

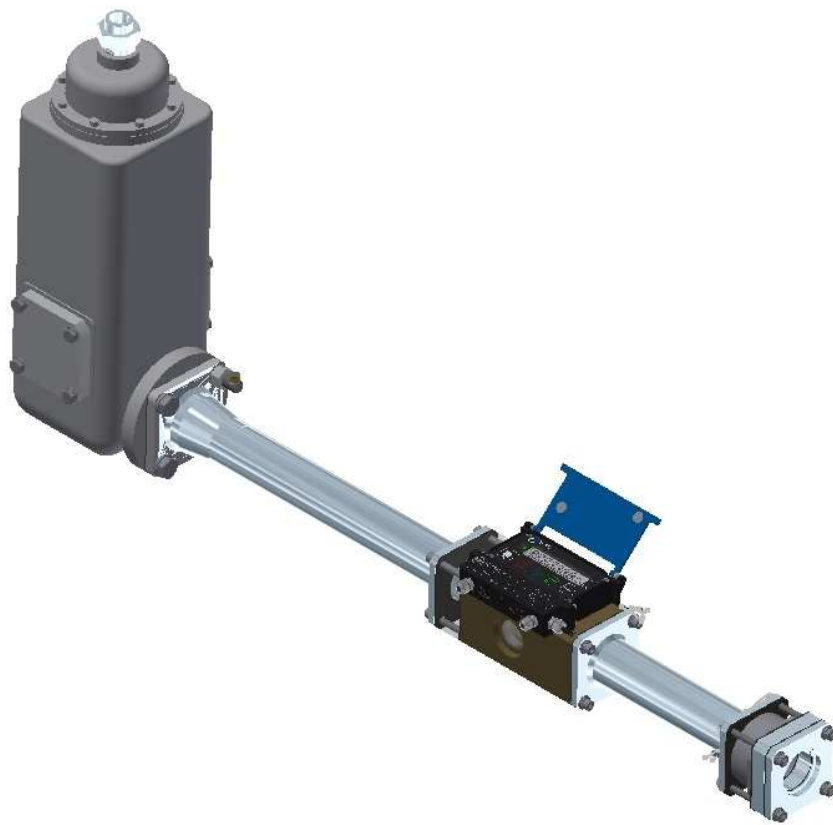
# OPERATING MANUAL

## MU 7112 EN A


### METERING SLEEVE for

### FUEL METERING SYSTEM FMS OEM UTP

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|       |            |                   |            |             |
|-------|------------|-------------------|------------|-------------|
| A     | 2019/01/30 | Creation [PJV147] | DSM        | PJ          |
| Issue | Date       | Modifications     | Written by | Approved by |

|                                                                                     |                                                                                             |           |
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MU 7112 EN A  
 FUEL METERING SYSTEM FMS OEM UTP

This document is available on [www.alma-alma.fr](http://www.alma-alma.fr)

## 1 GENERAL PRESENTATION AND DESCRIPTION

The installer can associate the METERING SLEEVE FMS OEM UTP to a PUMPING GROUP and a HOSE. The whole is a FUEL METERING SYSTEM MID type-approved: MEASURING SYSTEM FMS OEM type UTP.

The FMS OEM UTP measures liquids other than water such as petrol, fuel, diesel or biofuels.

The METERING SLEEVE FMS OEM UTP contains these parts:

- ⇒ A gas separator
- ⇒ A sleeve upstream from the meter
- ⇒ A sight glass
- ⇒ A turbine counter: an ALMA ADRIANE turbine meter and a UNI calculator-indicating device
- ⇒ An temperature sensor
- ⇒ A downstream sleeve
- ⇒ A non-return valve

The FMS OEM can:


- ⇒ Measure quantities of products
- ⇒ Control the product temperature
- ⇒ Show volume in metering conditions or volume converted to the reference temperature
- ⇒ Manage measuring operations. Une opération peut être un chargement de produit
- ⇒ Manage faults

Optional functions are available:






- ⇒ The MPLS device can be associated to the UNI.
  - It is used to preset the volume and control the end of pouring if a fault occurs
  - A printer can print delivery tickets, internal totalisers, parameters, and summary and diary printings.

**NOTE:** The FMS OEM UTP shows the legally-binding information. The information printed by the printer has no metrological value.
- ⇒ With a CTD+ key, the FMS OEM UTP can transfer measurements results and parameters to a computer through a USB cable.

The UNI has a LCD backlight protected by a glass to display measurement information which can be read from the user interface.

|                                                                                     |                                                                                      |           |
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The UNI has five pushbuttons:

|                                                                                   |     |                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | BP5 | Lights the display during 10 seconds                                                                                                                                                               |
|  | BP4 | Normal mode: back to previous quantity<br>METROLOGICAL mode: increment the flashing figure when imputing a value or return to previous menu                                                        |
|  | BP3 | Normal mode, metering off: select the menu<br>Normal mode, metering on: display the values (immediate flow, temperature)<br>Metrological mode: select the figure to be modified or select the menu |
|  | BP2 | Normal mode: validate the selected menu or value<br>Metrological mode: validate the displayed value or the selected menu<br>In case of default: acknowledge the default                            |
|  | BP1 | The key is active when the UNI is autonomous. Reset the volume to zero and record the data of the last measurement                                                                                 |

## 2 OPERATING RECOMMENDATIONS

When it is not used, it's better to close the UNI cover.

The front face glass must be regularly cleaned for easy readability and better communication with the CTD+ key.

The CTD+ key is not ATEX, it must be used outside potentially explosive area.


The UNI is powered by two batteries. The display 'bAttErY' indicates that the batteries must be changed. Batteries must be changed in a non-explosive area. NOTE: Only approved persons are permitted to remove the seal.

See maintenance sheet FM 8009 about replacement of batteries.

## 3 OPERATION

The UNI performs the functions that follows:

- ⇒ The operating temperature is between -20°C and +50°C.
- ⇒ Acquisition and processing of the pulses from the pulse emitter or from inductive coils.
- ⇒ If required, it calculates and displays volume in metering conditions based on Kfactor determined during the calibration of the turbine, corrected during the calibration of the measuring system.  
In some cases, this volume in metering conditions can be corrected depending on the flowrate and/or the type of liquid measured.
- ⇒ If required, it calculates and displays the mean temperature of the liquid when it is measured by a Pt100 temperature sensor.
- ⇒ If required, it calculates and displays volume converted to base conditions. Volume is calculated by taking into account the mean temperature of the liquid during metering. Using a standard conversion formula, the conversion factor can be calculated according to density in base conditions.

|                                                                                     |                                                                                      |           |
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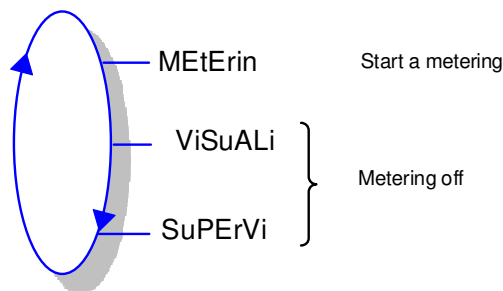
Density is entered manually prior to metering via the METROLOGICAL mode.

- ⇒ It memorizes and secures measurement information, which can be read from its user interface.
- ⇒ It registers accumulated volumes in metering conditions, even if the UNI is in alarm.

The UNI has two operation levels:

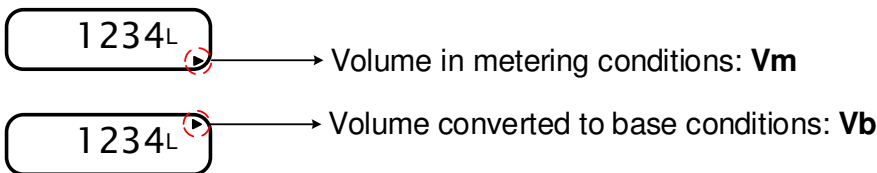
- ⇒ The USER mode for operation: measurement, visualization, supervision.
- ⇒ The METROLOGICAL mode for the configuration of the device by approved person.

#### 4 USER MODE



The UNI can be either ON or OFF metering.

The displayed volume depends on the configuration set in METROLOGICAL mode. The arrow pictogram located on the right hand of the display screen is used to point out Vm or Vb such as shown below:



### 4.1 Menu METERING – MEtErin

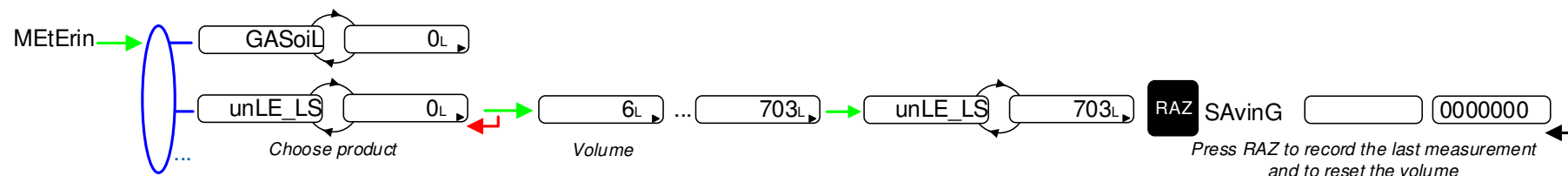
#### 4.1.1 Measuring system without preset mode: UNI

The recording sequence is set in METROLOGICAL mode (menu Aut SAV). It can be:

- Either manual (0)
- Or automatic after time-out (from 1 to 999 seconds).

#### MANUAL RECORDING WITH RAZ – Aut SAV=0

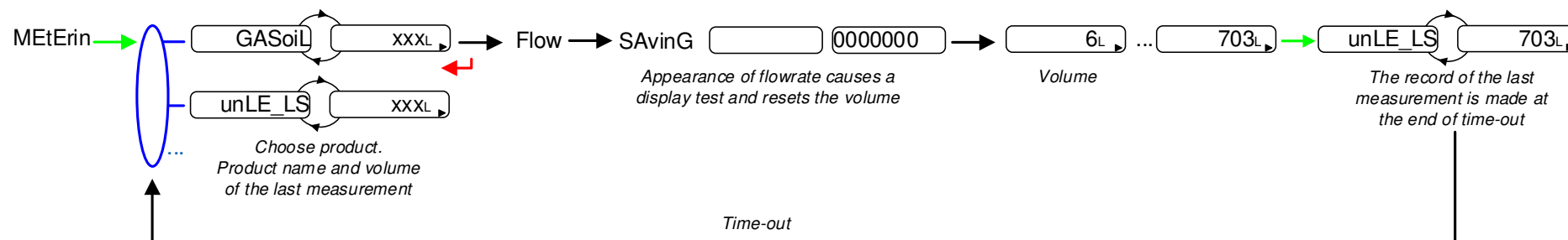
Press RAZ to test the display and reset the volume. The last measurement data is then recorded.



#### AUTOMATIC RECORDING after time-out – Aut SAV>1 (second)

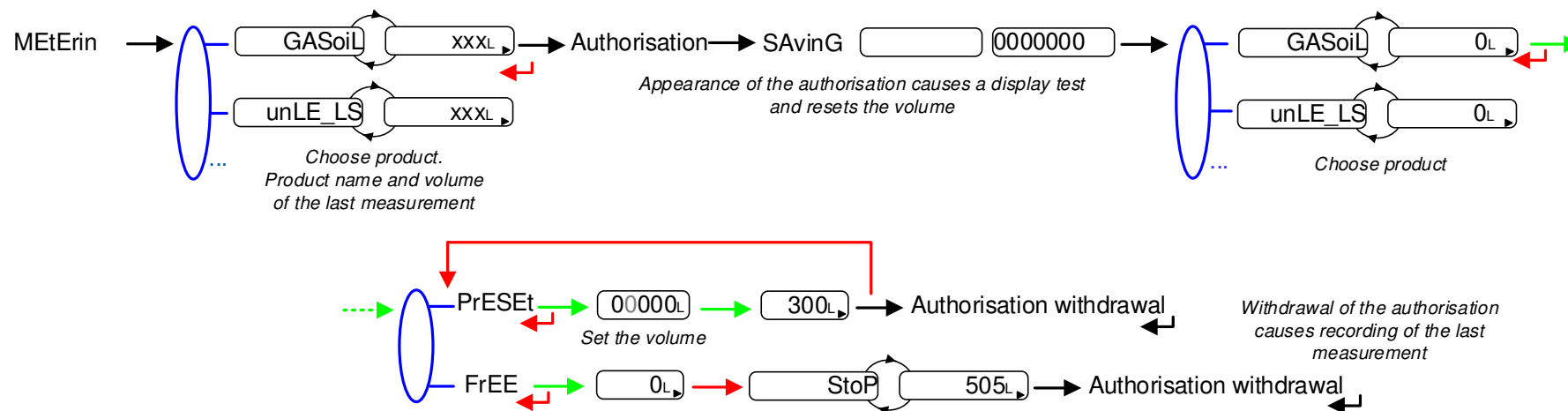
In that case, the RAZ button is disable.

At the beginning of measurement, appearance of flowrate causes a display test and resets the volume. The last measurement data is recorded at the end of measurement at zero flow and when the time-out is up.



### 4.1.2 Measuring system with preset mode: UNI MPLS

Appearance of the authorization causes a display test and resets the volume. Withdrawal of the authorization causes the end of measurement and the recording of the last measurement data.





#### 4.1.3 Visualization of values during delivery

During measurement, the following information may be displayed. Press BP3:

- One time for flowrate,
- Two times for temperature (if the temperature option is activated).

Display returns automatically to the current volume.

#### 4.1.4 Data recording and volume reset

Data recording and volume reset depend on the configuration of the UNI:

For a measuring system without MPLS:

- Manual recording sequence: volume reset and recording of the last measurement data are triggered by pressing RAZ at zero flow conditions
- Automatic recording sequence: the appearance of flowrate resets the volume to zero. The recording of the last measurement data are recorded when the time-out is up.

For a measuring system with MPLS: Appearance of the authorization resets the volume. Withdrawal of the authorization at zero flow conditions causes the recording of the last measurement data.

#### 4.1.5 Printing of a delivery ticket

Only with a measuring system with MPLS

If a printer is connected to the MPLS device, simply insert a ticket into the printer at the end of measurement and the delivery ticket is printed (see ANNEX).


#### 4.1.6 Transfer the measurement results to a computer – option



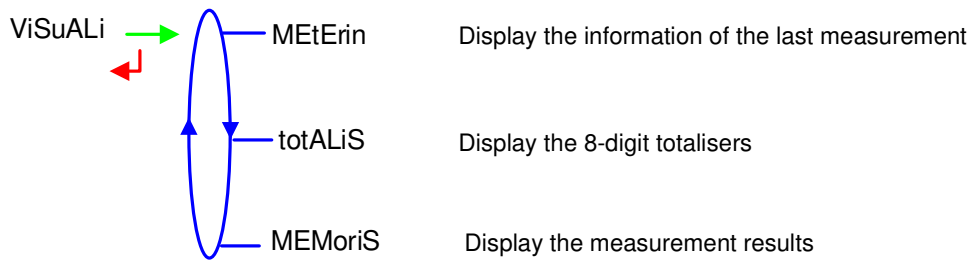
The CTD+ key is not ATEX, it must be used outside potentially explosive area.

This option is used to transfer parameters and measurements results to the key. Then, data may be downloaded from the key to a PC through USB cable. The transfer of the measurement results of the N last days is possible when flow rate is zero. N has to be set in SUPERVISOR menu

See Operating guide GU 7110 about transferring the measurement results of the UNI to a computer.

|                                                                                     |                                                                                      |           |
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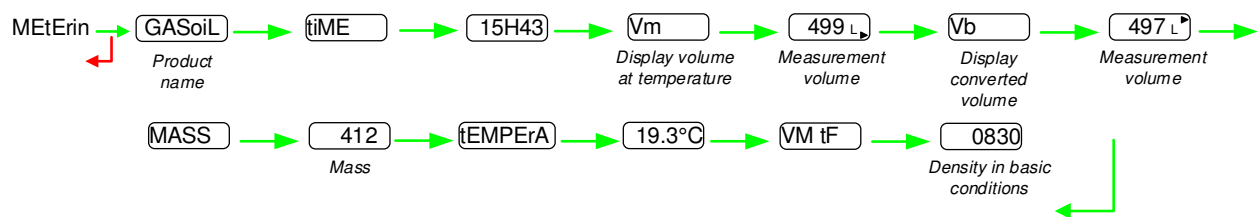
## 4.2 Menu VISUALISATION – ViSuALi



If the values are preceded by this display ‘-----’; it means they are no longer guaranteed.

### 4.2.1 Sub-menu METERING – MEtErin

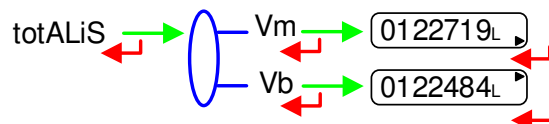
This menu displays the information of the last measurement. Information displayed depends on the UNI configuration.



### 4.2.2 Sub-menu TOTALISER – totALiS

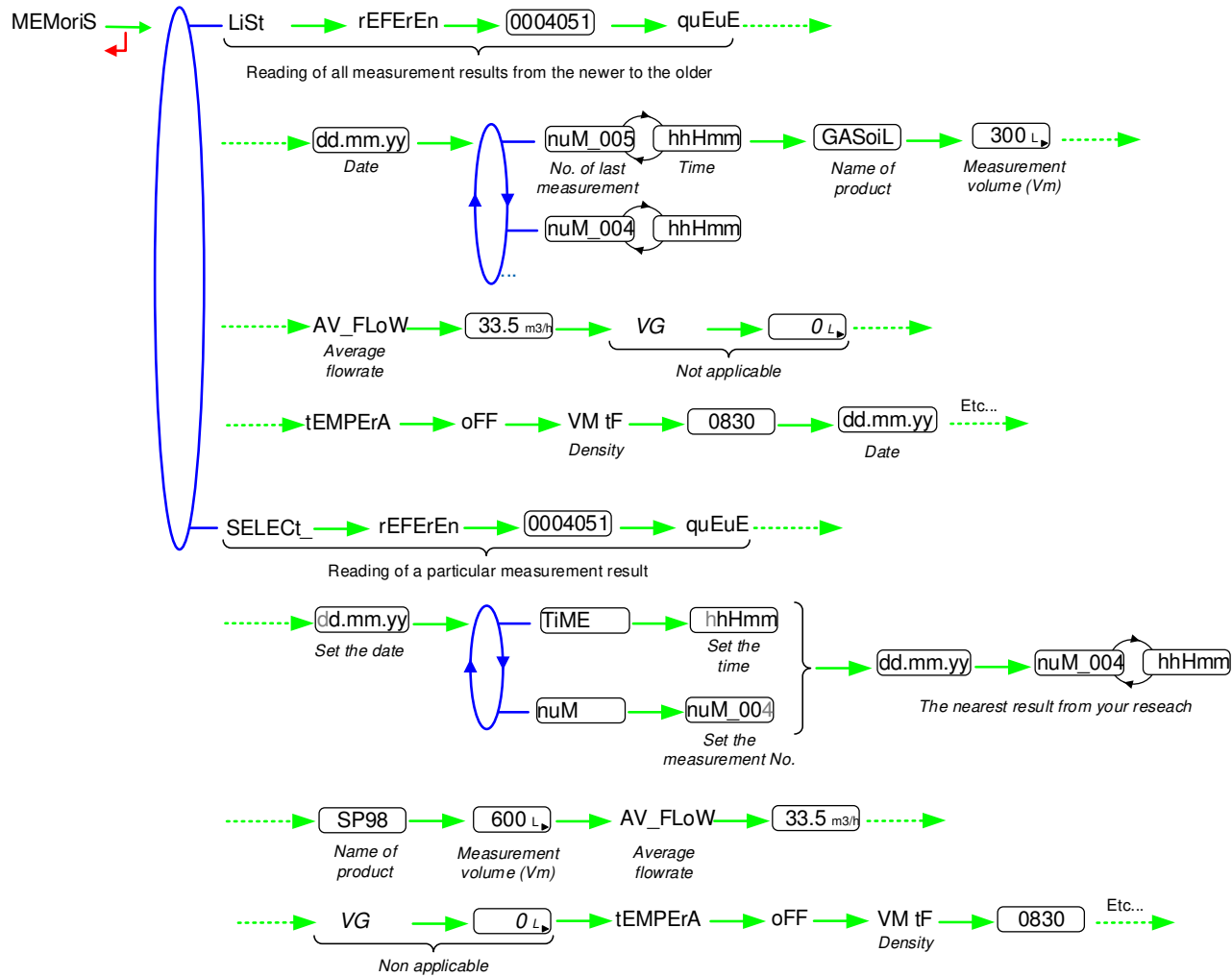
This menu displays:

- The totaliser of volume in metering conditions (Vm)
- The totaliser of volume converted to base conditions (Vb) if the temperature option is activated.

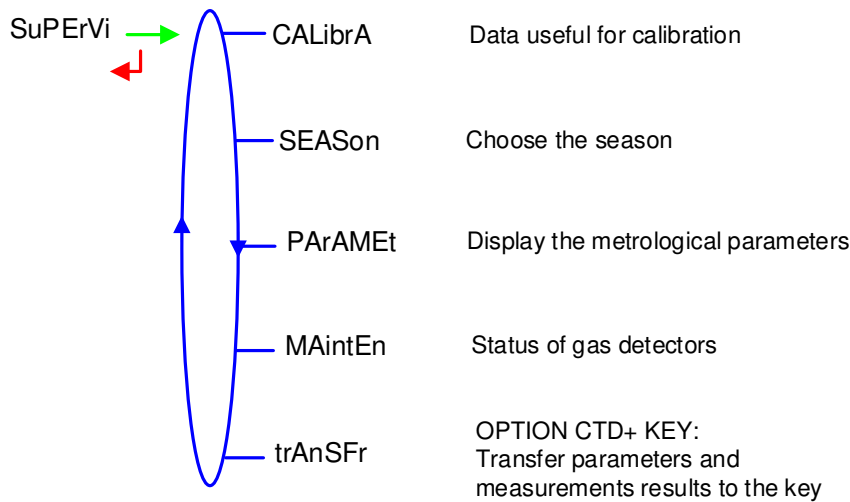


### 4.2.3 Sub-menu MEMORISATION – MEMoriS

Information displayed depends on the UNI configuration. Temperature, converted volume (Vb), and mass are only displayed if the temperature option is activated.



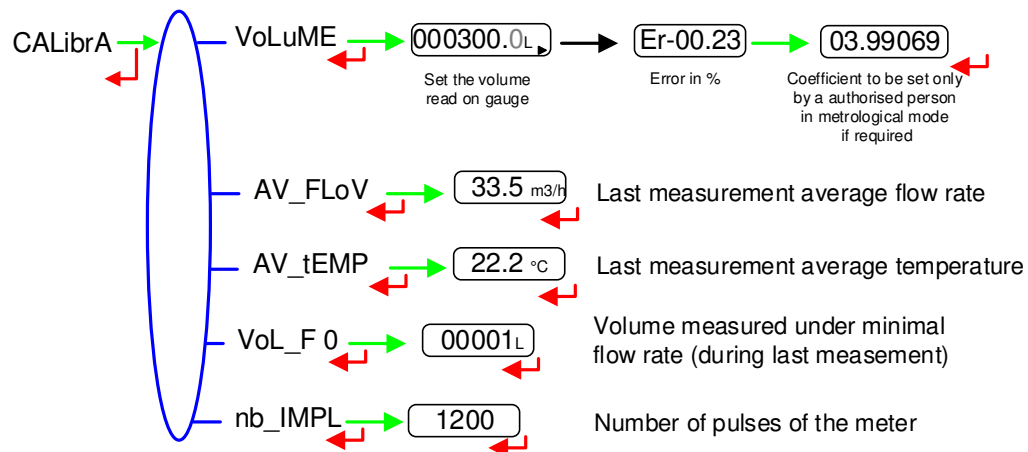
### 4.3 Menu SUPERVISOR – SuPERVi



#### 4.3.1 Sub-menu CALIBRATION – CALibrA

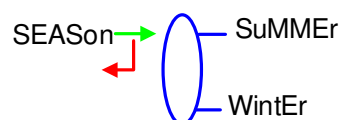
Measure the accuracy of the measuring system during the calibration with a gauge. This menu is available after a measurement sequence after withdrawal of authorization.

**NOTE:** Only approved persons are permitted to remove the seal.



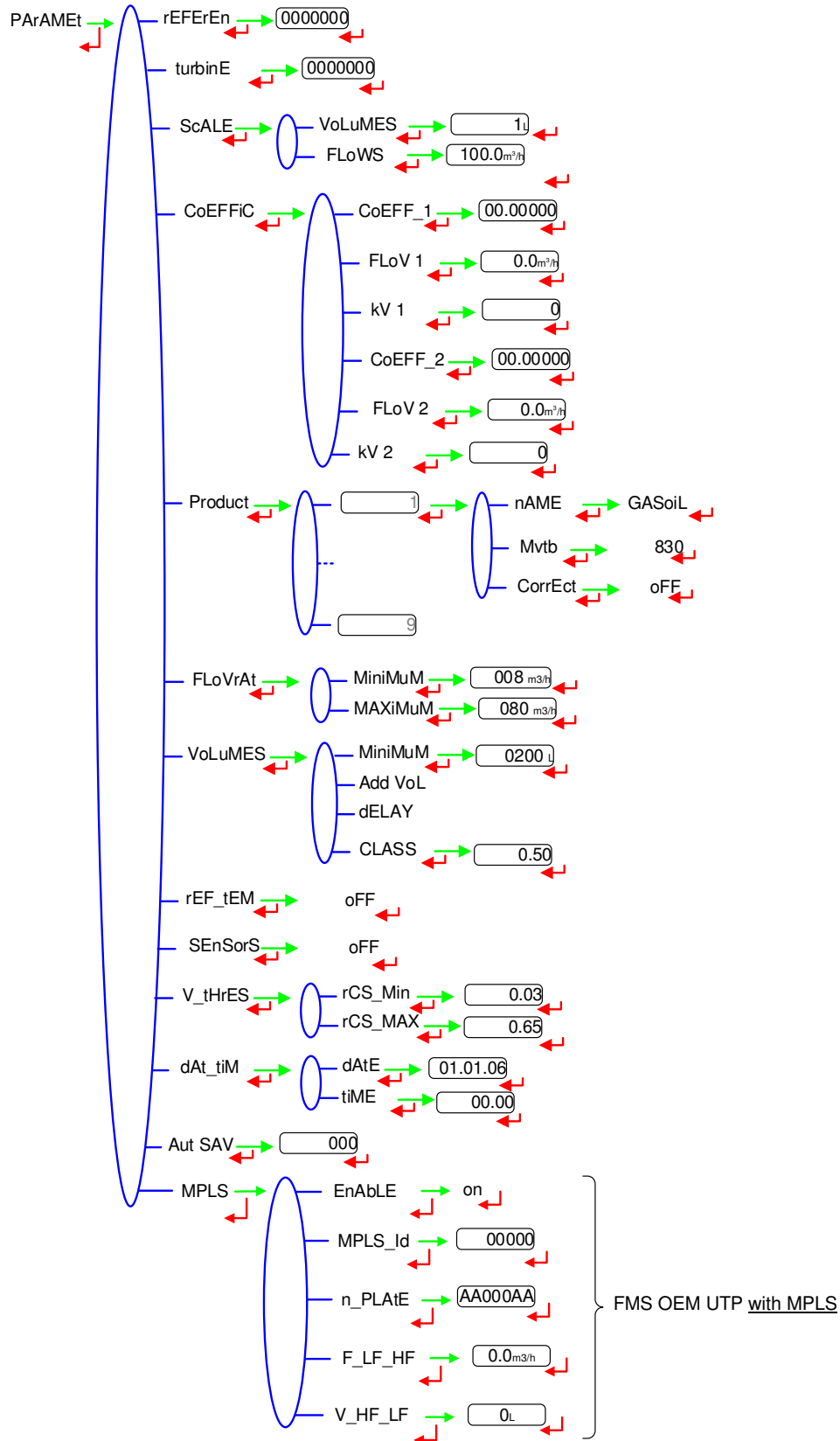
#### 4.3.2 Sub-menu SEASON – SEASon

Season is set in METROLOGICAL mode. This menu is used to change from summer to winter time (and back again).



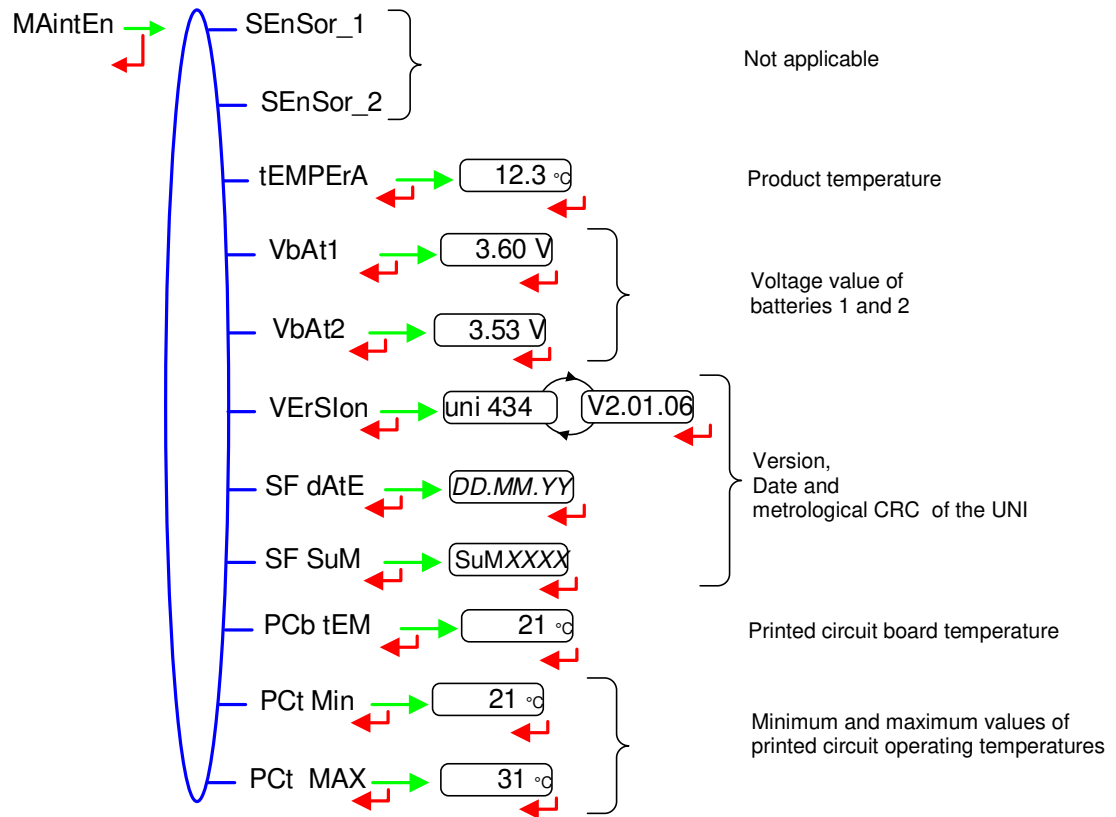
### 4.3.3 Sub-menu PARAMETERS – PArAMeT

This menu displays the parameters set in METROLOGICAL mode.



### 4.3.4 Sub-menu MAINTENANCE – MAIntEn

This menu displays the maintenance parameters.

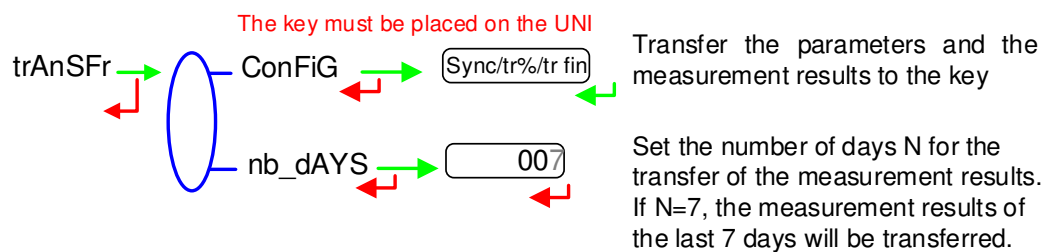


### 4.3.5 Sub-menu TRANSFERT – trAnSFr



The CTD+ key is not ATEX, it must be used outside potentially explosive area.

This sub-menu is available with the 'Transfer Key CTD+' option. It is used to transfer to the key the parameters set in METROLOGICAL mode and the measurement results and to download it to a PC. The file format is '.csv'. Refer to the Operating guide GU 7110.



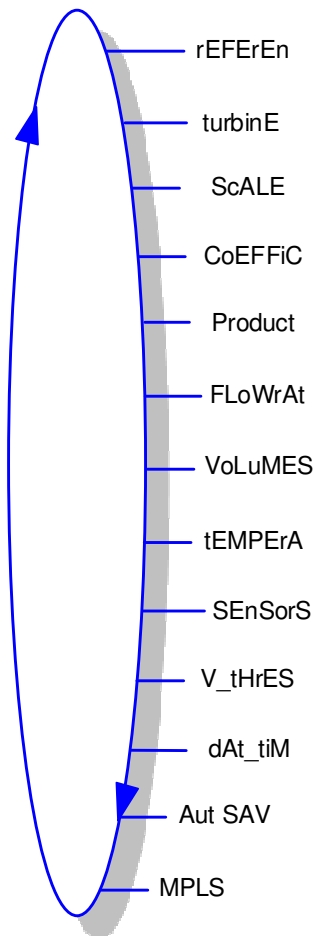
**NOTE:** Do not plug the USB cable during data transfer.

#### 4.4 List of alarms

Should a fault occur, the UNI displays the word "ALArM" and the fault title on the display (using some or all of the seven digits) followed by the displayed value. The operator acknowledges the fault by pressing down BP2 (even when pouring). Apart from battery related faults, persistent faults cannot be acknowledged. Once the fault is acknowledged, the selected value is displayed alternately with "-----" to indicate that the measured values are no longer guaranteed.

|           |         | DISPLAY                                                                                    | MEANING                                                                                              | ACTION                                                 |
|-----------|---------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| USER      | MPLS    | oVErFlo                                                                                    | Volume greater than 4 194 304 liters                                                                 | Reset the device                                       |
|           |         | LoW_FLo                                                                                    | Flow rate less than the setting minimal flow rate                                                    | Check the hydraulic configuration and the flowing      |
|           |         | StoP                                                                                       | Intentional interruption of delivery                                                                 | Stop delivery                                          |
|           |         | Author                                                                                     | The autorisation has been removed during pouring                                                     | The measurement is ended                               |
|           |         | LEAK                                                                                       | Counting of a volume greater than or equal to 1 liter (metering off)                                 | Acknowledge the alarm to end measurement               |
|           |         | dEFPrEd                                                                                    | Volume $\geq$ preset volume+1% the minimum quantity                                                  | Acknowledge the alarm                                  |
| REPARATOR |         | FLoV_                                                                                      | Flow setting fault                                                                                   | Check the parameters                                   |
|           |         | FrEQ_                                                                                      | Frequency fault                                                                                      | Check the parameters                                   |
|           |         | COEFF_                                                                                     | Difference two coefficients is greater than 0,5%                                                     | Check the coefficients setup                           |
|           |         | MEtEr                                                                                      | Problem of metering with the meter                                                                   | Check the setup                                        |
|           |         | HiGH_FL                                                                                    | Flow rate greater than the setting maximal flowrate                                                  | Check the setup                                        |
|           |         | dAtE                                                                                       | Loss of date and time                                                                                | Set date and time in metrological mode                 |
|           |         | CoIL                                                                                       | Loss of pulse transmitter signal                                                                     | Check the connection with the pulse transmitter        |
|           |         | tEMPERA                                                                                    | Temperature less than -20°C or greater than 50°C                                                     | Check the temperature sensor (measure and calibration) |
|           |         | diSPLAY                                                                                    | LCD display fault                                                                                    | If steady alarm, substitution of the UNI               |
|           |         | doG                                                                                        | Fault with card                                                                                      | If steady alarm, substitution of the UNI               |
|           |         | ProGrAM                                                                                    | Error on the cheksum of the metrological data                                                        | If steady alarm, substitution of the UNI               |
|           |         | rAM                                                                                        | Saved memory fault                                                                                   | If steady alarm, substitution of the UNI               |
|           |         | MEMoriS                                                                                    | Bad writing into the memory                                                                          | If steady alarm, substitution of the UNI               |
|           |         | FuLL                                                                                       | If a measurement result, not older than 3 months, is about to be erased                              | If steady alarm, substitution of the UNI               |
|           |         | MEtro_                                                                                     | Configuration loss                                                                                   | If steady alarm, substitution of the UNI               |
|           |         | bAttErY                                                                                    | Low battery                                                                                          | Substitution of the batteries                          |
|           |         | totAL_                                                                                     | Totaliser fault                                                                                      | If steady alarm, substitution of the UNI               |
|           | dEF_MEM | Loss of backup data concerning the last measurement                                        | If steady alarm, substitution of the UNI                                                             |                                                        |
|           | dEF_CoM | Communication fault with IRDA link                                                         | Check the IRDA link                                                                                  |                                                        |
|           | rECEPt  | Problem of communication protocol between the calculator-indicator UNI and the MPLS device | Check the compatibility of the software version of the MPLS device with the calculator-indicator UNI |                                                        |

## 5 METROLOGICAL MODE



The configuration parameters can only be modified after the processor configuration switch on the electronic card has been switched over.

**NOTE:** Only approved persons are permitted to change parameters.

Exit the METROLOGICAL mode thanks to the switch. The UNI resets.

### **WARNING**

**Setup must be done under cover, metering off.**

The option to display the volume in metering conditions (Vm) or the volume converted to base conditions (Vb) is made in METROLOGICAL mode when the temperature menu is activated.

### 5.1 Menu REFERENCE – rEFErEn

Enter the serial number of the UNI.

rEFErEn →  ←

### 5.2 Menu TURBINE – turbinE

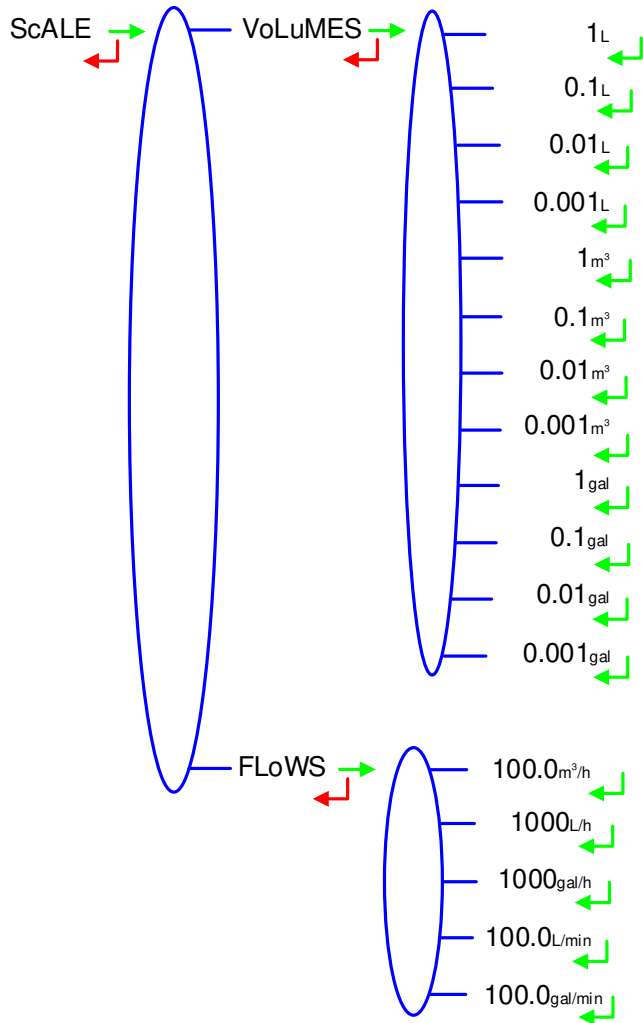
Enter the serial number of the turbine meter.

turbinE →  ←

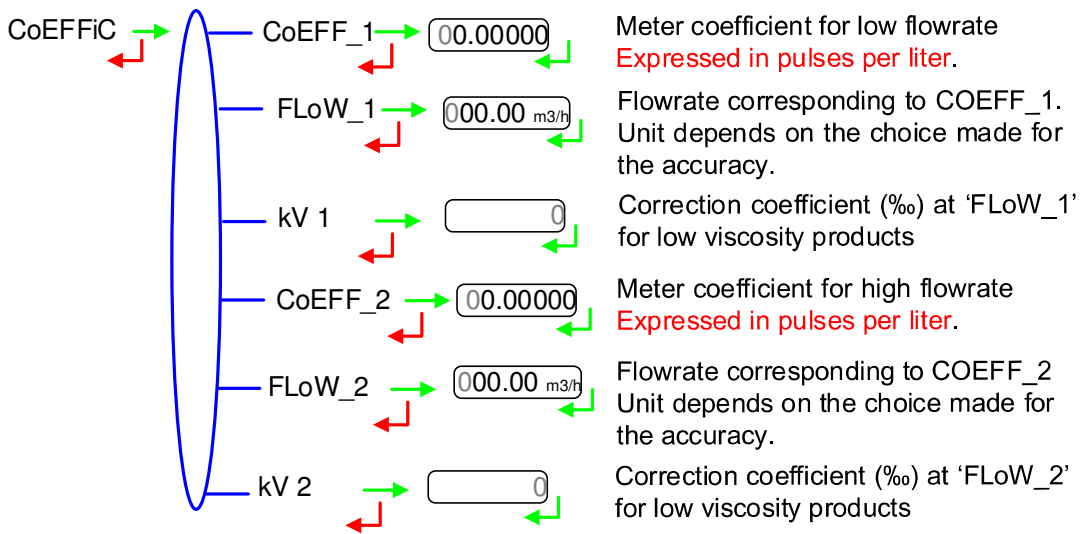


### 5.3 Menu SCALE – ScALE

Choose the unit for volume and flowrate.

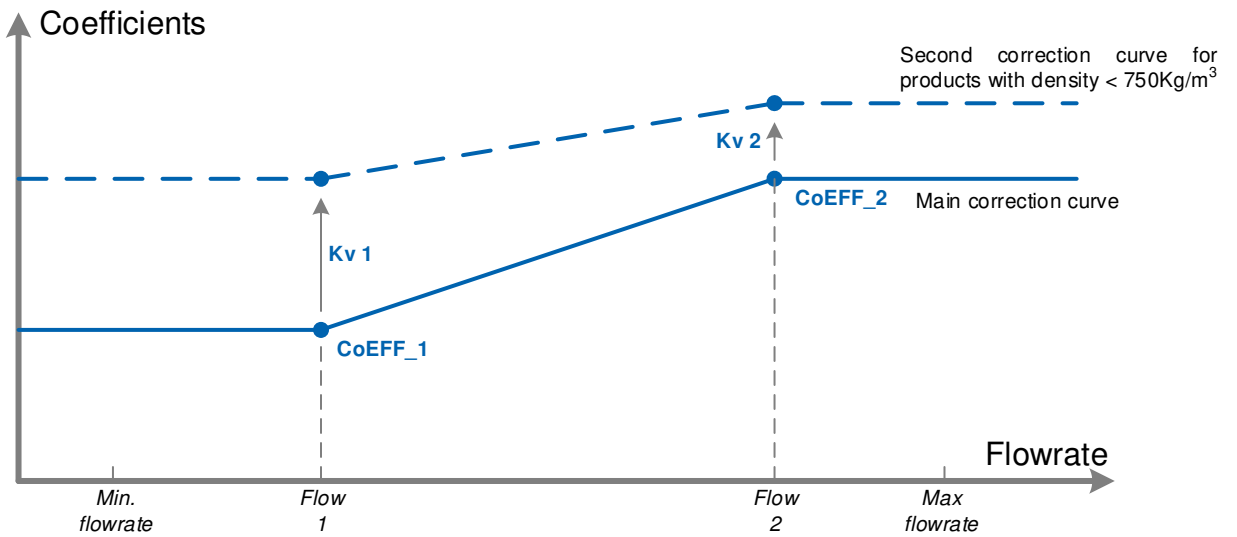


### 5.4 Menu COEFFICIENT – CoEFFiC



When parameters FLoW\_1 and FLoW\_2 are set to zero, parameters CoEFF\_2 and kV 2 are not applied.

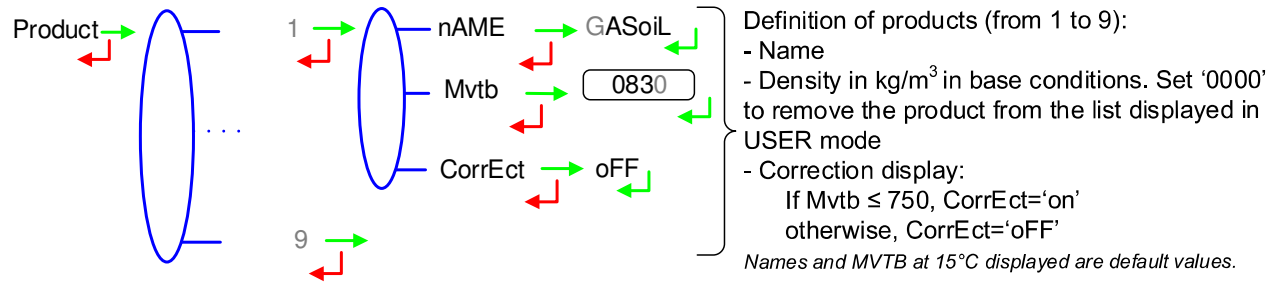
Adjustment of coefficients for several flowrates:



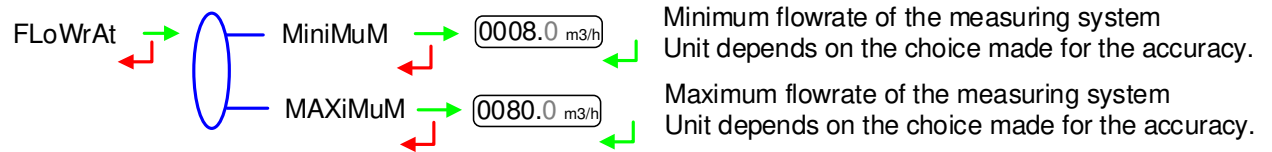
Coefficients applied in accordance with flowrate and product density

### 5.5 Menu PRODUCTS – Product

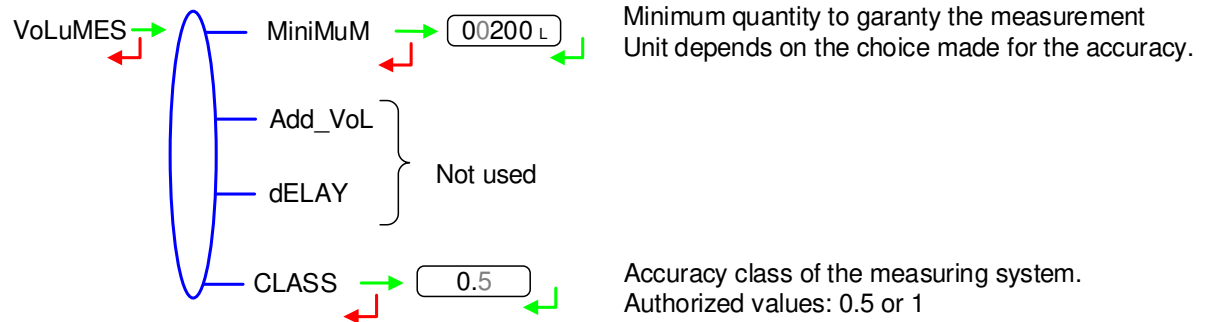
Definition of products.



### 5.6 Menu FLOWRATES – FLoWrAt



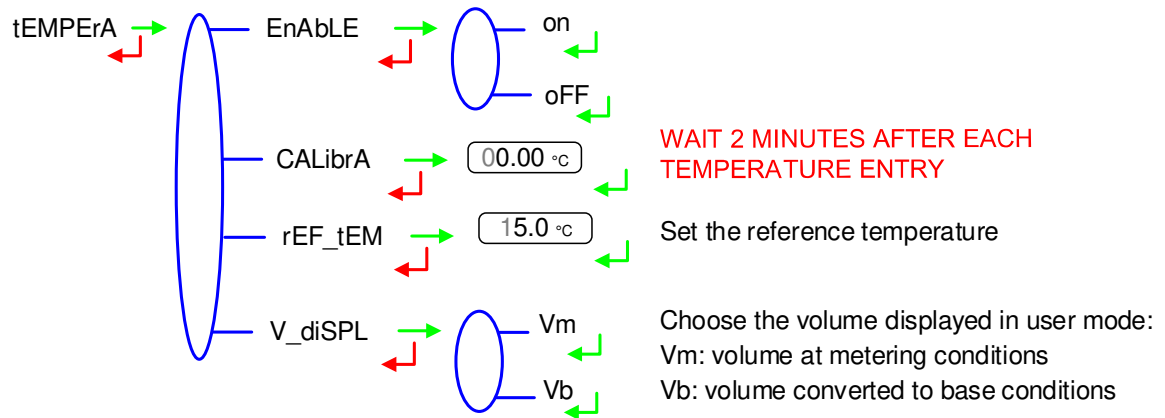
### 5.7 Menu VOLUMES – VoLuME



### 5.8 Menu TEMPERATURE – tEMPErA

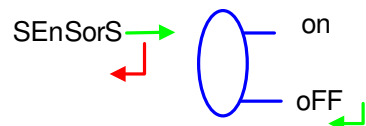
The temperature calibration can be done either on two measuring points or on a single measuring point (menu CALibrA). See maintenance sheet FM 8509.

- Two temperature measuring points:  
The measure must be done outside the range -20 to +50°C. First point at  $t < -20^{\circ}\text{C}$ , second point at  $t > +50^{\circ}\text{C}$ .
- Single temperature measuring point:  
The measure must be done in the range -20 to +50°C.



### 5.9 Menu GAS SENSORS – SEnSorS

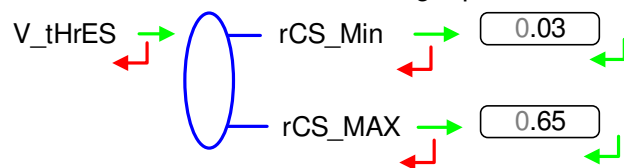
Not applicable



Validate **SEnSorS** → **oFF**

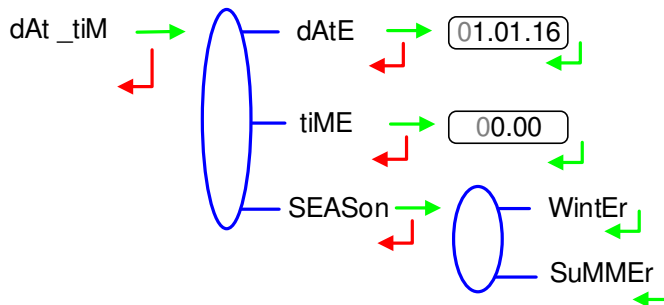
### 5.10 Menu THRESHOLDS – V tHrES

Detection thresholds of metering inputs at zero flow and at maximal flow.



### 5.11 Menu DATE AND TIME – dAt tiM

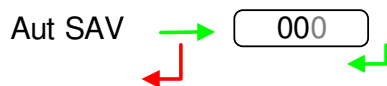
This menu is used to set date and time of the day and select the season. The menu SuPERVi>SEASon of USER mode can also be used to change from summer to winter time (and back again).



When you validate the season, 'dEL yES' then 'dEL Ok' appear to indicate that the measurement results have been deleted from flash memory.

### 5.12 Menu AUTOMATIC RECORDING – Aut SAV

Set the time required at the end of measurement before automatic recording of the measurement data (in seconds). A value other than zero disables the RAZ key. Manual reset is no more possible.



For example, the parameter Aut SAV can have the values below:

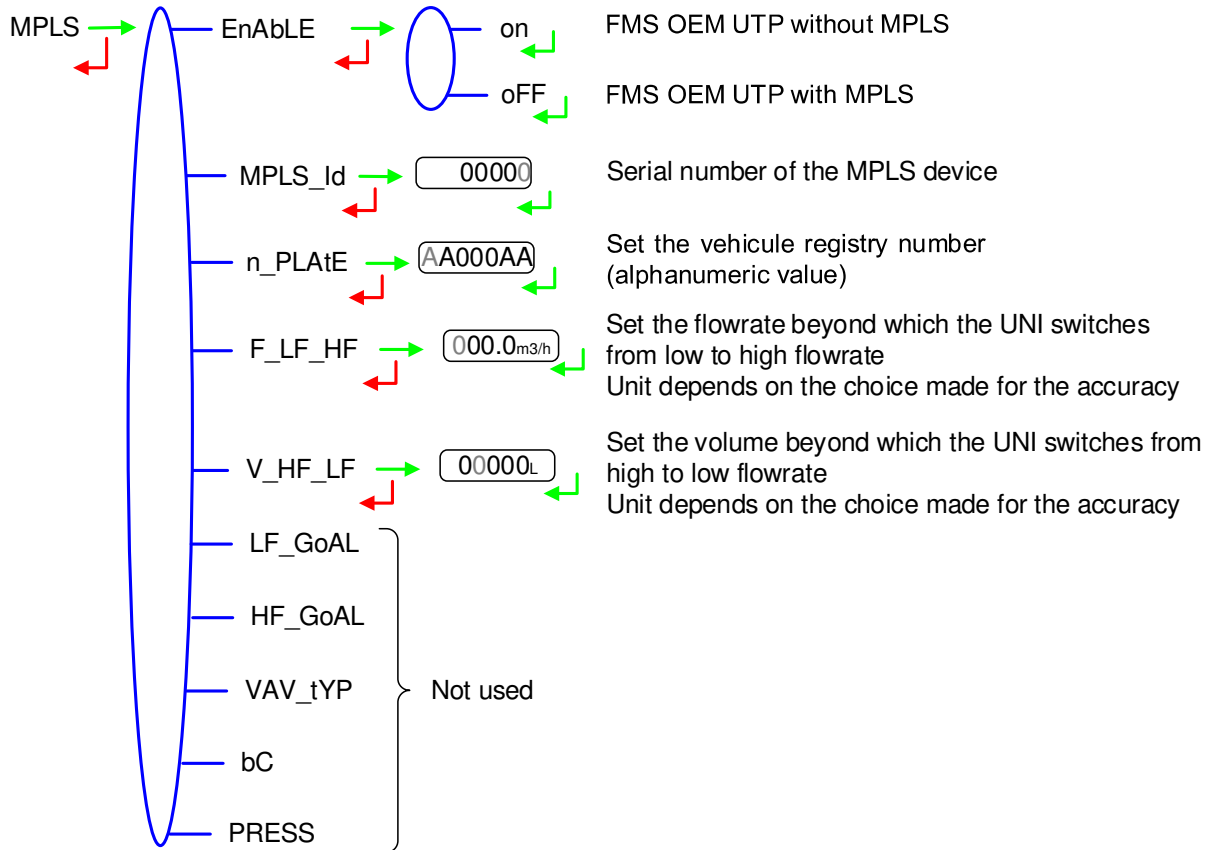
- FMS OEM UTP without MPLS:
  - Aut SAV=000. Automatic recording with RAZ
  - Aut SAV=060. Automatic recording with time-out 60 seconds
- FMS OEM UTP with MPLS: no impact.

### 5.13 Menu MPLS – MPLS



Don't activate this menu for the FMS OEM UTP without MPLS: validate EnAbLE→oFF

Activate this menu for the FMS OEM UTP with MPLS: validate EnAbLE→on



## 6 MAINTENANCE



Any intervention with broken seals must be carried out by an approved person and under the control of the competent authorities or of one of its representatives. See the certificate of the measuring system and the regulations in force.

**ANNEX**

Delivery ticket for measuring system with MPLS connected to a printer.

|                                                                                                                                                                              |             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Installation:                                                                                                                                                                | AA09C01     |
| Indicateur/Indicator:                                                                                                                                                        | 0000000123  |
| Date (../MM/20..):                                                                                                                                                           | 20/11/2018  |
| Quantieme/Calendar:                                                                                                                                                          | 324         |
| Numero/Number:                                                                                                                                                               | 009         |
|                                                                                                                                                                              |             |
| Heure de fin/<br>End time:                                                                                                                                                   | 17:16       |
|                                                                                                                                                                              |             |
| Produit/Product:                                                                                                                                                             | GAZoLE      |
| Quantite livree/<br>Quantity delivered:                                                                                                                                      | 0000299 (L) |
|                                                                                                                                                                              |             |
| Totalisateur/Totalizer:                                                                                                                                                      |             |
| Index avant/before:                                                                                                                                                          | 0015673     |
| Index apres/after:                                                                                                                                                           | 0015972     |
|                                                                                                                                                                              |             |
| En cas de litige, les resultats de mesurage<br>memorises par l'indicateur font foi. In case<br>of dispute, the measurement results stored<br>by the indicator are authentic. |             |

## RELATED DOCUMENTS

|         |                                                                                      |
|---------|--------------------------------------------------------------------------------------|
| GU 7112 | Operating guide                                                                      |
| GU 7110 | Operating guide: Transfer the measurement results of the UNI indicator to a computer |
| MV 5016 | Verification Manual                                                                  |
| FM 8009 | Replacement of the batteries of the UNI indicator device                             |
| FM 8014 | Replacement of the battery on the CTD+ key                                           |
| FM 8505 | Adjustment of an ALMA measuring system equipped with a UNI indicator device          |
| FM 8509 | Adjustment of temperature in the UNI indicator device                                |