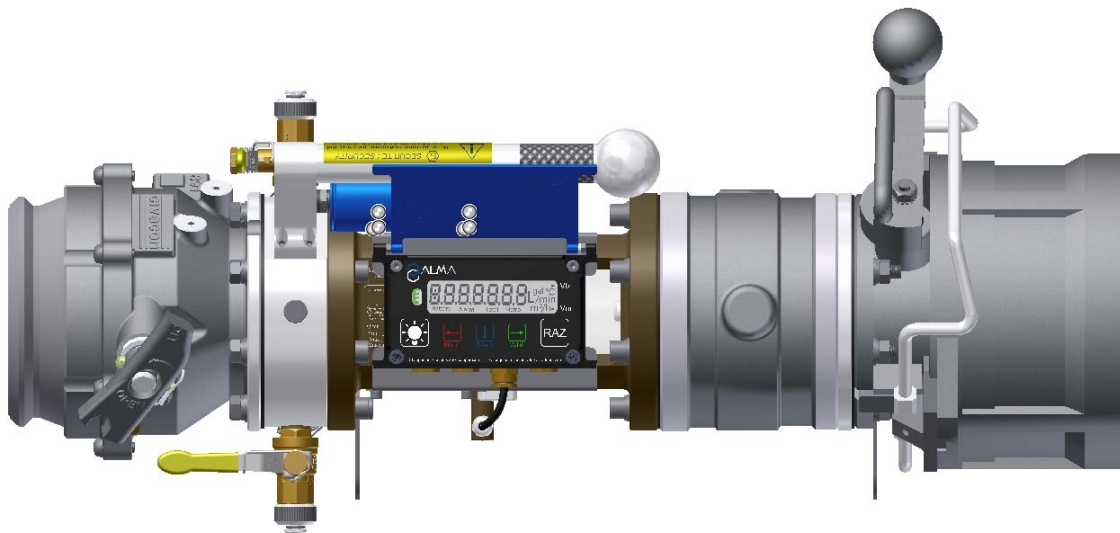



OPERATING MANUAL

MU 7065 EN F
ETALCOMPT API



Document applicable for software 444v1.03_04

F	201/01/23	Conformity with the latest software version and French issue of the manual [MDV565]	DSM	SH
D	2016/02/02	Major evolution of software: special menu for calibration campaign with validity criteria and possible recording of results	DSM	AH
C	2013/09/10	Creation	DSM	XS
Issue	Date	Nature of modifications	Written by	Approved by

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1 GENERAL PRESENTATION AND DESCRIPTION

The ETALCOMPT API is a master meter enabling periodical accuracy checking (non-metrological) of metering device installed on API loading arms.

This operation must be performed by personnel previously trained in the use of this material.

Before use, check that the ETALCOMPT API is in perfect condition and that the flow-straightener is perfectly clean.

The ETALCOMPT API is made of:

- ⇒ An ALMA turbine meter with sight glass, type ADRIANE DN100-150
- ⇒ An intrinsic security indicator-calculator device, UNI type, powered by 2 lithium batteries (4 years life expectancy)
- ⇒ An ALMA 2B00 pulse emitter
- ⇒ A data transfer key CTD+ (**use it outside potentially explosive area**)
- ⇒ A 4" API coupling with check valve
- ⇒ A 4" API adaptor
- ⇒ A purge valve and air intake with automatic return to closed position
- ⇒ A protective transport suitcase

Data can be transferred to the CTD+ key: parameters, measurements results (CRM), calibration results (CRE) and gauge calibration results (CRJ). Then, files may be downloaded from the key to a PC through USB cable. See ANNEXE.

On the front of the electronic indicator-calculator UNI, you can see five buttons:



Light the display during 10 seconds



Normal mode: return to previous menu
METROLOGICAL mode and Supervision: increment the flashing figure when imputing a value or return to previous menu



Normal mode, metering off: select the menu
Normal mode, metering on: display the immediate flow
METROLOGICAL mode and Supervision: select the figure to be modified or the menu




Normal mode: validate the selected menu or value
METROLOGICAL mode and Supervision: validate the displayed value or validate the selected menu

In case of default: acknowledge the default



Reset the volume to zero before a new measurement. The data of the last measurement are then recorded

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2 REQUIREMENTS OF USE

2.1 General

The ETALCOMPT API must always be transported in the transport case provided by ALMA.

It is recalled that in addition to the general precautions, the permanent wearing of Personal Protective Equipment is mandatory during its use (fireproof and anti-static cover clothing, suitable gloves, and eye protection goggles).

The use of any non-ATEX electronic device in the safety area is prohibited.

2.2 Restriction on use

The ETALCOMPT API must be used with measuring systems equipped with piston control valve such as BROOKS, BRODIE, SATAM XAD 36 etc.

With other kind of control valves, such as butterfly, eccentric or CAMFLEX ones, precautions must be taken to ensure that the valve is 100% open at its operating flow to avoid any risk of cavitation in the ETALCOMPT API.

The ETALCOMPT API must only be used to control the usual operation flow that must be included between 50 and 150 m³/h.

3 PREPARATION

3.1 Materials

For the initial control of the ETALCOMPT API at the beginning of a control campaign, it is necessary to have the following equipment:

- A reference standard gauge equipped with a dip tube and adapted to the API loading. It must be in line with national standards and have a valid calibration certificate
- Bronze spanner wrenches for snap coupling,
- An explosion-proof hammer,
- A thermometer calibrated by a laboratory accredited by an organisation member of ILAC with its valid calibration certificate,
- A class II rule,
- A timer.


3.2 Preliminary control of the ETALCOMPT API

3.2.1 Visual control

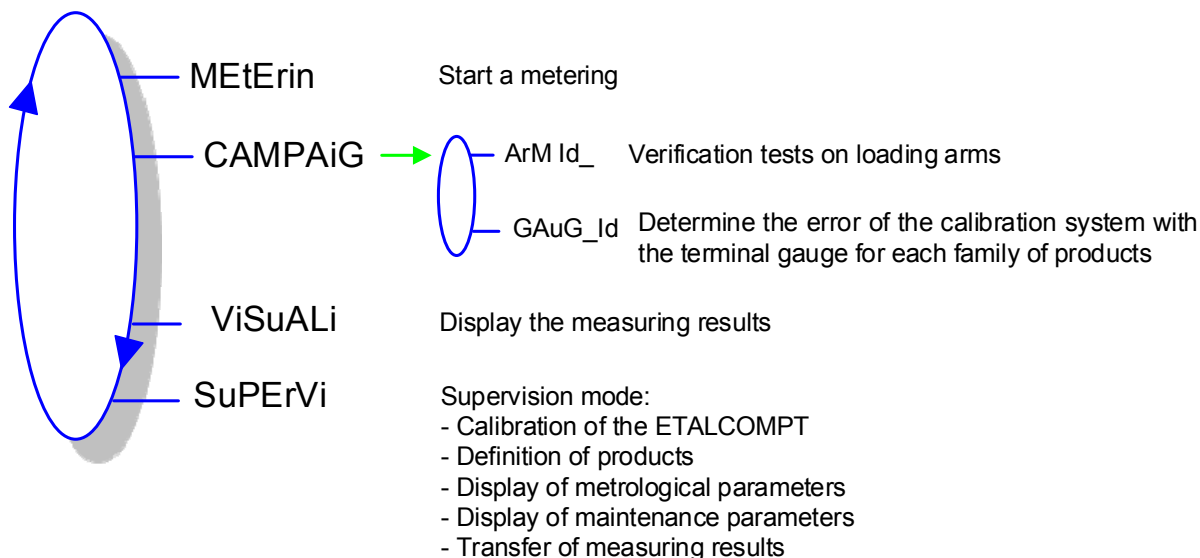
Before use, check the ETALCOMPT API operating condition. Then, make sure that the purge and air intake valves are in closed position.

3.2.2 Control of the gauge

Start with the control of the ETALCOMPT API for each family of products (distillate and/or petrol). The correction found out will be applied for summarising results with the Excel file 'Verification table of measuring system with an ETALCOMPT API' ('MU 7065 FR_EN.xls').

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4 OPERATION



The arrow located next to 'Vm' on the right of the display screen is used to indicate that the displayed volume is the volume in metering conditions:



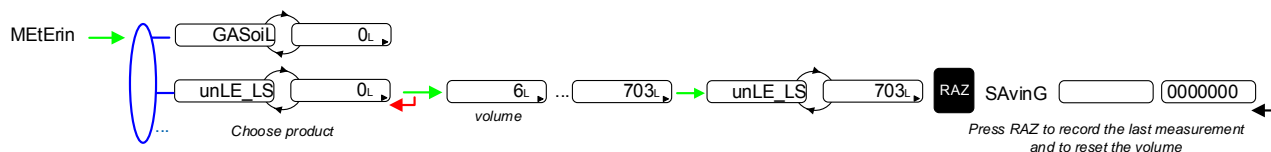
Use the Menu button to display flow rate during measuring (flow>0). Display returns automatically to the current volume.

4.1 Menu METERING – MEtErin

Measurement results are gross values according to the product family.

The measurement results may be recorded manually in the Excel file 'Verification table of measuring system with an ETALCOMPT API' ('MU 7065 FR_EN.xls').

At the end of measurement, press RAZ to record the last measurement and to reset the volume.



4.2 Menu CAMPAIGN – CAMPAiG

Series of measures on a loading arm for petrol and/or distillate. Apply the correction coefficient if needed.

4.2.1 Verification of the ETALCOMPT API with a standard gauge – Menu GAuG_Id

The menu GAuG_Id is used to find the error of the ETALCOMPT API from the gauge for each family of products (distillate and/or petrol)

4.2.1.1 Preparation of the verification

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- Check that the calibration certificates of the gauge and the thermometer are not out of date.

4.2.1.2 Installation of the gauge

- Move and position the gauge (the gauge must be empty),
- Activate the hand brake or position props,
- Before use, check the gauge operating condition: no visible shock, the valve and the viewing window must be sealed with the calibration body mark.
- Check the seat of the gauge thanks to the spirit level. Level it if necessary,
- Connect the gauge to the ground thanks to the proper device,
- Check the glycerine level in the temperature well, refill if necessary. Install the thermometer,
- Install the ETALCOMPT API on the gauge API adapter.

4.2.1.3 Conditioning of the gauge

Fill the standard gauge and then empty it completely. The ETALCOMT API is then also filled as well as the gooseneck:

- Close the gauge drain valve carefully,
- Close the drain pipe of the gooseneck,
- Follow the loading procedure of the site and start loading at nominal flow and nominal capacity of the reference gauge,
- Check the tightness of the gauge drain valve: the drain hose must be disconnected unless the gauge has a flow visualization device downstream the valve. In case of any leakage, stop the calibration and properly close the valve or replace it.

In this case, a new calibration of the gauge is mandatory; the verification is then adjourned.

4.2.1.4 Draining of the gauge

Make sure that the gauge is empty by controlling the window downstream the valve. Then remove the hose, wait for the end of draining until drops and count up to 30 (provide a spillage tray).


4.2.1.5 Write down the gauge temperature

Before and after each test, write down the gauge temperature: temperature of the empty gauge before the test and temperature of the full gauge after the test. The temperature difference should be less than 5°C. Otherwise repeat the conditioning of the gauge.

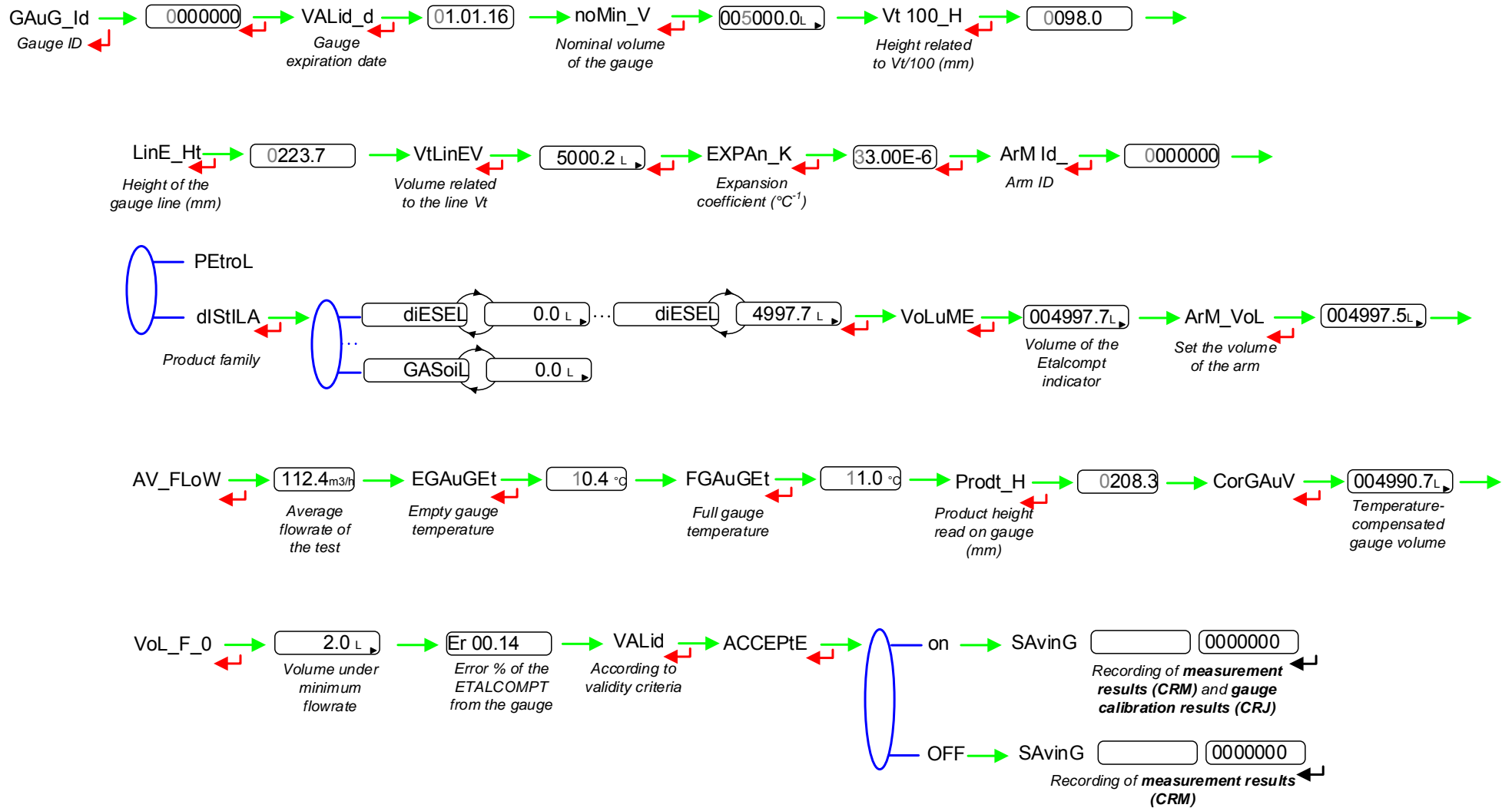
4.2.1.6 Calculation of the error

For each measure, follow the indications below:

- Make sure the gauge drain valve is closed
- Write down the temperature of the empty gauge thanks to the calibrated thermometer
- On the loading station, adjust the flow and preset the volume of the gauge
- Respect the requirements of use
- Set the following values:
 - The gauge identifier
 - The expiration date of the gauge
 - The nominal volume of the gauge

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- The height related to V/100 (mm)
 - The height of the gauge line (mm)
 - The volume related to the gauge line V_t
 - The expansion coefficient of the gauge ($^{\circ}\text{C}^{-1}$)
 - The arm identifier
- Start loading
 - Look out of the sight glass the liquid appearance throughout the test: it must be clear. In case of cloudy appearance or in case of presence of air bubbles, stop the test
 - When loading is off, set the values:
 - The volume of the gauge in tenth of litres
 - The temperature of the empty gauge noted previously
 - The temperature of the gauge thanks to the calibrated thermometer
 - When the liquid is degassed and its level stable, write down the height of liquid in the gauge: use the rule to measure the gap between the bottom of the window, with the gauge identification plate, and the liquid level (bottom of the curved meniscus region of the liquid)
 - The UNI calculates the following values:
 - The average flowrate of the test
 - The temperature-compensated volume of the gauge
 - The volume measured at a flowrate lower than the ETALCOMPT API minimum flowrate value. If it's greater than the value V_{q_Min} , set in METROLOGICAL mode, the measure should not be validated.
 - The error of the ETALCOMPT API from the gauge
 - According to criteria set in METROLOGICAL mode, the test is validated or not. It is possible then to save the measurement results (CRM) only or measurement results (CRM) and gauge calibration results (CRJ). In both cases, the volume is set to zero.
 - Empty the gauge following the draining procedure.



4.2.2 Verification tests on loading arms – Menu ArM Id_

This menu ArM Id_ is used to perform verification tests to check the error of a meter.

4.2.2.1 Installation of the ETALCOMPT API

- Important: the ETALCOMPT API must be full of product without any air bubble. The product must be the one used for verification in order to avoid the mixing of products. By this way, the whole counted product quantity will be moved in the tanker.
- Plug the ETALCOMPT API to the tanker and connect the loading arm to the ETALCOMPT API.

4.2.2.2 Conditioning

Before starting the metrological tests, the ETALCOMPT API must be put in operating conditions in order to warm it up, by loading a tank with the product used for verification.

This must be done at the beginning of each working day or after a rather long shutdown period (30min). Otherwise there should be an uncertainty in measurement on the first result of verification.

SAFETY RULE: Never move both purge and air intake valves during product movement times to prevent product splashing.

4.2.2.3 Control of loading arm

If possible, make two measures at usual operating flow for each measuring system.


Tests will be done on the largest possible volume. Minimum volume=2000 litres.

For each measure, follow the indications below:

- The ETALCOMPT API must be in 'CAMPAiG' mode displaying the product used for verification
- Start loading
- Write down the instantaneous flow Q and check that:
 - $G_Min_q \times Q_{Etalcompt} \leq Q_{test} \leq G_MAX_q \times Q_{Etalcompt}$
 - $Min_FLo \leq Q_{test} \leq MAX_FLo$

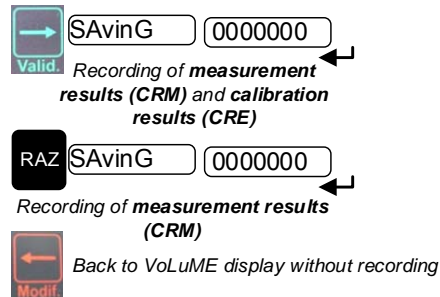
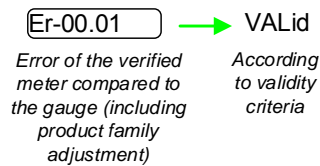
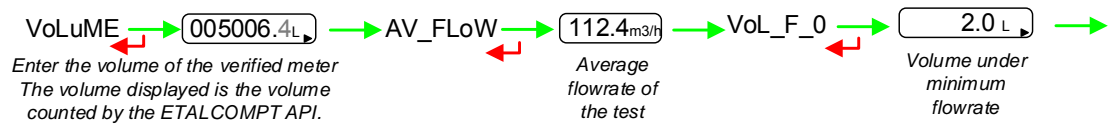
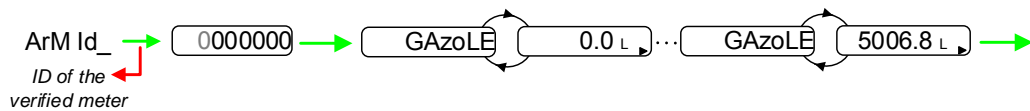
With G_Min_q, G_MAX_q, Min_FLo and MAX_FLo: criteria set in METROLOGICAL mode

$Q_{Etalcompt}$ is the ETALCOMPT calibration flowrate.
- Look out of the sight glass the liquid appearance throughout the test: it must be clear. In case of cloudy appearance or in case of presence of air bubbles, the measure should not be validated
- Check the flow displayed on the ETALCOMPT: the value must be close to the usual operating flow. If the different is too important, the measured error may be not significant
- When loading is off:
 - The UNI displays down the volume in tenth of litres, write down the volume in tenth of litres displayed on the loading arm meter device (if possible)
- The UNI calculates the following figures:
 - The average flowrate of the test
 - The volume measured at a flowrate lower than the ETALCOMPT API minimum flowrate value (volume counted the minimum flowrate between the

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opening and the closing of the control valve). If it's greater than the value V_q_Min , set in METROLOGICAL mode , the measure should not be validated

- L'erreur du compteur vérifié
- According to the criteria set in METROLOGICAL mode, the test is valid or not
 - Press BP2 Valid. to record **measurement results (CRM)** and **calibration results (CRE)** and to reset the volume
 - Press BP1 RAZ to record the **measurement results (CRM)** and to reset the volume
 - Press BP4 Modif. to return to the volume-input step without recording.
- Make a second measure if necessary.



4.2.2.4 Disconnection of the ETALCOMPT API

The disconnection of the tank requires special attention. Follow the chronological order indications described below:

- Disconnect the loading arm from the ETALCOMPT API
- Close the valve of the ETALCOMPT API coupler without activating the independent interlock mechanism
- Place the spillage retention tray under the ETALCOMPT API purge valve
- Open the purge valve and then open gradually the air inlet valve. The product is pouring; wait for the end of pouring until drops, then close both valves
- Disconnect the ETALCOMPT API from the tanker.

4.2.2.5 End of control

If the error determined on two consecutive tests is different by more than 0.05%, the result of these measures should not be validated.

Measurement results can be transferred to the CTD+ key. Transfer is possible when flow rate is zero.

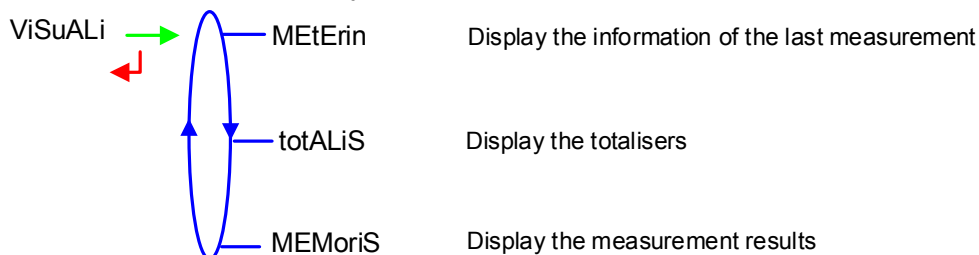


Since the CTD+ key is not ATEX, this operation must be done outside potentially explosive area.

The menu SuPErVi>trAnSFr is used to set the number of days for the transfer of the files to the key.

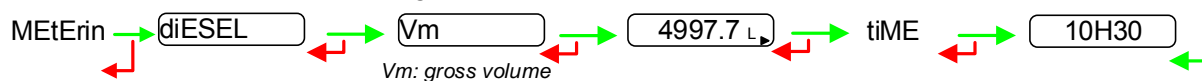
4.3 Menu VISUALISATION – ViSuALi

This menu allows to display measurement results and totalisers.



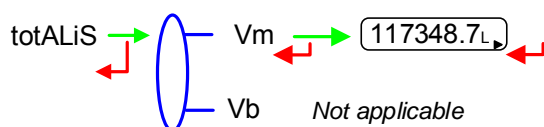
4.3.1 Sub-menu LAST METERING – MEtErin

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



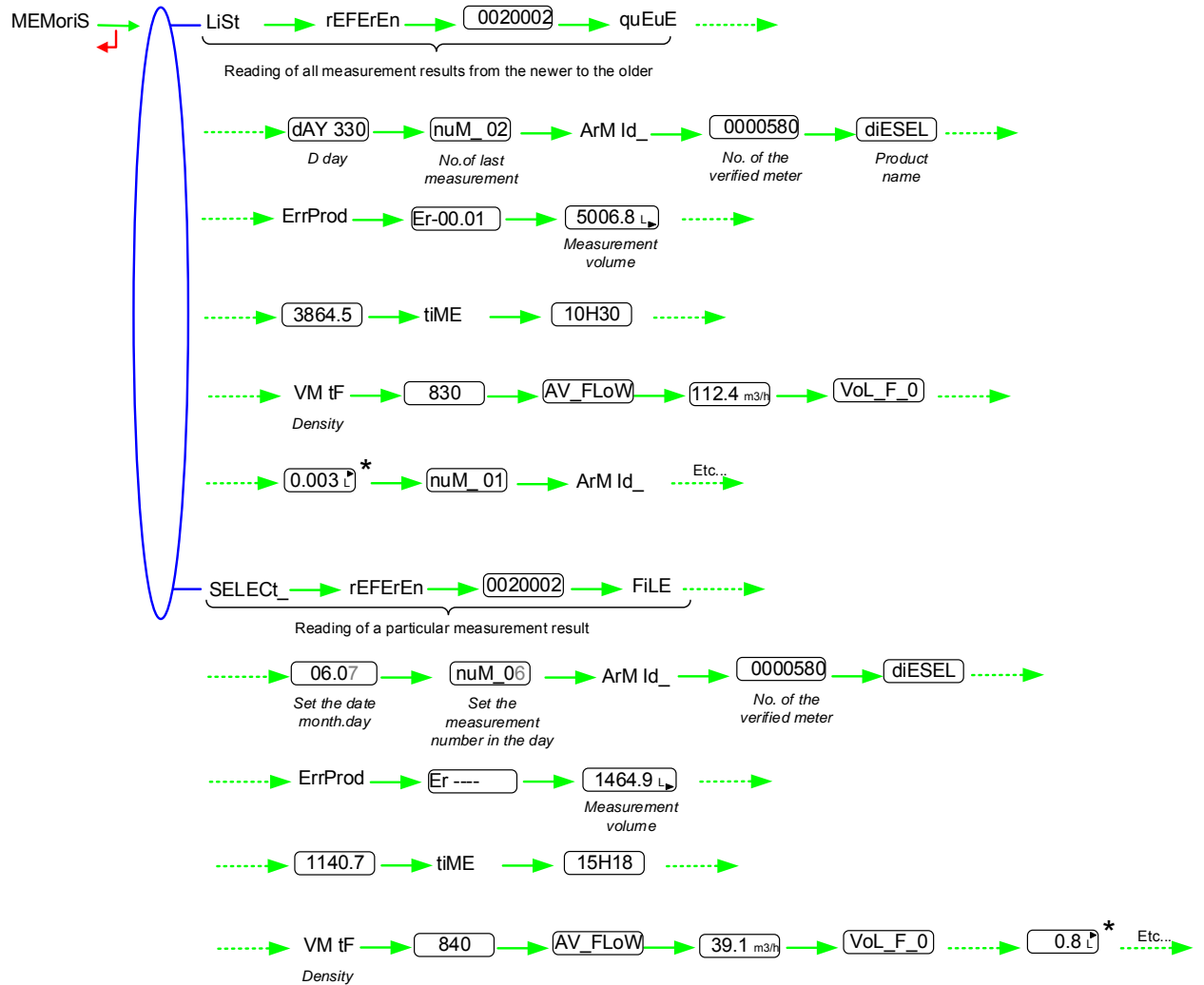
4.3.2 Sub-menu TOTALISERS – totALiS

This menu displays the totaliser of volume in metering conditions.



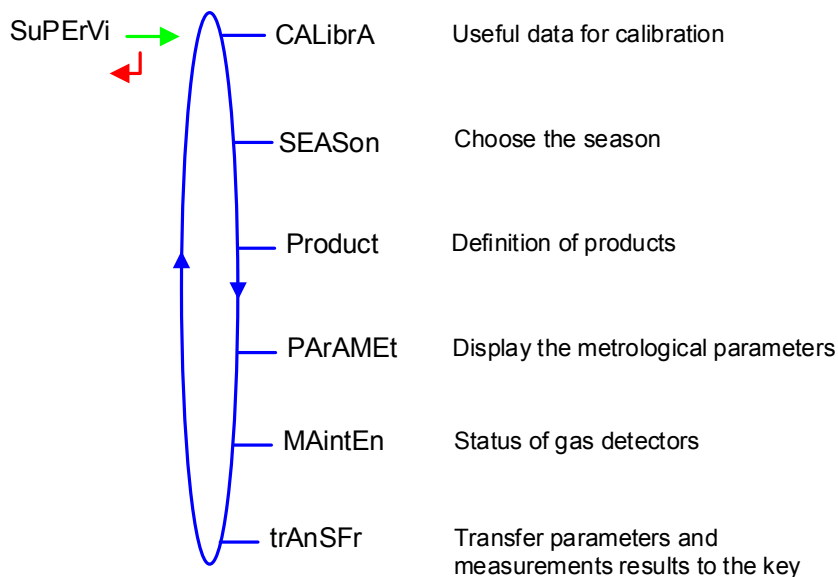
4.3.3 Sub-menu MEMORISATION – MEMoriS

This menu displays the measurements results.



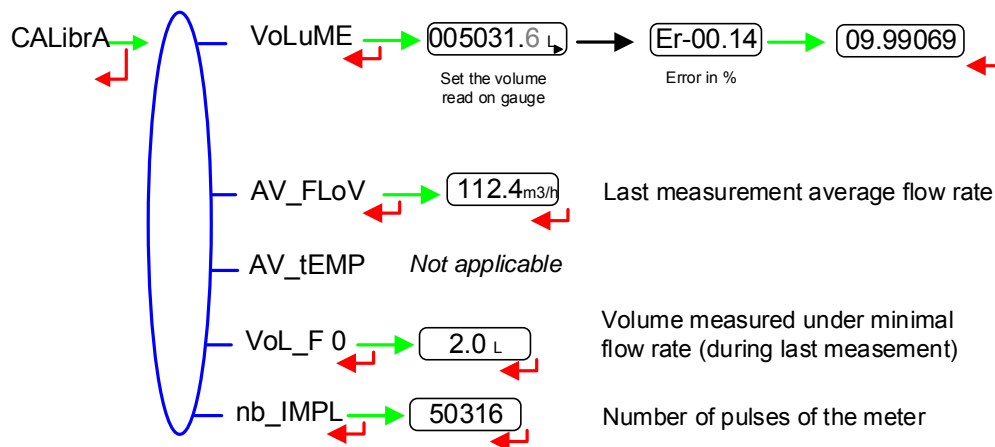
* The values may be preceded by this display: -----
 Its means they are no longer guaranteed

4.4 Menu SUPERVISION – SuPERVi



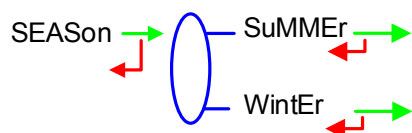
4.4.1 Sub-menu CALIBRATION – CALibrA

This menu is available after a measurement sequence to calibrate the API ETALCOMPT. It is used during the verification of the instrument exclusively when it's connected to calibration means on site (not used in laboratory).



4.4.2 Sub-menu SEASON – SEASon

Choose the season in order to change from summer to winter time (and back again).



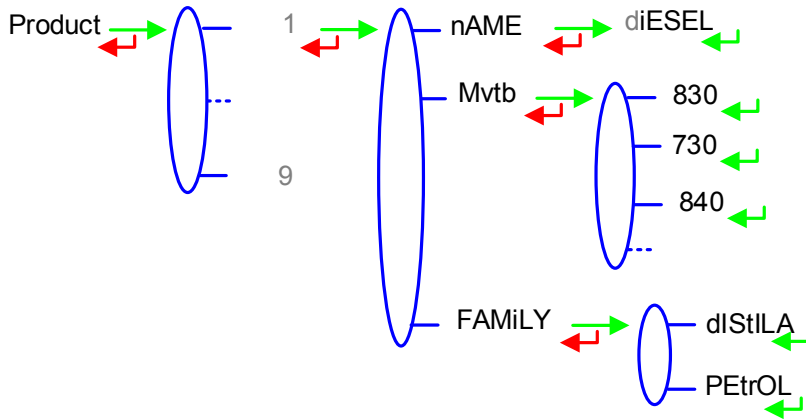
4.4.3 Sub-menu PRODUCTS – Product

Definition of products.

NAME: Enter the product name. The names set in METROLOGICAL mode are proposed by default

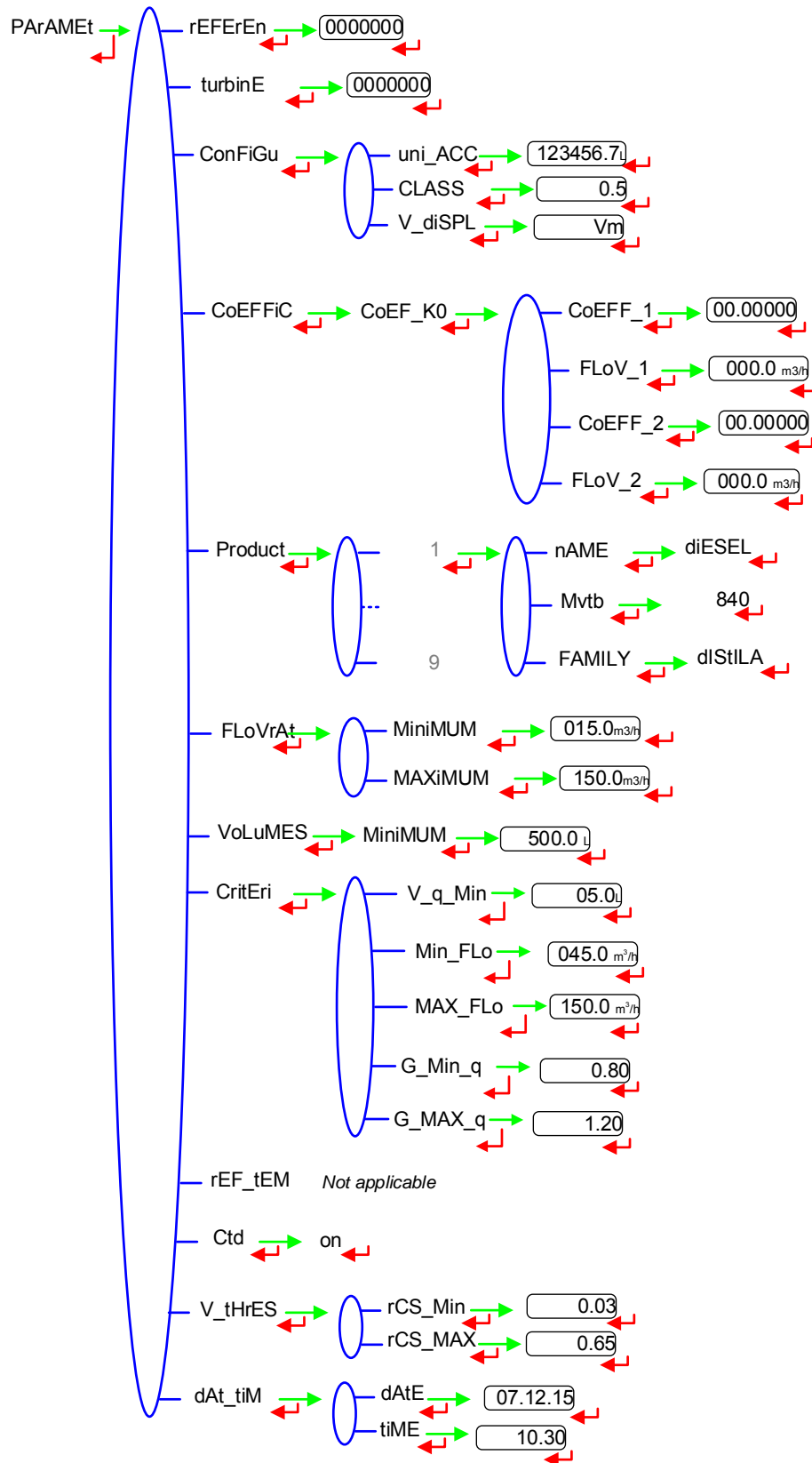
Mvtb: For information, choose the product density in base conditions. Values set in METROLOGICAL mode are proposed by default

FAMILY: Choose the family product: distillate or petrol.



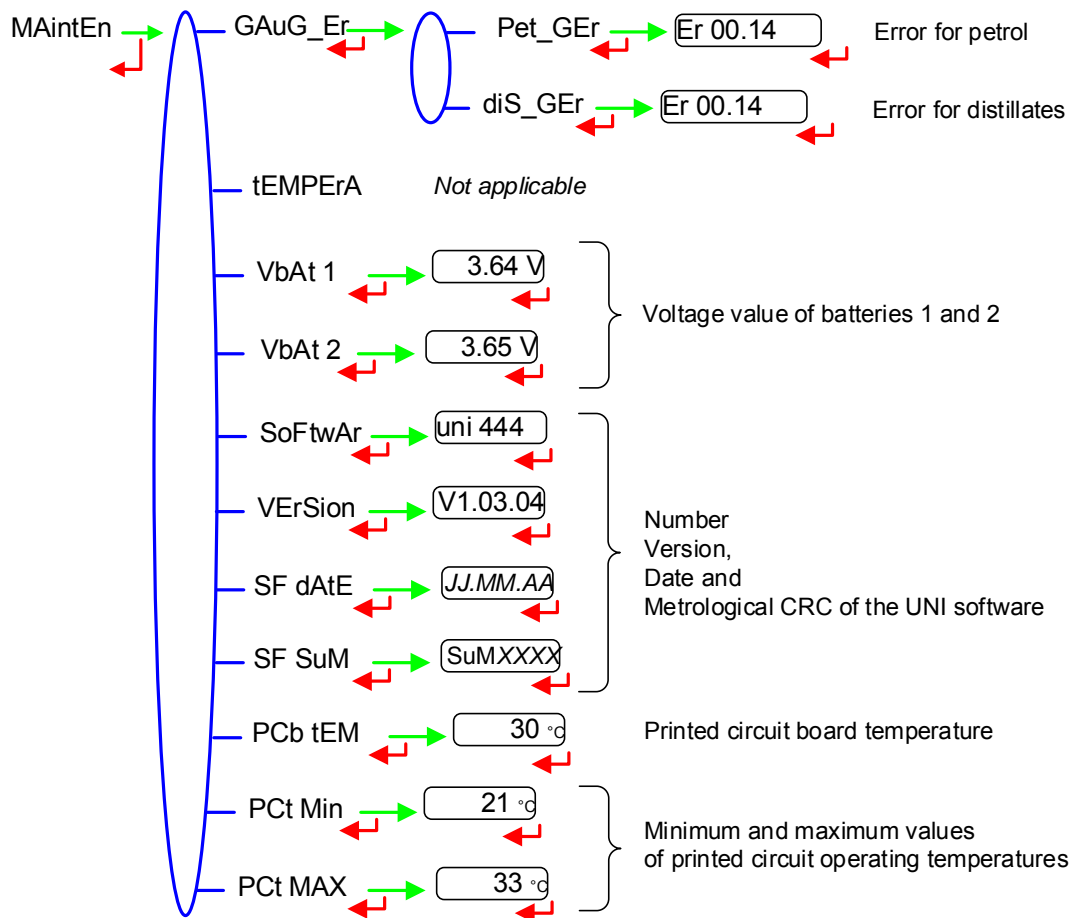
4.4.4 Sub-menu PARAMETERS – PArAMeT

This menu displays the parameters set in METROLOGICAL mode.




4.4.5 Sub-menu MAINTENANCE – MAIntEn

This menu is used to display the maintenance parameters.



4.4.6 Sub-menu TRANSFERT – trAnSFr

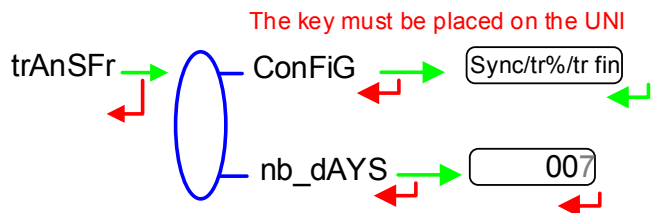
 Since the CTD+ key is not ATEX, this operation must be done outside potentially explosive area.

This menu is used to transfer to the CTD+ key the measurement and calibration results and also the parameters set in METROLOGICAL mode.

Refer to the Operating guide GU 7110 about transferring the measurement results of the UNI indicator device to a computer.

CONFIG: Transfer the parameters and the measurement results to the key

NB_DAYS: Set the number of days N for the transfer of the measurement results. If N=7, the measurement results of the last 7 days will be transferred.



5 EXPLOITATION OF RESULTS

Once the results are transferred to the CTD+ key thanks to the menu SuPErVi>trAnSFr described above, data can be used on a PC. Refer to the Operating manual MU 7076 and Annexe.

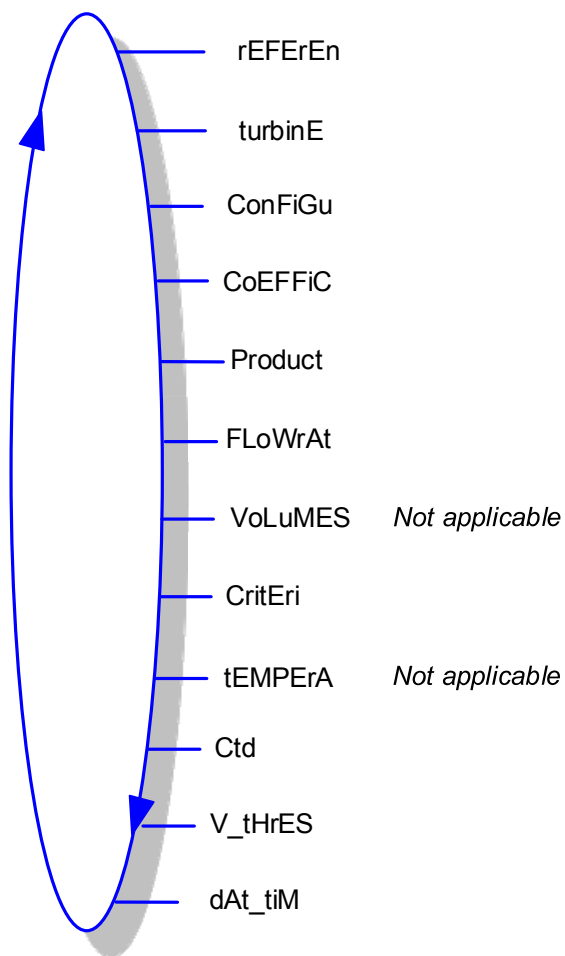
At the end of the control campaign, the verification table data can be analysed.

If the error is greater than the tolerance, an adjustment of the controlled meter is required. It has to be done by an authorized person.

In case of any doubt about results (unlikely dispersion for example), carry out again the control of the ETALCOMPT API with the standard gauge in accordance with §4.2.1.

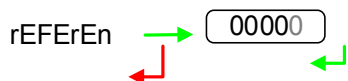
If the drift relative to the initial control is greater than 0.05%, the results of the control campaign should not be validated.

6 METROLOGICAL CONFIGURATION



6.1 Menu REFERENCE – rEFErEn

Set the serial number of the electronic calculator-indicator UNI.

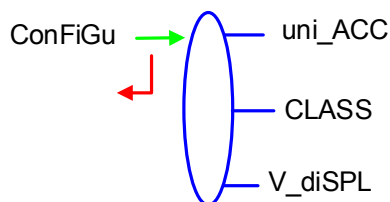


6.2 Menu TURBINE – turbinE

Set the serial number of the turbine meter.

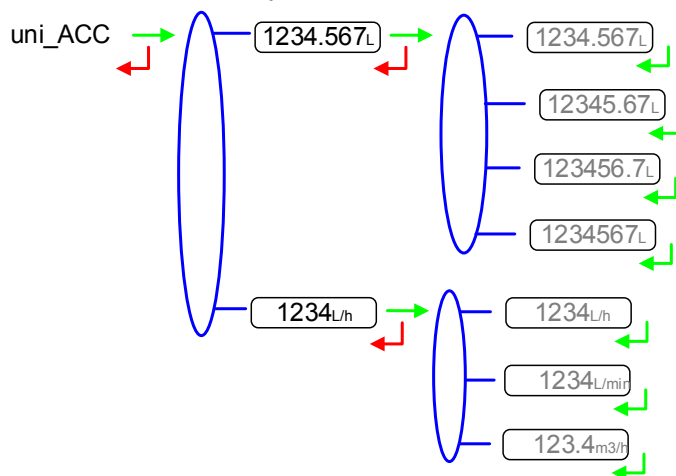


6.3 Menu CONFIGURATION – ConFiGu



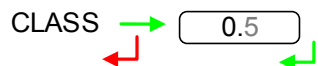
6.3.1 Sub-menu UNIT AND ACCURACY – uni_ACC

Choose the accuracy and unit of the flow rate that will be displayed and printed.



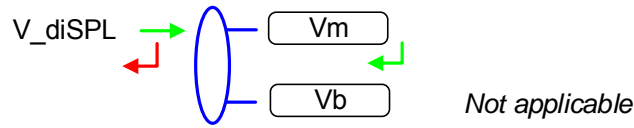
6.3.2 Sub-menu CLASS – CLASS

This menu is used to choose the accuracy class of the measuring system.

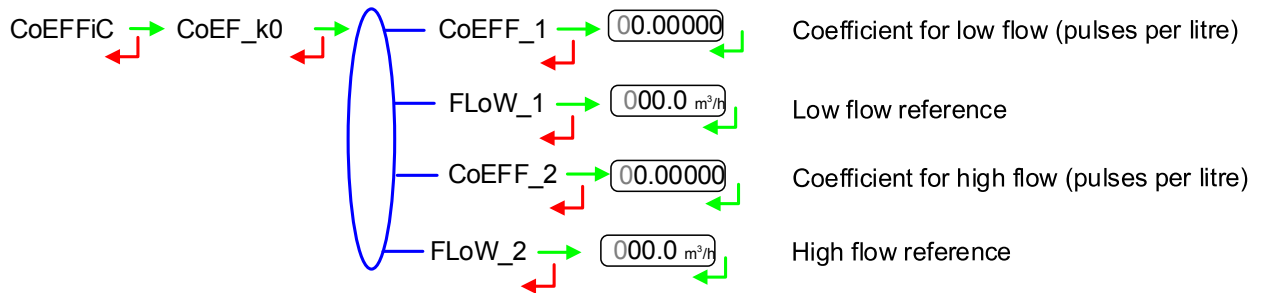


6.3.3 Sub-menu VOLUME DISPLAY – V_DISPL

Choose **V_diSPL**→**Vm** to display the volume in metering conditions in USER mode.



6.4 Menu COEFFICIENT – CoEFFiC

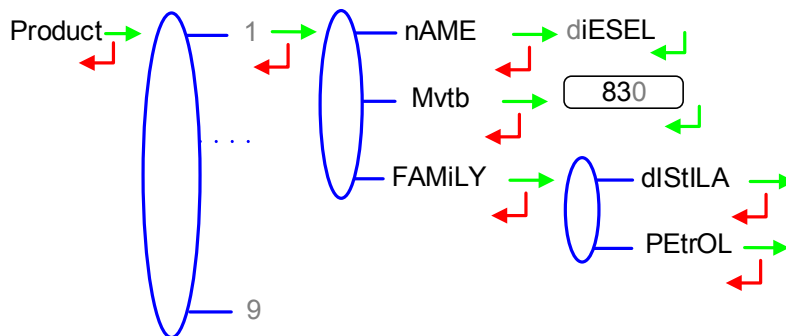


6.5 Menu PRODUCT – Product

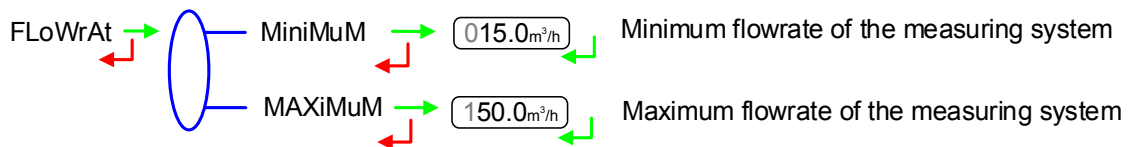
NAME: Enter the product name. The default names are proposed

Mvtb**:** For information, set in kg/m³ the product density in base conditions close to the density at 15°C of the product. Default values are proposed. Set '000' to remove the product from the list displayed in USER mode

FAMILY: Choose the family product: distillate or petrol.

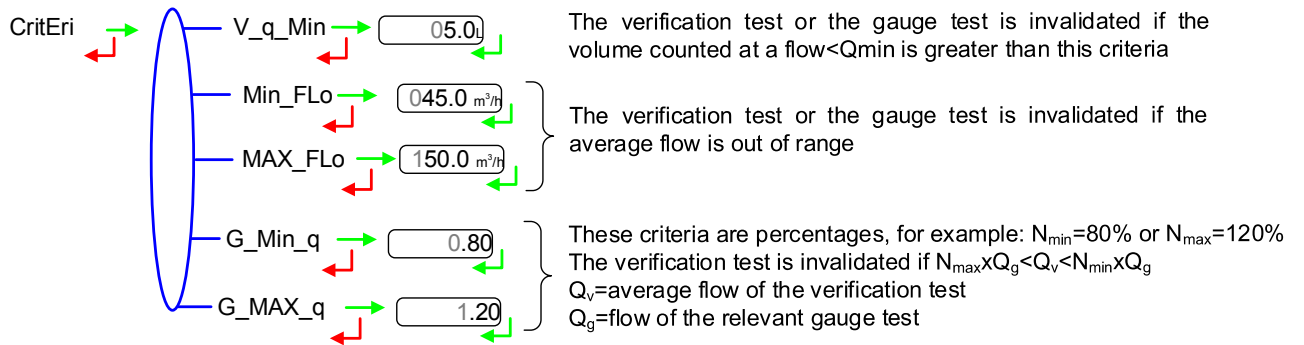


6.6 Menu FLOWRATES – FLoWrAt



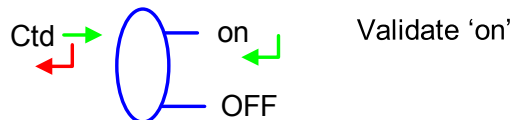
6.7 Menu CRITERIA – CritEri

This menu is used to set the criteria of validity of the verification tests to calibrate the meters.



6.8 Menu CTD+ KEY – Ctd

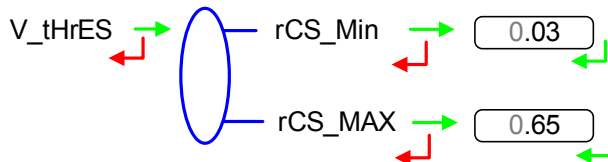
Choose **on**. The menu CAMPAIGN is available to the user. Then the ETALCOMPT API can be calibrated and verification tests can be done to calculate the meter error. Calibration results (CRE and CRJ) should be transferred to the key as well as measurements results (CRM) and parameters.



Since the CTD+ key is not ATEX, this operation must be done outside potentially explosive area.

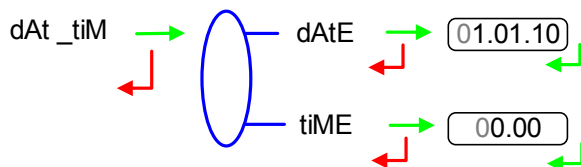
6.9 Menu VOLUME THRESHOLDS – V thRES

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



6.10 Menu DATE AND TIME – dAt tiM

Enter date and time.



ANNEXE

Files transferred to the CTD+ key.

Verification table of measuring system with an ETALCOMPT API: 'API0030003.xls'

ALMA		TABLE OF VERIFICATION OF API MEASURING SYSTEMS WITH AN ETALCOMPT API													N°1101 rev.3 2016/02/25		
Site:		Gauge identification:		1340000		End of validity:		01/01/2017		Nominal volume:		5000 L		Height for Vt100:		97 mm	
Customer:		Height of the line:		223 mm		Volume at Vt line:		5000,3 L		Expansion coefficient:		3,30E-05		°C ⁻¹			
Address:		Calculation of the ETALCOMPT API error regarding to products:															
Date	Time (hh:mm)	Family	Product	Arm identification	Arm volume (L)	Arm error / gauge (%)	Empty gauge temperature (°C)	Full gauge temperature (°C)	Product height (mm)	T corrected gauge volume (L)	Etalcompt volume (L)	Average flow rate (m3/h)	Under Glim volume (L)	Etalcompt error / gauge (%)	Observations		
10/03/2016	17:24	PETROL	PEtOL	3220000	4395,7	0,01	10,4	11	216	4395,2	4396	80,3	0	0,02			
10/03/2016	17:03	DISTILLATE	GAsoL	3210000	4391,4	-0,05	10,4	11	213	4393,7	4391	80,3	0	-0,05			
Date	Time (hh:mm)	Loading arm	Product	Product family	Arm indicator volume (L)	Etalcompt volume with family correction (L)	Family correction used (%)	Average flow rate (m3/h)	Volume measured under minimum flow rate (L)	Flow rate < %gauge flow rate or Flow rate > %gauge flow rate	Arm / Etalcompt calculated error without family correction (%)	Arm / gauge calculated error with family correction (%)	Observations				
10/03/2016	17:52	25SP000	PEtOL	PETROL	2146,7	2146,4	0,02	80,2	1,2		-0,01	0,01					
10/03/2016	17:47	12Go000	GAsoL	DISTILAT	2082,7	2082,5	-0,06	80,2	1,5		0,06	0,01					

Measurement results CRM: 'M0030003.csv'

Day number	Measurement number	Date	Time	Arm or gauge Id	Product	Error/gauge	Measured volume (L)	Basic volume (L)	Temperature (°C)	Weight (Kg)	defaults:	DEF_MEM	DOG	OVERFLOW	METER	LOW_FLO	HIGH_FL	LF
3	70	10/03/2016	17:52	25SP000	PEtOL	+0.02	02146.4	N/A	OFF	N/A								
4	70	9/10/03/2016	17:47	12Go000	GAsoL	-0.05	02082.5	N/A	OFF	N/A								
5	70	8/10/03/2016	17:24	1340000	PEtOL	+99.99	04996.0	N/A	OFF	N/A								
6	70	7/10/03/2016	17:09	1340000	GAsoL	+99.99	04991.0	N/A	OFF	N/A								
7	70	6/10/03/2016	15:46	12di500	GAsoL	+99.99	05000.0	N/A	OFF	N/A								
8	70	5/10/03/2016	15:35	0	GAsoL	+99.99	09363.8	N/A	OFF	N/A								
9	70	4/10/03/2016	14:59	0	UnLEAdE	+99.99	00000.2	N/A	OFF	N/A								
10	70	3/10/03/2016	14:41	0	UnLEAdE	+99.99	00000.3	N/A	OFF	N/A								
11	70	2/10/03/2016	14:32	0	UnLEAdE	+99.99	01178.0	N/A	OFF	N/A								
12	70	1/10/03/2016	14:31	0	UnLEAdE	+99.99	00000.2	N/A	OFF	N/A								X

Calibration results CRE: 'E0030003.csv'

Day number	Calibration number	Date	Time	Arm Id	Product	Error/gauge	Measured volume (L)	Basic volume (L)	Temperature (°C)	Family	Average flow rate (m3/h)	Under low flow rate volume (L)	Standard volume (L)	Arm volume (L)	Arm error (%)	Not valid flow rate vs gauge	Not valid flow rate	Not valid vol. under low flow rate
70	10	10/03/2016	17:52	25SP000	PETROL	+0.02	02146.4	N/A	OFF	PETROL	80.2	00001.2	02146.4	02146.7	+0.01			
70	9	10/03/2016	17:47	12Go000	GASoil	-0.05	02082.5	N/A	OFF	DISTILAT	80.2	00001.5	02082.5	02082.7	+0.01			

@@SOFT=444&CFG=05&VER=01.03.04&LANG=EN

Gauge calibration results CRJ: 'J0030003.csv'

Day number	Calibration number	Date	Time	Gauge Id	Validity	Nominal volume (L)	Family	Average flow rate (m3/h)	Height for line (mm)	Line height (mm)	Volume at VT (L)	Expansion coefficient	Empty temperature (°C)	Full temperature (°C)	Product height (mm)	Uncorrected measured volume (L)	Corrected gauge volume (L)	low flow rate volume (L)	Compared with gauge error (%)	Not valid flow rate	Not valid vol. under low flow rate	Arm Id	Product	Volume	
70	8	10/03/2016	17:24	1340000	01/01/2017	05000.0	PETROL	80.3	097.0	223.0	05000.3	33.00E-6	+10.4	+11.0	216.0	04996.0	04995.2	00000.0	+0.02				3220000	PETROL	0499
70	7	10/03/2016	17:09	1340000	01/01/2017	05000.0	DISTILAT	80.3	097.0	223.0	05000.3	33.00E-6	+10.4	+11.0	213.0	04991.0	04993.7	00000.0	-0.05				3210000	GASoil	0499
70	*00006	10/03/2016	15:46	1261500	01/01/2017	05000.0	DISTILAT	80.3	097.0	223.0	05000.3	33.00E-6	+10.4	+11.0	223.0	05000.0	04998.8	00001.5	+0.02	X			1230000	GASoil	0500

@@SOFT=444&CFG=05&VER=01.03.04&LANG=EN

Parameters: 'P0030003.csv'

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	UNI Parameters n° 30003 edited 20190310 at 17:53															
2	UNI software version	444 V01.03.04														
3	UNI software date	25/02/2016														
4	Vm UNI totaliser	29758.4	L													
5	Vb UNI totaliser	29758.4	L													
6	UNI battery voltages	3.69	V	3.64	V											
7	UNI PCB temperatures (min. and max.)	+28.0	°C	+31.0	°C											
8	Meter serial number	5000005														
9	Volume units and precision	123456.7	L													
10	Flow rate units and precision	123.4	m3h													
11	Accuracy class	0.5														
12	Displayed volume	Measured volume														
13	K0_1 coefficient (low flow)	04.00000	pulseL	Low flow Q1	00.0	m3h										
14	K0_2 coefficient (high flow)	04.00000	pulseL	High flow Q2	00.0	m3h										
15	Rcmin (%)	0.03														
16	Rcmax (%)	0.65														
17	Produit 1	GASOIL		Masse volumique de base	830	Kg/m3	Famille	DISTILAT								
18	Produit 2	UNLE-LS		Masse volumique de base	730	Kg/m3	Famille	PETROL								
19	Produit 3	UNLEADE		Masse volumique de base	730	Kg/m3	Famille	PETROL								
20	Produit 4	DIESEL		Masse volumique de base	840	Kg/m3	Famille	DISTILAT								
21	Produit 5	PETROL		Masse volumique de base	740	Kg/m3	Famille	PETROL								
22	Produit 6	JET		Masse volumique de base	780	Kg/m3	Famille	DISTILAT								
23	Product 7	PROPANE		Basic density	515	Kg/m3	Family	PETROL								
24	Product 8	BUTANE		Basic density	585	Kg/m3	Family	PETROL								
25	Product 9	LPG		Basic density	550	Kg/m3	Family	PETROL								
26	Minimum flow rate	15.0	m3h													
27	Maximum flow rate	150.0	m3h													
28	Minimum Measured Quantity	500.0	L													
29	Under min. flow rate volume criterion	5.0	L													
30	Min. flow rate criterion	50.0	m3h													
31	Max. flow rate criterion	120.0	m3h													
32	Min. flow rate difference criterion (%)	0.80														
33	Max. flow rate difference criterion (%)	1.20														
34	Basic temperature	+15.0	°C													
35	Temperature	DIFF														
36	PT100 slope	0.007770														
37	PT100 Y intercept	89.432001	Ohm													
38	Cid+	CN														
39	@@SOFT=444&CFG=05&VER=0103.04&LANG=EN															
40																
41																
42																

Parameters of the CTD+ key: 'P00__CTD.csv'

	A	B	C	D	E
1	CTD+ USB key parameters				
2	CTD+ USB key software version	438 V01.00.08			
3	CTD+ USB key software date (mm.dd.yyyy)	06.10.2015			
4	CTD+ USB key battery voltage	3.51	V	OK	
5	@@SOFT=438&CFG=00&VER=01.00.08&LANG=EN				
6					
7					
8					
9					
10					
11					
12					

RELATED DOCUMENTS

'MU 7065 FR_EN.xls'	Verification table of measuring system with an ETALCOMPT API
GU 7110	Operating guide: Transfer the measurement results of the UNI indicator device to a computer
MU 7076	Operating manual: Excel files of master meter applications
FM 8014	Replacement of the battery on the CTD+ key