Select with the arrow keys the required unit: m^3/h, L/s, cfm or m^3/s
- Press **OK** to validate the unit selection.

8.9.2 Alarm

Temperature:

- Go to the line **"Temp. alarm"** and press **OK.**
- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9 °C then press **OK**.

8.9.3 Integration

Airflow and air velocity

- Go the line **"Integration"** and press **OK**.
- Select the integration coefficient between **0 and 9** with the arro keys.
- Press **OK to validate.**

8.9.4 Normative values

Airflow

- Go to the line **"Normo Values"** and press **OK**.
- Select **None, DIN1343 or ISO2533** and press **OK.**

For an omnidirectional probe, it is possible to modify the atmospheric pressure.

8.9.5 Atmospheric pressure

Airflow and air velocity

- Go to the line **"Atmo. Press."** and press **OK**.
- Select the atmospheric pressure with the arrow keys between 800 and 1200 hPa.
- Press **OK** to validate.

8.10 Hygrometry probe

8.10.1 Atmospheric pressure

Mixing ration / absolute humidity and enthalpy

- Go to the line **"Atmo. Press."** and press **OK**.
- Select the atmospheric pressure with the arrow keys between 800 and 1200 hPa.
- Press **OK** to validate.

8.10.2 Unit

Dew point / wet temperature and enthalpy :

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit : °C or °F
- Press **OK** to validate the unit selection.

8.11 Light probe

8.11.1 Unit

- Go to the line **"Light"** and press **OK.**
- Select the required unit : lx or fc
- Press **OK** to validate the unit selection.

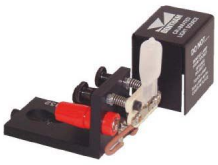
8.11.2 Information on light probe

Factor value according to the light sources

The following table indicates the factor value corresponding to different light sources with their examples.

The device is adjusted with an incandescent standard white light source owning its own spectral response.
The following lighting sources have a different spectral response. Therefore, the presented coefficients in the following table enable to correct the measurement according to these different sources.

The correction is carried out by multiplying the measured value by the F factor: Corrected value = F x measured value.

Sources	F Factor	Examples
Fluorescent tube with three bands	1.055	
High pressure mercury lamp	1.085	
Sodium vapour lamp	1.073	
Metal halide lamp with three additives	1.011	
Rare-earth metal halide lamp	0.947	
White led : neutral colour	0.950	
Halogen quartz lamp / tungsten (standard source)	1	

Order of magnitude of Lux according to applications

Here are a few examples of order of magnitude according to different current situations.

Environment	Lux
Outside with open air	500 to 25000
Outside with direct sunlight	50000 to 100000
Full moon night	1
Overnight lit street	20 to 70
Apartment well lit	200 to 400
Factory : electronic assembling	1500 to 3000
Hotel reception hall	200 to 500
Shop	750 to 1500
Hospital operating room	750 to 1500
Classroom	200 to 750

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Once returned, required waste collection will be assured in the respect of the environment in accordance to 2002/96/CE guidelines relating to WEEE.

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