Configuration of CA 310 transmitters by keypad

Table of contents

1.1. Description of the transmitter

CA310 transmitter can be configured via the keypad. It is possible to set the measurement units, to activate or not a channel...

Principle : the different settings are in the form of folders and sub-folders numbers. The digital codes are fully detailed in this manual.

Channel 1 indicator light

Channel 2 indicator light

Channel 3 indicator light

Main screen

+ key

- key

OK key

Esc key

Alarm 1 indicator light

Alarm 2 indicator light

Alarm 3 indicator light
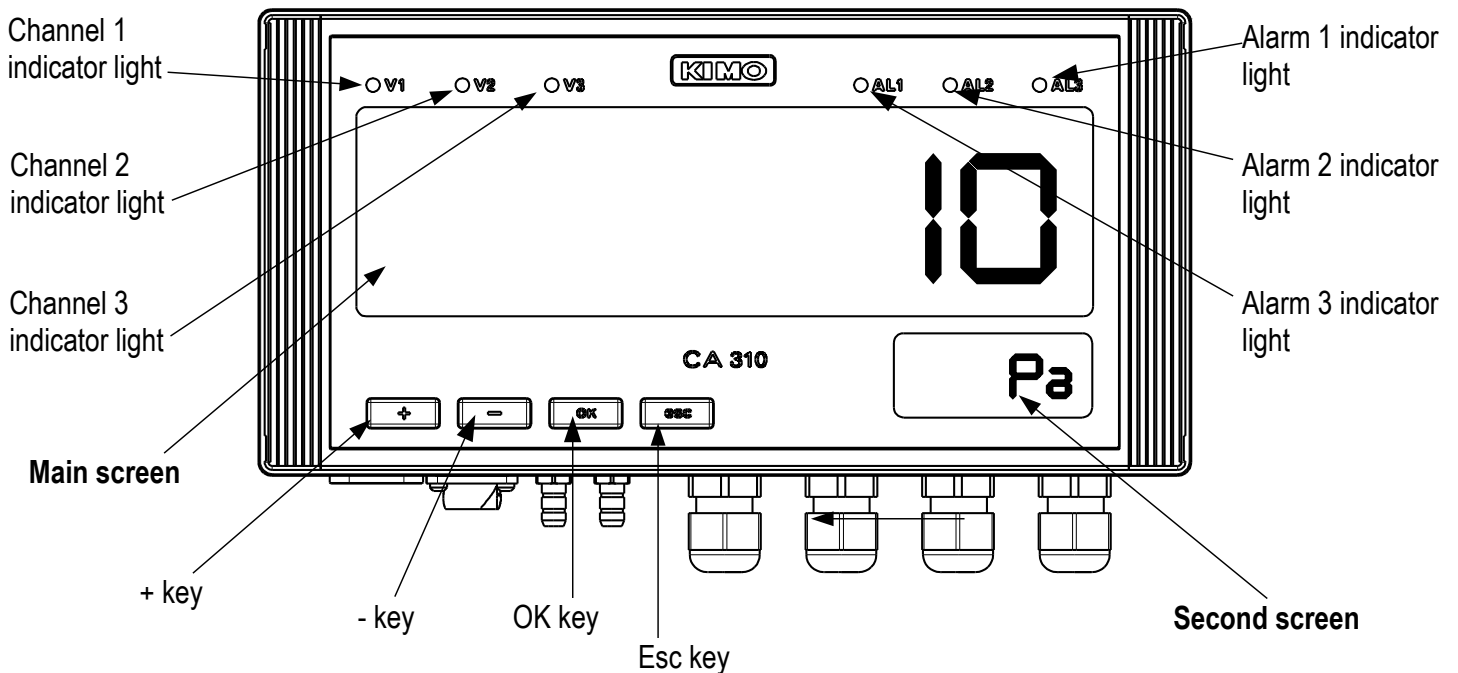
Second screen

Main screen displays the measured values and the folders numbers.
Second screen displays the measurement units and the sub-folders numbers.

1.2. Description of the keys

– **+ key :** increments a value or a level
– **- key :** decrements a value or a level
– **OK key :** validates an input
– **Esc key :** cancels an input or goes back to previous step

1.3. Protection tips of the sensor

It's extremely unwise to remove the protection tip of our hygrometry probes as the sensitive element is very fragile even to light contacts. However, if you have to remove the protection tip, take all possible precautions and avoid any contact with the sensitive element.
To remove the protection tip, unscrew it or unclip it.

Protection tip to unscrew

Sensitive element

Protection tip to unscrew

Sensitive element
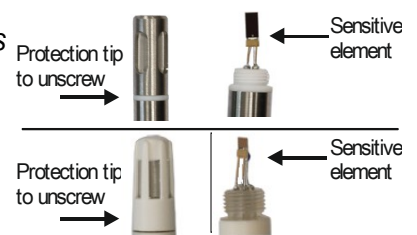
2. Access to the different functions

⚠️ **This step is compulsory for each configuration.**

First, to access to the transmitter functions, and for safety, a safety code must be entered. The default safety code is **0101**.

- The transmitter must be energized.

➢ Connect the transmitter.
➢ Wait until the initializing period is over. Wait until the initializing period is over.
➢ Press **OK.**
   The main screen displays **"0000"** *and the second screen displays* **"Code"**. *The 1st zero blinks.*
➢ Press OK to go to the 2nd zero.
   It blinks.
➢ Press + key to display 1 then press OK.
   The 3rd zero blinks.
➢ Press OK to go to the 4th zero.
➢ Press + key then press OK.
   The following display appears :

```
 0101
 CODE
```

```
 F  100
```
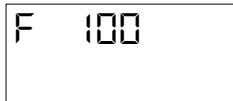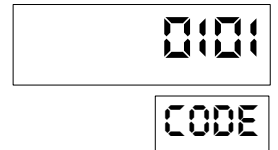
"F 100" is for the number of the configuration folder. There are 6 :
- **F 100 :** folder of the transmitter configuration. See page 7.
- **F 200 :** folder of the channels and measurement units. See page 10.
- **F 300 :** folder of the analogue outputs. See page 12.
- **F 400 :** folder of the alarms. See page 17.
- **F 500 :** folder of the channels, integration and autozero configuration. See page 19.
- **F 600 :** folder of the probes and boards configuration, See page 22.

To select the required folder :
   "F 100" is displayed and 1 is blinking.
➢ Press + key until the required folder number is displayed (F 100, F 200, F 300, F 400, F 500 or F 600).
➢ Press OK.

3. F 100 : Configure the transmitter

This folder allows to configure the following parameters of the transmitter : safety code, modbus, options and factory configuration.
It also indicates the serial number and the firmware version of the transmitter.

3.1.   Access to the serial number : F100

The serial number allows to get activation codes for the options.

F 100 is displayed (see previous page).
➢ Press OK.
"F 100" is displayed on the second screen and the serial number scrolls on the main screen.

3.2.   Access to the firmware version : F101

F100 folder is displayed
➢ Press + key.
"F 101" is displayed on the second screen and the firmware version is displayed on the main screen (e.g : 1.01)

3.3.   Lock the keypad : F 140

For more safety and to avoid any handling mistake, it is possible to lock the keys.

F101 sub-folder is displayed.
➢ Press + key.
"F 140" is displayed on the second screen and "0" is displayed on the main screen meaning the locking is off.
➢ Press OK.
"0" blinks.
➢ Press + or - key, "1" blinks, then press OK.
"LOCK" is displayed for a few seconds then the transmitter backs to the displaying of measured values.
All the keys are inactive.
To activate them again :
➢ Press OK for 10 seconds.
"LOCK" is displayed for a few seconds then the transmitter goes back to the displaying of measured values and keys are active again.

3.4.   Modify the safety code : F141

It is possible to modify the safety code.

F140 sub-folder is displayed.
➢ Press + key.
"F 141" blinks and the safety code is displayed on the main screen.
➢ Press OK.
The 1st zero blinks.
➢ Press + or – key to modify the digit then press OK.
The 2nd digit blinks.
➢ Press + or – key to modify the digit then press OK.
The 3rd digit blinks.
➢ Press + or – key to modify the digit then press OK.
The 4th digit blinks.
➢ Press + or – key to modify the digit then press OK.
"OK"» is displayed on the main screen.
➢ Press OK to validate the modification of the code or Esc to cancel.
The transmitter goes back to the displaying of the F141 folder with the new code indicated.

3.5. Configure the Modbus communication (optional)

Modbus option must be activated (see chapter 3.6).

3.5.1 Set the slave number : F150

F141 sub-folder is displayed.
➢ Press + key.
"F 150" is displayed on the main screen.
➢ Press OK.
"F150" blinks on the second screen and the slave number is displayed on the main screen (ex : 255).
➢ Press OK.
The 1st digit of the slave number blinks.
➢ Press + or - keys to modify it then press OK.
The 2nd digit of the slave number blinks.
➢ Press + or - keys to modify it then press OK.
The 3rd digit of the slave number blinks.
➢ Press + or - keys to modify it then press OK.
"F150" blinks and the selected slave number is displayed on the main screen.

3.5.2 Set the speed communication : F151

➢ Press + or – key to go to F151 sub-folder.
Speed communication in bits per second is displayed (e.g : 9600).
➢ Press OK.
The speed communication blinks.
➢ Press + or – key to select the required speed communication between the following values :
- 2400 bds
- 4800 bds
- 9600 bds
- 19.2 Kbds
- 38.4 Kbds
- 115.2 Kbds
➢ Press OK.
"F151" blinks and the selected speed communication is displayed on the main screen.

If the Modbus option is selected when ordered the transmitter, the default slave number will be indicated on serial number label and the default speed is 19 200 bds.

3.6. Activate the options

To activate an option, an activation code is necessary. This code is provided by the manufacturer. Options concerned by the activations codes are the high resolution in pressure (sub-folder F170), the modbus (sub-folder F171) and air velocity and airflow (sub-folder F172).
Ethernet option is factory built.

- High resolution in pressure option : F170
"F150" sub-folder is displayed.
➢ Press + key.
"F170" blinks on the second screen and "0" is displayed on the main screen, meaning the option is not activated.
➢ Press OK.
"0" blinks.
➢ Press + key.

The transmitter asks for an activation code.

➢ Enter the activation code (same procedure as for the safety code) then press OK.
"F170" blinks and "1" is displayed on the main screen, meaning the option is activated.

- Modbus option : F171

➢ Go to the F171 sub-folder and perform the same procedure as for high resolution option.

- Air velocity and air flow option : F172 (this option is only available with a pressure board type SPI-2)

➢ Go to the F172 sub-folder and perform the same procedure as for high resolution option.

- Ethernet option : F173

➢ Ethernet option can not be activated after the manufacturing of the product. This option must be asked when ordered the transmitter.

3.7. Activate the digital inputs : F180

"F170" folder is displayed on the main screen.

➢ Press + key.
"F180" blinks on the second screen and "OFF" is displayed on the main screen, meaning the digital inputs are not activated.

➢ Press OK.
"OFF" blinks.

➢ Press + key.
"ON " blinks on the main screen.

➢ Press OK.

"ON" : displaying of values transmitted by Modbus or Ethernet is activated
"OFF" : displaying of values transmitted by probes and boards is activated.

3.8. Back to factory settings : F190

"F180" sub-folder is displayed.

➢ Press + key to display F190 folder.
"F190" blinks on the second screen and "RAZ" is displayed on the main screen.

➢ Press OK.
"OK?" is displayed.

➢ Press OK to confirm the factory settings or Esc to cancel.

All the performed configurations will be erased.

4. F 200 : Configuration of the channels and measurement units

This folder allows to activate the channels and to set measurement unit for each channel.

4.1. Activate a channel

The transmitter is powered on.
➢ Press OK.
➢ Enter the activation code (see page 6).
➢ Press OK.
➢ Press + key to go to F200 folder.
➢ Press twice OK.
   ***"MOD", "OFF" or "SDE"** is displayed on the main screen.*
➢ Press OK.
   ***"MOD", "OFF" or "SDE"** blinks.*
➢ Press + and – keys to select :
   • **« SDE » :** channel is activated with a measurement probe
   • **« PRES » :** channel is activated with a pressure board
   • **« OFF » :** channel is deactivated
➢ Press OK.
   The last zero of F200 blinks.

"F200" folder allows to activate the channel 1 of the transmitter.
To activate channels 2 and 3 go to the following folders :
   • F210 for channel 2
   • F220 for channel 3
➢ Perform the same procedure as for the channel 1.

4.2. Assign a measurement unit to a channel

The transmitter is powered on and a channel is activated.
"F200" folder is displayed on the second screen and the last zero blinks.
➢ Press + key.
➢ Press OK.
   "F201" sub-folder is displayed on the second screen with the unit corresponding to the channel 1 on the main screen.
➢ Press OK.
➢ Press + and – keys to select the required unit.
➢ Press OK.

"---" sign means that the channel is deactivated.

"F201" sub-folder allows to select the unit for the channel 1.
To select the unit for channels 2 and 3, go to the following folders :
   • F211 for channel 2
   • F221 for channel 3
➢ Perform the same procedure as for the unit selection for the channel 1.

If a current/voltage board is connected to the transmitter, it is possible to create a **free unit**.
Always on F 201 sub-folder :
➢ Scroll the units until **"UNITE LIBRE" (free unit)** is displayed on the main screen.

> ➢ Press OK.
> *The up segment of the 1ˢᵗ digit blinks.*
> ➢ Press OK to validate the segment or + and – keys to not taking it into account and go to the following digit.
> ➢ Press + and – keys to go to the 1ˢᵗ segment of the following digit once the 1ˢᵗ digit is configured.

The new measurement unit can have a maximum of 4 typefaces.

Order of turn of the digits segments :
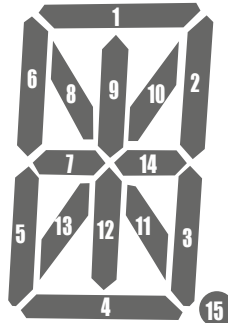
List of available units :

1	°C	18	ppm
2	°F	19	km/h
3	%RH	20	m^3/h
4	kJ/kg	21	l/s
5	°C td	22	cfm
6	°F td	23	m^3/s
7	°C tw	24	lux
8	°F tw	25	fc
9	kPa	26	W/m^2
10	inWg	27	mV
11	hPa	28	V
12	mbar	29	µA
13	mmHg	30	mA
14	mmH$_2$	31	A
15	daPa	32	ohms
16	Pa	33	UNITE LIBRE (free unit)
17	m/s		

5. F 300 : Manage analogue inputs and outputs

CA310 transmitters have 3 analogue outputs, 2 digital inputs/outputs as option and 3 analogue inputs as option with the MVA board.

> ⚠️ **With MVA board : analogue inputs are activated and analogue outputs are deactivated, so this is the inputs that have to be configured.**
> **Without MVA board : analogue outputs are activated and analogue inputs are deactivated, so this is the outputs that have to be configured.**

So 5 types of configuration are possible :

1 – Displaying of values from a measurement device via analogue inputs

> ➢ Disable the digital inputs : **"F180" on "OFF".**
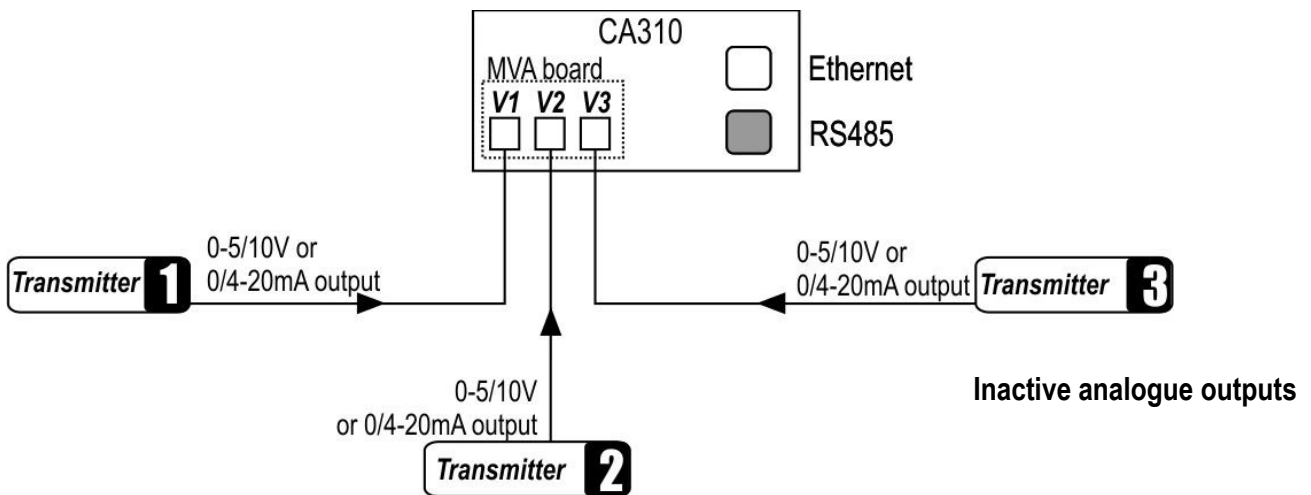
2 – Displaying of values from a measurement device via digital inputs

> ➢ Enable the digital inputs : **"F180" on "ON"**
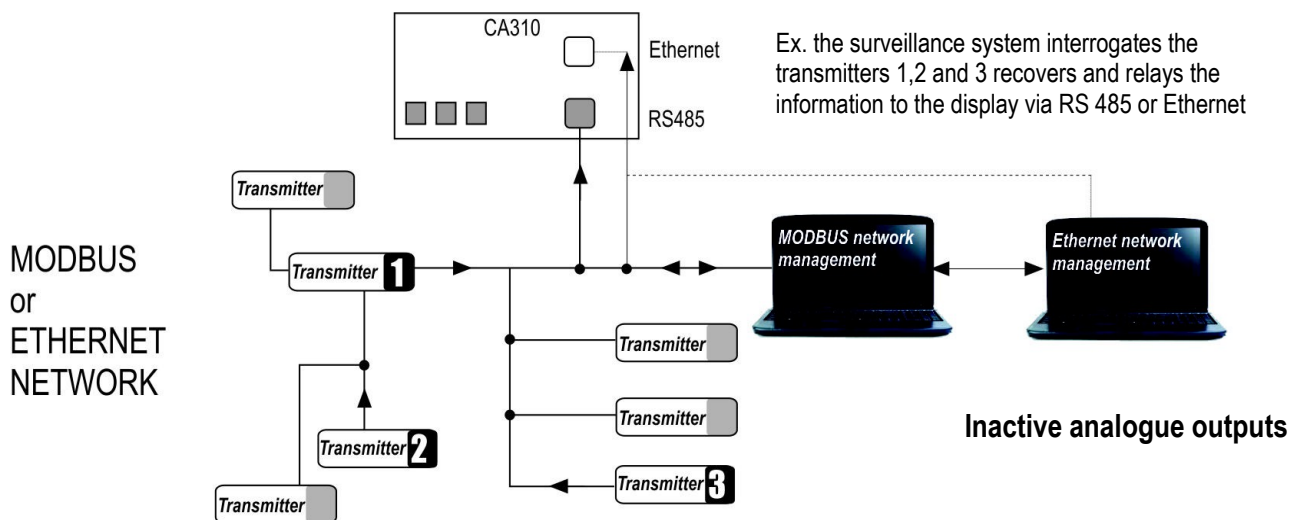
3 – Displaying of measured values via pressure boards or probes via the analogue outputs

➢ Disable the digital inputs : **"F180" on " OFF"**
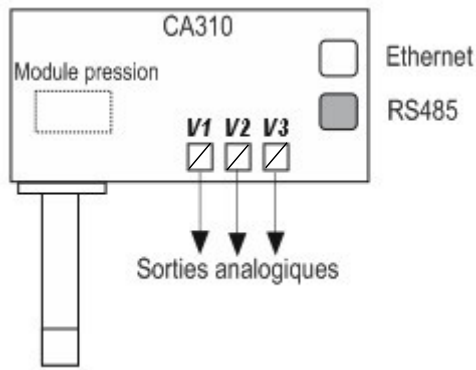
Active analogue outputs

4 – Displaying of measured values via pressure boards or probes and transmission of the value via digital outputs, Ethernet or Modbus

➢ Disable the digital inputs : **"F180" on "OFF"**

Active analogue outputs
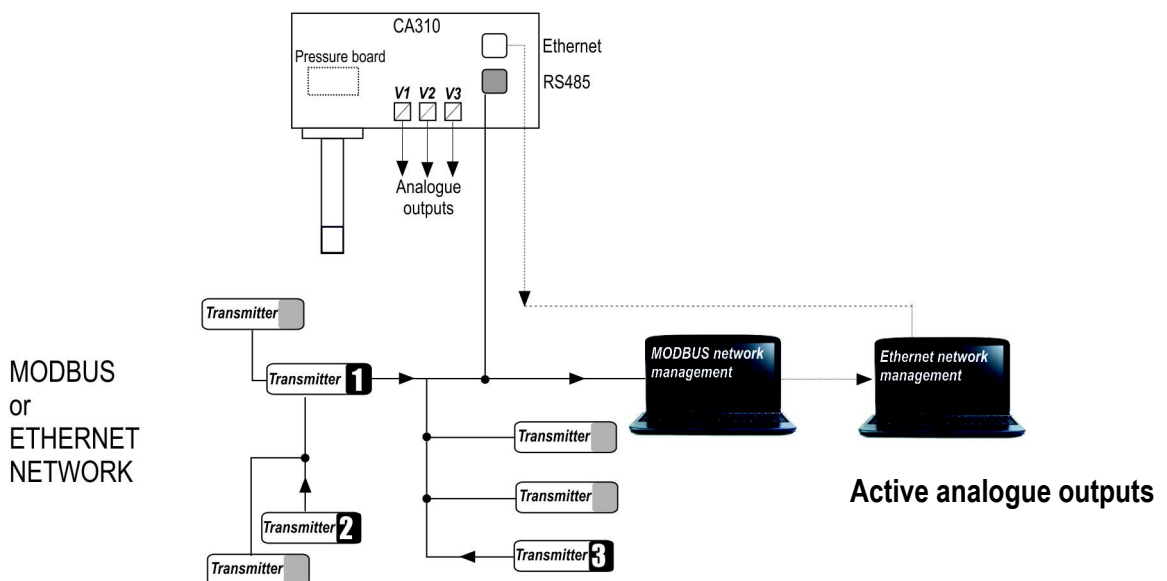
5 – Displaying of the measured value via a probe and via the analogue outputs and transmission of values via analogue outputs

➢ Disable the digital inputs : **"F180" on "OFF"**
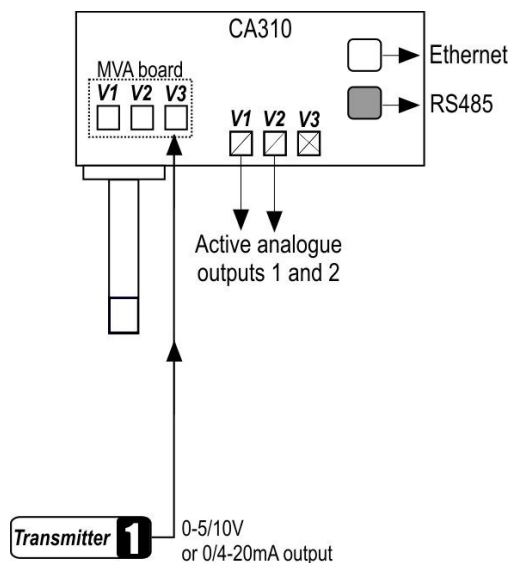
When a channel of the MVA board is enabled, the corresponding channel in output est disabled (e.g : channel n°3 of the MVA board enabled, channel n°3 in output disabled).

5.1. Set the analogue inputs and outputs

> *The transmitter is powered on.*
- ➢ Press OK.
- ➢ Enter the safety code (see page 6).
- ➢ Press OK.
- ➢ Press + key to go to F300 folder corresponding to the analogue output of the channel 1 then press twice OK.
  "F300" is displayed on the second screen and the analogue output of the channel 1 is displayed on the main screen.
- ➢ Press OK.
  The analogue output blinks.
- ➢ Press + or – key to select the required output signal.
  - • 4-20 mA
  - • 0-20 mA
  - • 0-10 V
  - • 0-5 V
- ➢ Press OK.

ⓘ **"F300"** folder is for the analogue output of the channel 1.
For the channels 2 and 3, go to the following folders :
- • F310 for the channel 2
- • F320 for the channel 3
- • Perform the same procedure as for the channel 1.

5.2. Set the ranges of the analogue inputs and outputs

This function allows to modify the ranges of the of the analogue outputs.

⚠️ **Values to enter depend on the unit of measurement and not on the measurement range of the transmitter.**

Ex : on a CA310 pressure transmitter (0 to ±100 Pa) with a reading in mmH_2O, the minimum and maximum ranges must be configured on a measuring range from 0 to ±10 mmH_2O. See conversion chart page 16).

> *The transmitter is powered on.*
- ➢ Press OK.
- ➢ Enter the activation code (see page 6).
- ➢ Press OK.
- ➢ Press + key to go to F300 folder.
- ➢ Press OK twice.
  "F300" blinks on the second screen.
- ➢ Press + key then OK to enter in the folder F301 corresponding to the low range of the channel 1..
- ➢ Enter with + and – keys the figure value or the negative sign of the value then press OK.
  The 2nd digit blinks.
- ➢ Enter with + and – keys its value then press OK.
- ➢ Perform the same procedure for the following figures.
- ➢ Press OK when the last figure is configured.
  F 301 blinks, the low range is configured.

- ➢ Press + key then press OK to enter in the folder F 302 corresponding to the high range of the channel 1.
  The 1st digit of the high range blinks.
- ➢ Enter with + and – keys the figure value or the negative sign of the value then press OK.
  The 2nd digit blinks.
- ➢ Enter its value with + and – keys then press OK.

➢ Perform the same procedure for the following figures.
➢ Press OK when the last figure is configured.
F 302 blinks, the high range is configured.

ℹ️ To set the low and high ranges of the channel 2, go to the folder F311 (low range) and F 312 (high range) and follow the setting procedure of the channel 1.

ℹ️ To set the low and high ranges of the channel 3, go to the folder F 321 (low range) and F 322 (high range) and follow the setting procedure of the channel 1.

5.3. *Output diagnostic*

This function allows to check on a measurement device (multimeter, regulator or automate) the proper functioning of the outputs. The transmitter will generate a voltage (between 0 and 10 V) or a current (between 0 and 20 mA) according to the setting of the type of output.

- For a 0-10 V output signal, the transmitter will generate 0 – 5 or 10 V.
- For a 0-5 V output signal, the transmitter will generate 0 – 2.5 or 5 V.
- For a 4-20 mA output signal, the transmitter will generate 4 – 12 or 20 mA.
- For a 0-20 mA output signal, the transmitter will generate 0 – 10 or 20 mA.

5.3.1 Connection configuration

Before carrying out the output diagnostics, all connections and configurations of the transmitter must be enabled, to avoid any damage on the transmitter and the multimeter !

➢ Select an output for the output diagnostic.
➢ Connect a measurement device on the channel 1, 2 or 3.

5.3.2 Perform the output diagnostic

Once the connection to the measurement device is performed, you can carry out the analogue output diagnostics on several check points.

The transmitter is powered on.
➢ Press OK.
➢ Enter the activation code (see page 6).
➢ Press OK.
➢ Press + key to to go F303 folder.
➢ Press OK.
*F 303 blinks, corresponding to the folder of the **channel 1 diagnostic.***
➢ Press OK.
➢ Press + and – keys to select the signal the transmitter must generate.

Display	Generated output	Example
1/3	Simulates 0 % of the output range	On the range 0-10V, the transmitter will generate 0 V.
2/3	Simulates 50 % of the output range	On the range 0-10V, the transmitter will generate 5 V.
3/3	Simulates 100 % of the output range	On the range 0-10V, the transmitter will generate 10 V.

⚠️ **If the deviations are too large (>0,05V or >0,05mA) between the signal issued and the value displayed on the multimeter, we recommend that you return the transmitter to our factory.**

ℹ️ For the diagnostic of the **channel 2**, go to **F 313** folder and perform the same procedure as for the channel 1.
For the diagnostic of the **channel 3**, go to **F 323** folder and perform the same procedure as for the channel 1.

Measurement conversion charts :

- **Pressure**

Pa	mmH2O	InWG	mbar	mmHG	kPa	daPa	hPa
±100	±10.2	±0.40	±1.00	±0.75	±0.100	±10.0	±1.00
±1000	±102.0	±4.01	±10.00	±7.50	±1.000	±100.0	±10.00

- **Temperature**

°C	°F
From 0.0 to +50.0	From +32.0 to +122.0
From -20.0 to +80.0	From -4.0 to +176.0
From -40.0 to +180.0	From -40.0 to +356.0
From -100.0 to +400.0	From -148.0 to +752.0

6. F 400 : Manage the alarms

Three alarm modes are available :

- **Rising edge (1 threshold) :** the alarm goes off when the measurement **exceeds** the threshold and stops when it is **below** the threshold
- **Falling edge (1 threshold) :** the alarm goes off when the measurement is **below** the threshold and stops when it **exceeds** the threshold.
- **Monitoring (2 thresholds) :** the alarm goes off when the measurement is outside the defined low and high thresholds.

Rising edge
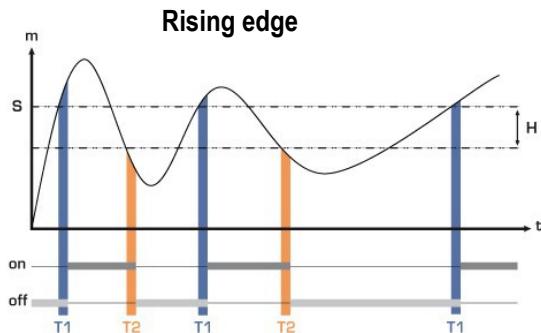
Measurement (m) > Threshold (S) during the time-delay T1 → Alarm activation
Measurement (m) < Threshold (S) - Hysteresis (H) during the time-delay T2 → Alarm deactivation

Falling edge
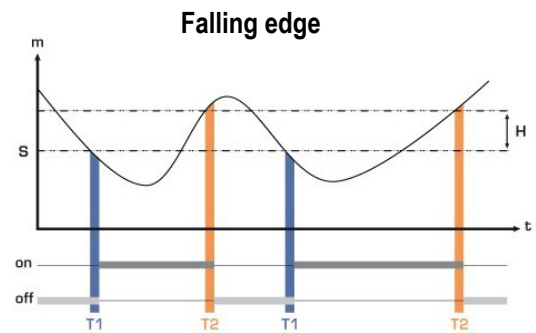
Measurement (m) < Threshold (S) during time-delay T1 → Alarm activation.
Measurement (m) > Threshold (S) + Hysteresis (H) during time-delay T2 → Alarm deactivation

Monitoring
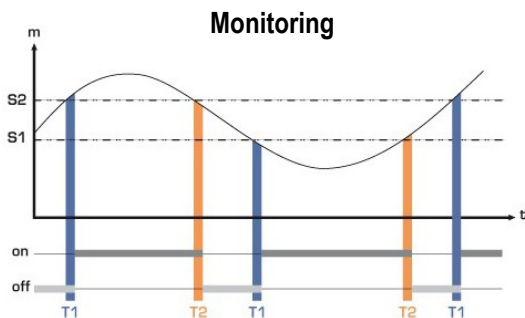
The alarm goes off when the measurement is outside the low and high thresholds.

When an alarm goes off, it is possible to acknowledge it pressing OK key on the transmitter.

It is possible to set 3 different alarms :
- **F400** folder corresponds to the **alarm 1** setting
- **F410** folder corresponds to the **alarm 2** setting
- **F420** folder corresponds to the **alarm 3** setting

The alarm setting procedure explained below corresponds to the alarm 1 setting. For the alarms 2 and 3 settings, go to the corresponding folder and perform the same procedure as for the alarm 1.

The transmitter is powered on.
➢ Press OK.
➢ Enter the activation code (see page 6).
➢ Press OK.
➢ Press + to go to F 400 folder then press twice OK.
 This folder is about the alarm mode.
➢ Press + or – key to select the required alarm mode.
- ***OFF :OFF :*** *alarm is deactivated*

- **1/3 :** *rising edge mode*
- **2/3 :** *falling edge mode*
- **3/3 :** *monitoring mode*

➢ Press OK.
  "F400" *blinks.*

➢ Press + key to the F401 folder of the alarm 1 (F411 for alarm 2 and F421 for alarm 3) then press OK.

➢ Press + or – key then select the channel where the alarm will be activated.

➢ Press OK.
  "F401" blinks.

➢ Press + key to go to F402 folder (F412 for alarm 2 and F422 for alarm 3) then press OK.
  *This folder is about the **threshold 1** setting.*

➢ Set the threshold 1 with + and – keys.

➢ Press OK when the last digit is set.
  "F402" *blinks.*

➢ Press + key to go F403 folder (F413 for alarm 2 and F423 for alarm 3) then press OK.
  This folder is about :
  - *For a rising or falling edge : **hysteresis setting***
  - *For a monitoring : **threshold 2 setting.***

➢ Set the hysteresis or the threshold 2 with + and – keys.

➢ Press OK when the last digit has been set.
  "F403" *blinks.*

➢ Press + key to go to F404 folder (F414 for alarm 2 and F424 for alarm 3) then press OK.
  *This folder is about the **delay time 1** setting.*

➢ Set the delay time 1 with + and – keys.

➢ Press OK when the last digit has been set.
  "F404" *blinks.*

➢ Press + key to go to F405 folder (F415 for alarm 2 and F425 for alarm 3) then press OK..
  *This folder is about the **delay time 2** setting.*

➢ Set the delay time 2 with + and – keys.

➢ Press OK when the last digit has been set.
  "F405" *blinks.*

➢ Press Up key to go to F406 folder (F416 for alarm 2 and F426 for alarm 3) then press OK..
  *This folder allows to activate or not the **audible alarm**.*

➢ Set the activation of the audible alarm with + and – keys :
  - **1 :** *audible alarm is activated*
  - **2 :** *audible alarm is deactivated*

7. F 500 : Set the measurements

This part allows to set an integration coefficient, to perform an autozero, to set a delay time between two autozeros.
In order to compensate a possible drift of the sensor, it is possible to add an offset and/or a coefficient to the value displayed by the transmitter.

7.1. Perform an autozero

ℹ️ This setting is only available if the CA310 has a SPI-2 pressure board.

CA10 transmitters have a manual autozero which guarantees a good reliability of the measurement in high and low ranges.
The autozero compensates for any long-term drift of the sensitive element, with the manual adjusting of the zero.
To perform a self-calibration :
- ➤ Press Esc during 8 seconds.
  The transmitter beeps that indicates the autozero has been well performed.

7.2. Integration of the pressure measurement

ℹ️ This setting is only available if the CA310 has a pressure board.

The pressure measurement element is very sensitive and reacts to pressure changes. When making measurements in unstable air movement conditions, the pressure measurement may fluctuate. The integration coefficient (from 0 to 9) makes an average of the measurements ; this helps to avoid any excessive variations and guarantees a stable measurement.
New displayed value = [((10 - Coef.) x New Value) + (Coef. x Old value)] /10
Example : CA 310 (0-1000 Pa) – Current measurement : 120 Pa – New measurement : 125 Pa
The pressure source being stable, the user selects a low integration. Integration : 1, maximum admitted variation ±10 Pa.
The variation is lower than 10 Pa, it is possible to apply the integration calculation formula.
Next displayed value : ((9 * 125) + (1 *120))/10 = 124.5 i.e, 124 Pa. If the new measurement had been de 131 Pa, the next displayed value would have been 100% of the new value i.e, 131 Pa.

    The transmitter is powered on.
- ➤ Press OK.
- ➤ Enter the activation code (see page 6).
- ➤ Press OK.
- ➤ Press + key to go to F500 folder.
- ➤ Press OK.
- ➤ Set the integration value with + and – keys.

This value is between 0 and 9 with :
- • **Coefficient 0 :** *no integration, important fluctuation of the displayed value*
- • **Coefficient 9 :** *maximum integration, more stable measurement display.*

7.3. Delay times between 2 autozeros

ℹ️ This setting is only available if the CA310 has a pressure board.

Thanks to the temperature compensation of the gain (from 0 to 50°C) and to the autozero system, Class 310 transmitters guarantee an excellent long-term stability, along with a great measurement accuracy.
Autozero principle : the microprocessor drives a solenoid valve that compensates for any long-term drift of the sensitive element.
Compensation is made by regular automatic adjustment of the zero. True differential pressure measurement is then made regardless of the environmental conditions of the transmitter.

    The transmitter is powered on.
- ➤ Press OK.

- ➢ Enter the activation code (see page 6).
- ➢ Press OK.
- ➢ Press + key to go to F500 folder.
- ➢ Press OK.
- ➢ Press + key to go to F510 folder.
- ➢ Press OK.
  The duration between 2 self-calibrations is displayed.
- ➢ Set the duration with + and – keys.
  This delay time must be between OFF (no self-calibration) and 60 minutes.
- ➢ Press OK to validate the duration.

7.4.   Add a coefficient

The correction coefficient allows to apply a correction to a measurement.
  The transmitter is powered on.
- ➢ Press OK.
- ➢ Enter the activation code (see page 6).
- ➢ Press OK.
- ➢ Press + key to go to F500 folder.
- ➢ Press OK.
- ➢ Press + key to go to F520 folder then press OK.
  ***"F 520"** blinks, corresponding to the folder of the gain setting for the channel 1.*
- ➢ Press OK.
  The 1st digit of the gain blinks.
- ➢ Enter with + and – keys the figure value or the negative sign of the value then press OK.
  The 2nd digit blinks.
- ➢ Enter with + and – keys its value then press OK.
- ➢ Perform the same procedure for the following figures.
- ➢ Press OK when the last digit has been set.
  F 520 blinks, the coefficient for the channel 1 is set.

To add a gain to the **channel 2**, go to **F 530** folder and perform the same procedure as for the channel 1.
To add a gain to the **channel 3**, go to **F 540** folder and perform the same procedure as for the channel 1.

7.5.   Add an offset

In order to compensate any possible drift of the sensor, it is possible to add an offset to the value displayed by the transmitter entering a digital value via the keypad.
  The transmitter is powered on.
- ➢ Press OK.
- ➢ Enter the activation code (see page 6).
- ➢ Press OK.
- ➢ Press + key to go to F500 folder.
- ➢ Press OK.
- ➢ Press + key to go to F 521 folder then press OK.
  ***"F 521"** blinks, corresponding to the folder of the offset setting for the channel 1.*
- ➢ Press OK.
  The 1st digit of the offset blinks.
- ➢ Enter with + and – keys the figure value or the negative sign of the value then press OK.
  The 2nd digit blinks.
- ➢ Enter with + and – keys its value then press OK.
- ➢ Perform the same procedure for the following figures.

➢ Press OK when the last digit has been set.
   F 521 blinks, the offset for the channel 1 is set.

To add an offset to the **channel 2**, go to **F 531** folder and perform the same procedure as for the channel 1.
To add an offset to the **channel 3**, go to **F 541** folder and perform the same procedure as for the channel 1.

8. F 600 : Configure the boards and probes

This part allows to set the following parameters :
- **for an air velocity and airflow probe : (hotwire or vane) :** the type of section, the correction factor, the integration in air velocity and the compensation in atmospheric pressure (only available for hotwire probes)
- **For a pressure board :** air velocity and airflow (if the option is activated), the integration in pressure.
- **For a CO₂ probe :** the compensation in atmospheric pressure
- **For an hygro/temperature probe :** the compensation in atmospheric pressure for the psychrometry calculations.

You can **modify the temperature compensation value.** The air velocity and airflow measured with a differential probe (such as Pitot tube, Debimo blade, orifice plate...) depends on the working temperature. Then, it is required to enter the **operating temperature** to get more accurate results. You can enter the value either manually or using a thermocouple K probe which offers the automatic temperature compensation.

8.1.   Configure a pressure board

8.1.1   Set the temperature

The transmitter is powered on.
➢ Press OK.
➢ Enter the activation code (see page 6).
➢ Press OK.
➢ Press + key to go to F600 folder.
➢ Press twice OK.
F600 blinks and the temperature mode is displayed.
➢ Press OK.
➢ Select the temperature mode with + and – keys.
   - **1/3 :** manual input of the temperature
   - **2/3 :** automatic temperature (thermocouple)
   - **3/3 :** automatic temperature (probe)
➢ Press OK.

If the manual input of the temperature has been selected :
➢ Press + key to go to F601 folder that allows to set the temperature unit then press OK.
➢ Select the temperature unit with + and – keys then press OK.
➢ Press + key to go to F602 folder that allows to set the temperature then press OK.
➢ Set the temperature with + and – keys then press OK.

If an automatic temperature has been selected :
➢ Press + key to go to F603 folder.

8.1.2   Set the atmospheric pressure or the altitude

The temperature has been selected.
➢ Press + key to go to F603 folder then press OK.
➢ Select the atmospheric pressure unit between hPa, mbar and mmHg or select **"m"** for the altitude.
➢ Press OK.
➢ Press + key to go to F604 folder then press OK.
➢ Set the atmospheric pressure.
   Or
➢ Press + key to go to F605 folder then press OK.
➢ Set the altitude.
➢ Press OK.

8.1.3 Select the measuring device

The atmospheric pressure or the altitude has been configured.

➢ Press + key to go to F610 folder then press OK.
➢ Select the type of measuring device :
  - **1/4 :** Pitot tube L (coefficient : 1.0015)
  - **2/4 :** Pitot tube S (coefficient : 0.84)
  - **3/4 :** Debimo blades (coefficient : 0.8165)
  - **4/4 :** Coefficient of the element (free coefficient)
➢ Press OK.

If the coefficient of the element has been selected :
  ➢ Press + key to go to F611 folder then press OK.
  ➢ Set the coefficient value with + and – keys then press OK.

8.1.4 Enter a correction factor in air velocity

This correction coefficient allows to adjust the transmitter according to data in air velocity of the installation.
How to calculate it ? For example, the air velocity in your section is **17 m/s** and the transmitter displays **16.6 m/s**. The coefficient to apply is **17 / 16,6** it means **1.024.**
  ➢ Press + key to go to F612 folder then press OK.
  ➢ Set the correction value with + and – keys then press OK.

The correction factor must be between 0.2 and 2.

8.1.5 Configure the section

➢ Press + key to go to F620 folder then press OK.
➢ Press + key to select the thype of section between :
  - **1/3 :** rectangular section
  - **2/3 :** circular section
  - **3/3 :** airflow coefficient
➢ Press OK.
➢ Press + key to go to F621 folder then press OK.
➢ Select the unit of the section (mm or inch) with + key for a rectangular or circular section.
➢ Press OK.
➢ Press + key to go to F622 folder then press OK.
➢ Set the length of the rectangular section if the type of selected section is rectangular then press OK.
➢ Press + key to go to F623 folder then press OK.
➢ Set the width of the rectangular section if the type of selected section is rectangular then press OK.
➢ Press + key to go to F624 folder then press OK.
➢ Set the diameter of the circular section if the type of selected section is circular then press OK.
➢ Press + key to go to F625 folder then press OK.
➢ Set the airflow coefficient if the of selected section is airflow coefficient then press OK.
➢ Press + key to go to F626 folder then press OK.
➢ Select the airflow unit if the type of selected section is airflow coefficient.

This airflow coefficient allows to calculate an airflow from the pressure. It is indicated by the manufacturer of the devices supplied with pressure connections (+ and -). From the square root of the measured pressure (Delta P) and from this coefficient, you get the airflow. Airflow = C_D x $\sqrt{\Delta pressure}$

The coefficient must be between 0.1 and 9999.9.
Available units for the reference unit are : Pa, mmH$_2$O, inWg and mbar.

8.2. Configure a probe

8.2.1 Set the atmospheric pressure or the altitude

The transmitter is powered on.

➢ Press OK.
➢ Enter the activation code (see page 6).
➢ Press OK.
➢ Press + key to go to F600 folder.
➢ Press OK then + key to go to F630 folder.
➢ Select the unit the atmospheric pressure between hPa, mbar and mmHg or select "m" for the altitude then press OK.
➢ Press + key to go to F631 folder then press OK.
➢ Set the atmospheric pressure.
  Or
➢ Press + key to go to F632 folder then press OK.
➢ Set the altitude.
➢ Press OK.

8.2.2 Set the section

➢ Go to F650 folder then press OK.
➢ Press + key to select the type of section between :
  • **1/3 :** rectangular section
  • **2/3 :** circular section
➢ Press OK.
➢ Go to F651 folder then press OK.
➢ Select the unit of the section (mm or inch) with + key for a rectangular or circular section.
➢ Press OK.
➢ Press + key to go to F652 folder then press OK.
➢ Set the length of the rectangular section if the type of selected section is rectangular then press OK.
➢ Press + key to go to F653 folder then press OK.
➢ Set the width of the rectangular section if the type of selected section is rectangular then press OK.
➢ Press + key to go to F654 folder then press OK.
➢ Set the diameter of the circular section if the type of selected section is circular then press OK.

8.2.3 Select a normative value

It is possible to select a standard allowing to bring the measured values to measured values in normal environmental conditions.

➢ Go to F690 folder then press OK.
➢ Press + key to select the standard :
  • OFF : no standard
  • DIN1343
  • ISO2533

9. Functions recap and Modbus connections

9.1. F 100

Code	Modbus	Description	Possibilities
F 100	1000	Serial number of the transmitter	
F 101	1010	Firmware version	
F 140	1400	Keypad locking	0 : deactivated 1 : activated
F 141	1410		
F 150	1500	Modbus slave number	From 1 to 255
F 151	1510	Modbus speed communication	2400 / 4800 / 9600/ 19200 / 38400 / 115200 bds
F 170	1700	Activation of the high resolution in pressure option	1 : activated / 0 : deactivated
F 171	1710	Activation of the Modbus option	1 : activated / 0 : deactivated
F 180	1800	Activation of digital inputs	ON / OFF
F 190	1900	Back to factory configuration	

9.2. F 200

Code	Modbus	Description	Possibilities
F 200	2000	Channel 1 activation/deactivation	Probe : SDE Board : PRES Deactivated: OFF
F 210	2100	Channel 2 activation/deactivation	Probe : SDE Board : PRES Deactivated : OFF
F 220	2200	Channel 3 activation/deactivation	Probe : SDE Board : PRES Deactivated : OFF
F 201	2010	Unit selection of the channel 1	According to probe and board
F 211	2110	Unit selection of the channel 2	According to probe and board
F 221	2210	Unit selection of the channel 3	According to probe and board

9.3. F 300

Code	Modbus	Description	Possibilities
F 300	3000	Analogue output selection of the channel 1	4-20 mA / 0-20 mA / 0-10 V / 0-5 V
F 310	3100	Analogue output selection of the channel 2	4-20 mA / 0-20 mA / 0-10 V / 0-5 V
F 320	3200	Analogue output selection of the channel 3	4-20 mA / 0-20 mA / 0-10 V / 0-5 V
F 301	3010	Channel 1 minimum range	From -1999 to 9999

Code	Modbus	Description	Possibilities				
F 302	3020	Channel 1 maximum range	From -1999 to 9999				
F 311	3110	Channel 2 minimum range	From -1999 to 9999				
F 312	3120	Channel 2 maximum range	From -1999 to 9999				
F 321	3210	Channel 3 minimum range	From -1999 to 9999				
F 322	3220	Channel 3 maximum range	From -1999 to 9999				
F 303	3030	Channel 1 diagnostic : generation of a current or a voltage	Display	Generation according to the output signal			
				0-10 V	0-5 V	0-20 mA	4-20 mA
			1/3	0 V	0 V	0 mA	4 mA
			2/3	5 V	2.5 V	10 mA	12 mA
			3/3	10 V	5 V	20 mA	20 mA
F 313	3130	Channel 2 diagnostic : generation of a current or a voltage	Display	Generation according to the output signal			
				0-10 V	0-5 V	0-20 mA	4-20 mA
			1/3	0 V	0 V	0 mA	4 mA
			2/3	5 V	2.5 V	10 mA	12 mA
			3/3	10 V	5 V	20 mA	20 mA
F 323	3230	Channel 3 diagnostic : generation of a current or a voltage	Display	Generation according to the output signal			
				0-10 V	0-5 V	0-20 mA	4-20 mA
			1/3	0 V	0 V	0 mA	4 mA
			2/3	5 V	2.5 V	10 mA	12 mA
			3/3	10 V	5 V	20 mA	20 mA

9.4.   F 400

Code	Modbus	Description	Possibilities
F 400 – F 410 – F 420	4000 – 4100 – 4200	Alarm mode	1/3 : rising edge 2/3 : falling edge 3/3 : monitoring
F 401 – F 411 – F 421	4010 – 4110 – 4210	Channel selection	1 : channel 1 2 : channel 2 3 : channel 3
F 402 – F 412 – F 422	4020 – 4120 – 4220	Threshold 1 setting	According to the connected probe
F 403 – F 413 – F 423	4030 – 4130 – 4230	Threshold 2 or hysteresis setting	According to the connected probe
F 404 – F 414 – F 424	4040 – 4140 – 4240	Delay time 1 setting	From 0 to 600 s
F 405 – F 415 – F 425	4050 – 4150 – 4250	Delay time 2 setting	From 0 to 600 s

| F 406 – F 416 – F 426 | 4060 – 4160 - 4260 | Audible alarm | 1 : activated / 0 : deactivated |

9.5.   F 500

Code	Modbus	Description	Possibilities
F 500	5000	Measurement integration (pressure)	From 0 to 9
F 510	5100	Delay time between two autozeros	From 0 to 60 min
F 520	5200	Channel 1 coefficient	From 0.01 to 5
F 530	5300	Channel 2 coefficient	From 0.01 To 5
F 540	5400	Channel 3 coefficient	From 0.01 to 5
F 521	5210	Channel 1 offset	According to the probe
F 531	5310	Channel 2 offset	According to the probe
F 541	5410	Channel 3 offset	According to the probe

9.6.   F 600

Code	Modbus	Description	Possibilities
F 600	6000	Temperature mode	1/3 : manual 2/3 : auto (thermocouple) 3/3 : auto (probe)
F 601	6010	Temperature unit	°C or °F
F 602	6020	Temperature value	
F 603	6030	Atmospheric pressure unit or altitude unit for pressure board	hPa, mbar, mmHg or m
F 604	6040	Pressure value	
F 605	6050	Altitude value	
F 610	6100	Differential pressure device	1/4 : Pitot type L 2/4 : Pitot type S 3/4 : Debimo blade 4/4 : differential pressure coefficient
F 611	6110	Differential pressure coefficient	
F 612	6120	Air velocity correction	Between 0.2 and 2
F 620	6200	Type of section	1/3 : rectangular 2/3 : circular 3/3 : airflow coefficient
F 621	6210	Unit of the section	mm or inch
F 622	6220	Length of the rectangular section	
F 623	6230	Width of the rectangular section	
F 624	6240	Diameter of the circular section	
F 625	6250	Airflow coefficient	Between 0.1 and 9999.9
F 626	6260	Pressure unit for the airflow	Pa, mmH$_2$O, inWg and mbar

F 630	6300	Atmospheric pressure unit or altitude unit for a measurement probe	hPa, mbar, mmHg or m
F 631	6310	Pressure value	
F 632	6320	Altitude value	
F 690	6900	Normative value	OFF DIN1343 ISO2533

www.kimo.fr

afaq
ISO 9001
Qualité
AFNOR CERTIFICATION