



Air velocity Pressure Humidity Air flow Temperature

DIRECTIONS FOR USE

CLASS 200

New

SMART MULTI-FUNCTIONS DEVICES MP 200

CE



Pressure sensor
from 0 to 1000 mm H₂O



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TECHNICAL SPECIFICATIONS

The MP 200 is a micromanometer, compatible with all thermocouple K temperature probes. For more details, see the technical data sheet of the probes for portable instruments.

	Units of measure	Measuring ranges	Accuracies*	Resolutions
Pressure	mmH ₂ O, mbar, kPa, Pa, in Wg, mmHG	0 to ±1000mmH ₂ O	±0,5% of reading ±1mmH ₂ O	0,1mmH ₂ O
Velocity with Pitot	m/s, fpm	4 to 30m/s 31 to 100m/s	±3% of reading ±0,1m/s ±3% of reading ±0,3m/s	0,1m/s 0,1m/s
Velocity Debimo	m/s, fpm	4 to 30m/s 31 to 100m/s	±3% of reading ±0,1m/s ±3% of reading ±0,3m/s	0,1m/s 0,1m/s
Airflow with Pitot	m ³ /h, cfm, l/s, m ³ /h	0 to 65000m ³ /h	±3% of reading ±10m ³ /h	1m ³ /h
Airflow Debimo	m ³ /h, cfm, l/s, m ³ /h	0 to 65000m ³ /h	±3% of reading ±10m ³ /h	1m ³ /h
Thermocouple K 	°C, °F, K	-200 to -40°C -39 to +999°C +1000 to +1300°C	±1% of reading ±1,2°C ±0,5% of reading ±0,8°C ±1% of reading ±1,2°C	0,1°C 0,1°C 1°C

* Performed in laboratories conditions, accuracies mentioned in this document will be guaranteed, subject to the same conditions or to a calibration balancing.

DISPLAY :

Graphic, with automatic backlighting. Size 48 x 24 mm.

HOUSING :

Shock-proof, made of ABS/PC, with Elastomer edges.

KEYPAD :

Made of Elastomer : 4 keys and one control knob.

CONNECTIONS :

Pressure connectors : Ø 5,2 mm, made of nickelled brass

Thermocouple K connectors : compensated miniature plugs

Numeric connection output : USB.

COMMUNICATION MODE :

RS 232.

MEASURING ELEMENTS :

Pressure : piezo-resistive sensor (linearity : 0,25%FS, response time : 500 µs, stability (long term) : 0,25%FS)

Overpressure allowed : 700 mbar

Thermocouple temperature : Thermocouple K class 1

CONFORMITY :

Electromagnetical compatibility (norm NF EN 61326-1)

POWER SUPPLY :

4 Alcaline batteries 1,5 V LR6

WORKING ENVIRONMENT :

Neutral gas

WORKING TEMPERATURE :

From 0 to 50°C.

STORAGE TEMPERATURE :

From 0 to 50°C.

DIMENSIONS :

176 x 78 x 35 mm

WEIGHT :

400 g

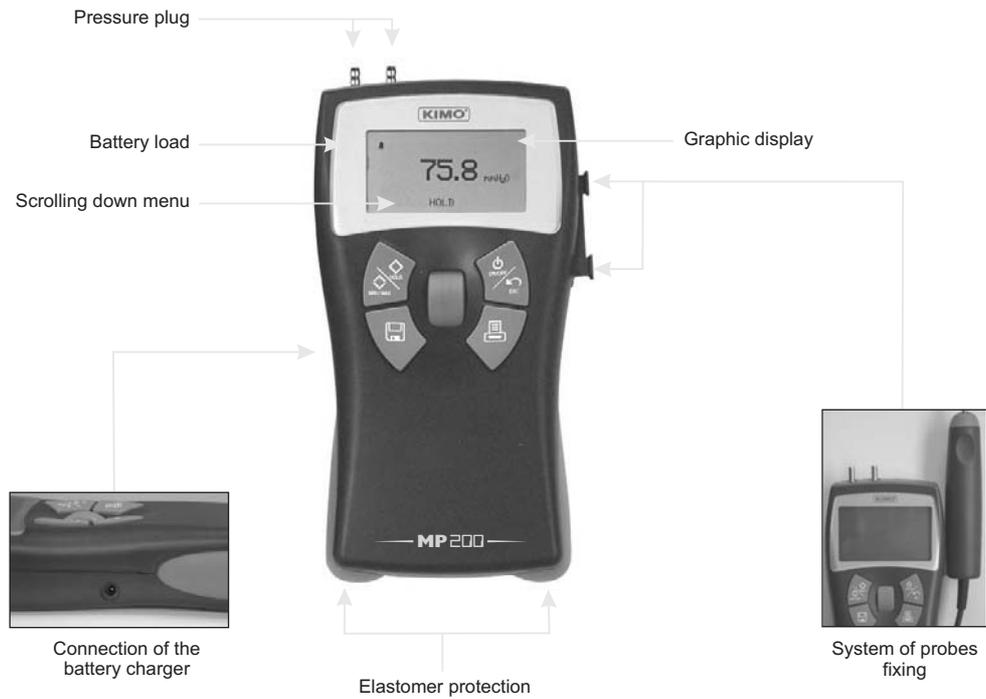
LANGUAGES AVAILABLE :

French, English, Spanish, Portuguese, Italian, German, Dutch.

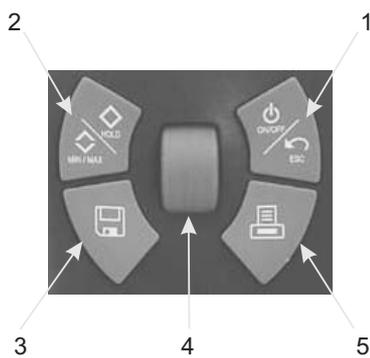


PRESENTATION

Description :

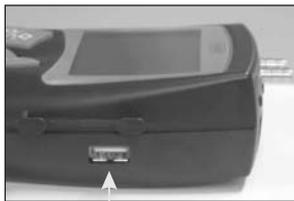
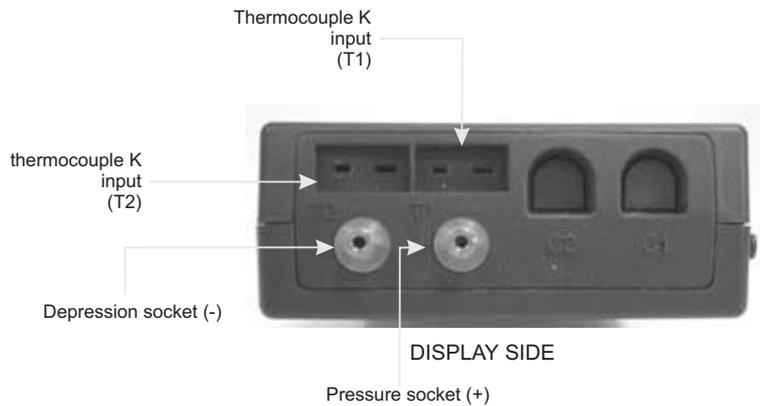


Keyboard :



1. ON/OFF : Switch on / switch off the instrument.
ESC : Return to the previous page or on the last validated data.
2. Press 1 time : HOLD function, freeze the current measure.
Press 2 times : show the values minimum and maximum measured.
Press 3 times : return to the current menu measure.
3. Recording : allow to memorize data.
4. Press on the control knob to validate.
Browse the menu by scrolling down the knob.
5. Print out of data on a printer.

○ **Connections :**



USB port for connection to the printer and joining to a PC

- **T1 and T2** : Connection of thermocouple K probes
- **Pressure and depression sockets** : Connection of silicone tubes for measure of pressure or air velocity / air flow with Pitot tube.

INTRODUCTION OF THE MENU ○

To switch on the instrument, press the key "ON/OFF".
The screen shows the name of the device, its serial number, its calibration date, the date and hour (see photo below).



To access to the menu pressure, press on the knob ; To access to another menu, connect the corresponding probe. If this one uses the SMART PRO system, the screen shows the type of the connected probe, and its calibration or adjusting date. To access to the menu press on the knob. To return to the homepage, disconnect the probe or press on "ESC" for the menu pressure.

To switch off the instrument, press some seconds on the "ON/OFF" key.

PRESSURE MENU

When you access to the menu pressure, you can read at the center of the screen the measured value. The last line of the screen shows the next menu (browsing the menu by scrolling down the knob) :

- Autozero
- Units
- Integration
- Point by point average
- Automatic point by point average
- Automatic average
- Air velocity with Pitot
- Air velocity with Debimo
- Air flow with Pitot (rectangular, circular)
- Air flow with Debimo (rectangular, circular)
- Air flow with K Factor

To validate a function, press on the knob when the wished function is shown on the screen.

- **Autozero :**
To realize a manual autozero, press on the knob when the scrolling down menu displays "autozero".
- **Units :**
See p. 5
- **Integration :**
The coefficient of integration allows to smooth the measure, to avoid the inconvenient variations. To enter a coefficient, use the knob to make scroll down figures from 0 to 9 and validate by pressing on the knob.
Coefficient 0: no integration, important fluctuation in the shown measure.
Coefficient 9: maximal integration, more stable reading (recommended coefficient of integration).
- **Point / point average :**
See p. 6
- **Automatic point / point average :**
See p. 6
- **Automatic average :**
See p. 5
- **Air velocity with Pitot :**
See p. 7
- **Air velocity with Debimo :**
See p. 7
- **Air flow with Pitot :**
See p. 6
- **Air flow with Debimo :**
See p. 6
- **Air flow with K Factor :**
See p. 7

TEMPERATURE MENU

When you connect your probe(s) (see connections p. 3), the screen shows its characteristics. It is possible to connect 2 probes thermocouple K at the same time. Press then on the knob to enter in the menu temperature, the measured value is shown in the screen and the following menu appears on the last line (by browsing the menu by scrolling down the knob):

- Units
- Delta T (only if 2 probes thermocouple K are connected)

To validate a function, press on the knob when the wished function is shown on the screen.

- **Units :**

See p. 5

- **Delta T :**

See p. 5

SUB-MENUS

- **Units :**

Browse the different available units by scrolling down the knob and validate pressing on the knob. When you have the choice between various parameters (velocity and temperature, for example), you have to validate each unit of measure.

- **Delta T :**

When 2 thermocouple K probes are connected, you have the possibility of calculate the Delta T which corresponds to the difference between the temperature measured by T1 and T2. To come out of this function, press the touch "ESC".

- **Automatic average :**

This function allows to calculate the average value that the device measured in an interval of chosen time. When "Departure" appears on the screen, press on the knob to start the calculation. The screen registers the sold time. To stop and reach the result, press again on the knob. The results are registered on the screen: average (s), minimum value (s), maximum value (s), standard deviation(s) as well as the duration of the calculation. Press on "ESC" to return to the previous page (by pressing on the knob, you begin a new calculation).

● **Point / point average :**

This function allows to calculate the average value of various points which you will have validated. The scrolling down menu allows to validate a point or to reach the average of points previously validated. To validate a point, press on the knob. Validate as many points as necessary, then by means of the knob, choose "Average" and validate. The screen shows then: average(s), count of validated points, minimum value(s), maximum value(s) and standard deviation(s). To show the values of the various points, press on the knob. Press then on " ESC ": once to return to the previous display, twice to begin another calculation and three times to go out of the menu "point / point average".

● **Automatic point / point average :**

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

It is necessary to choose at first the duration on which will be calculated each of the points; browse the figures by scrolling down the knob and validate every number by pressing on the knob. Once the duration validated, the scrolling down menu gives you access to the validation of points and to the average. Proceed then in the same way as for the calculation of "average point / point" (previous paragraph).

● **Airflow with Pitot (see connection of the Pitot tube p.7) :**

When you enter in this menu, it is necessary to begin by selecting the type of diffuser : rectangular or circular by scrolling down the knob

- **Rectangular** : browse then the units of measurement by scrolling down the knob and validate. Enter the length of the diffuser. Browse each figure by scrolling down the knob and validate pressing on the knob (to return to the previous figure, press on "ESC"). Proceed in the same way for the width.

You have access to a new scrolling down menu :

- Autozero (see p. 4)
- Units (see p. 5)
- Point/point average (see p. 6)
- Automatic point/point average (see p. 6)
- Temperature equalization (see p. 7)

- **Circular** : browse then the units of measurement by scrolling down the knob and validate. Enter the diameter of the diffuser. Browse each figures by scrolling down the knob and validate pressing on the knob. You have access to a new scrolling down menu :

- Autozero (see p. 4)
- Units (see p. 5)
- Point/point average (see p. 6)
- Automatic point/point average (see p. 5)
- Temperature equalization (see p. 7)

● **Airflow with Debimo :**

The principle is the same that the sub-menu "Airflow with Pitot" : Select the type of diffuser, the length and the width or the diameter. The screen shows the following scrolling down menu :

- Autozero (see p. 4)
- Units (see p. 5)
- Automatic average (see p. 5)
- Temperature equalization (see p. 7)



● **Air flow with K Factor :**

The K Factor is a coefficient making possible to calculate a flow from a Delta P. This coefficient is given by the manufacturer of supplying diffusers equipped with pressure connections (+ and -). The K Factor is stated in the technical datasheet from the manufacturer. From the square root of the measured pressure (Delta P) and from the K factor, you get the airflow :

$$\text{Flow} = \sqrt{\Delta P} \times K_f$$

The window "K Factor flow" appears. During the first use, it displays a zero value of the coefficient (0,00). To modify the value of the K Factor, press the control knob. You can "Confirm" or "Modify" your choice. Select "Modify", then validate. Then enter the value of the coefficient using the control knob, and validate again (possibility to indicate up to 10 different values). Then select the unities of flow (m³/s, m³/h, L/s, cfm) and of pressure (mmH2O, inWG, kPa, mmHG, mbar, Pa). Validate. The screen displays the value of the measured flow, the Delta P and the K Factor.

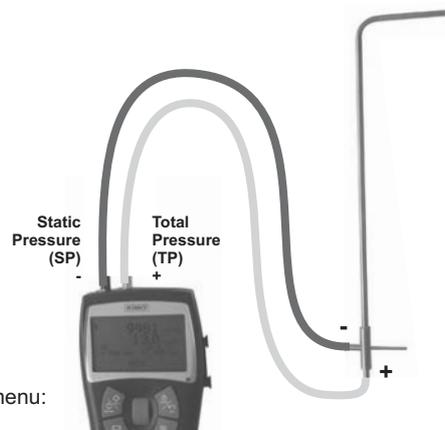
● **Velocity with Pitot :**

Connect the Pitot tube (See plan opposite).

At the bottom of the screen appears the following submenu:

- Autozero (see p. 4)
- Temperature equalization (see p. 7)
- Automatic point / point average (see p. 6)
- Point / point average (see p. 6)
- Units (see p. 5)

$$\text{Dynamic pressure} = TP - SP$$



● **Velocity with Debimo :**

At the bottom of the screen appears the following submenu:

- Autozero (see p. 4)
- Units (see p. 5)
- Automatic average (see p. 5)
- Temperature equalization (see p. 7)

● **Temperature equalization :**

It is possible to modify the value of the compensation in temperature. Indeed, the velocity and the airflow with Pitot's tube and with Debimo blades are calculated from a temperature of use in +20°C. It is thus necessary to enter the real temperature of use to obtain more precise results.

When you are in the menu 'Temperature equalization', modify the symbol (+ o -) by the means of the knob and validate pressing on the knob. You have to process in the same way to validate each of the 4 figures of the temperature.

SETTINGS

To reach the various settings, switch on the device (do not connect a probe). Press then on "ON / OFF".

The following scrolling down menu appears :

- Date and hour
- Retro-lighting
- Contrast
- Keys Beep
- Languages
- Automatic stop
- Solenoid valve

To validate a function, press on the knob when the wished function is shown on the screen.



- **Date and hour :**
Use the knob to settle each figures of the date and of the hour, and validate at each time pressing on the knob. To return to a figure previously validated, press on "ESC".
- **Retro-lighting :**
It is possible to activate or to deactivate the retro-lighting of the display : by means of the knob choose "ON", "OFF" or "automatic" and press to validate. To go out of this menu, press on "ESC".
- **Contrast :**
By the means of the knob, adjust the contrast of the screen from 0 to 7 and validate by pressing on the knob.
- **Keys beep :**
It is possible to activate or to deactivate the tone of keys. Validate the chosen option by pressing on the knob.
- **Languages :**
By the means of the knob, browse the different available languages and validate pressing on the knob.
- **Automatic stop :**
It is possible to cancel the automatic stop of the device or to settle it. For that purpose, use the scrolling down knob and choose "OFF" to cancel the automatic stop or choose a value (by slice of 15 minutes).
When you restore data on PC, the automatic stop does not work, but at the end of the load, the device goes out automatically.
- **Solenoid valve :**
You can activate or deactivate the solenoid valve, that is make an autozero. **It is nevertheless strongly recommended to leave it active.**

DATA RECORDING, PRINTING AND DELETING

Before enter in the menu "recording", it is necessary to connect the probes that will be used. Enter in the menu which you wish to record. Press the key "Recording" (see p. 3) to reach the menu "Datalogger". At the bottom of the screen appears the following scrolling down menu:

- New
- Print.
- Delete

It is thus possible to print data, to record or to delete them.

● **New :**

This function allows to register a new campaign of measures. It is necessary to enter first of all the name of the file (12 characters at most). Browse the letters by scrolling down the knob and validate every character by pressing on the knob or by choosing the symbol ◀ if you enter less than 12 characters. Choose then if you wish a manual or automatic recording of the data (by means of the knob).

- **Manual recording :** validate as many points as you wish by pressing on the knob (the number of registered points is indicated on the last line). Press on the key "Recording" to stop the recording. If you really wish to stop, choose "Yes" and to continue to register points, click on "No" (by means of the knob).

- **Automatic recording:** By means of the knob, choose the interval of time between the recording of each of the points (the minimum is of 5 seconds). Choose then the duration on which points are going to be registered (validate the number of days, hours and minutes) then validate. The recapitulative appears on the screen. To begin the recording, press twice on the knob. Once the ended recording, the device switches of. To stop the current recording, press on "Recording". If you really wish to stop, choose "Yes" and to continue the recording, click on "No" (by means of the knob).

To restore the data registered on a PC, switch on the device (without any probe) and connect the cordon on the port USB (see p. 3). **During the recordings, the automatic stop of the device does not work, but at the end of the procedure, it will switch off automatically.**

● **Print :**

When "Print" is validated, by means of the knob, choose the campaign which you wish to print and validate by pressing on the knob. Go out of the menu "printing" by pressing on "ESC".

● **Delete :**

This function allows to delete the campaigns of measure stored in the device. To enter in the menu "delete", validate by pressing on the knob. Then, always by means of the knob, choose to cancel or to confirm the demand.

GUARANTEE

KIMO provides a one-year guarantee, starting from the date on which the appliance was originally purchased, that any new appliance will be free of any manufacturing or structural defects. This guarantee does not cover defects resulting from incorrect handling or from any repairs which may be made by persons other than the manufacturer.

Any defects covered by this guarantee will be repaired free of charge. An estimate will be provided for any damage not covered by this guarantee. The customer's prior approval will be requested before any repairs are done.

KIMO will see to the replacement of any constituent parts of this appliance.

Any appliance, whether under guarantee or not, must be returned carriage paid. A letter detailing the faults defected should be sent with the appliance whenever possible.

CALIBRATION

All KIMO devices are calibrated in our premises and supplied with a calibration certificate, as per the AFNOR FD X 07-012 norms, in accordance with the National Standards.

In order to comply with standards of Quality Assurance, measuring devices should be checked annually.



Ref. NT Ang - MP 200 - 10/02 C

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