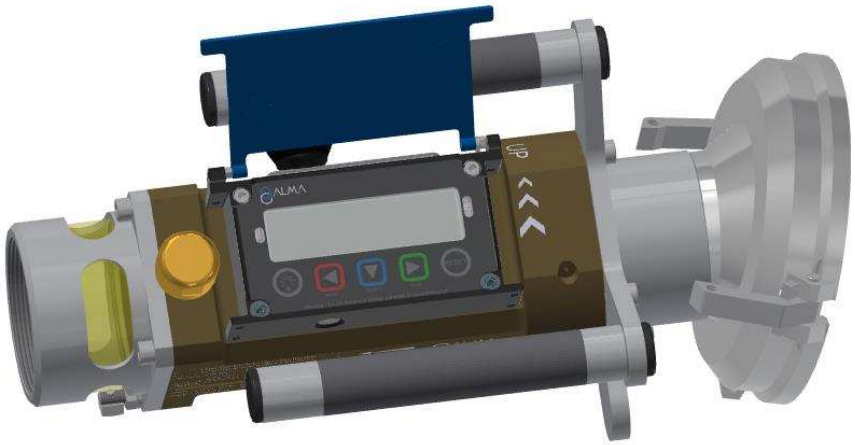
USER MANUAL

MU 7033 EN L

FLEXICOMPT AUTONOME+



Issue	Date	Nature of modifications	Written by	Approved by
L	2020/01/27	UNI-2 *[PJV158]*	DSM	SH
K	2017/10/30	Update table of alarms *[MDV568]* GU 7110 cancels and replaces FM 8012 *[MDV544]* MU 7087 Mobile printer kit non ATEX Drawings update	DSM	XS
J	2016/12/13	FA+ Adblue *[MDV465]* + Drawings update +Software improvement + recommendations for use of the key CTD+	DSM	SR
A	2010/04/29	Creation	DSM	XS

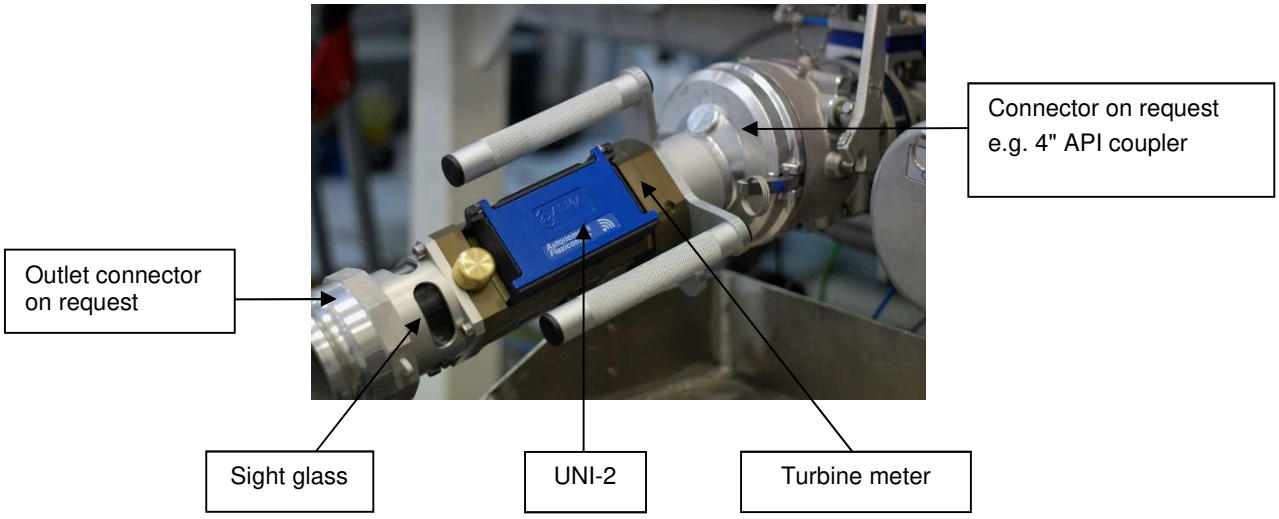
CONTENTS

1 GENERAL PRESENTATION AND DESCRIPTION

The FLEXICOMPT AUTONOME+ is a measuring system intended to the gravity measurement of products other than water on various installations. Depending on the model, it may be used for measurement of AdBlue.

The FLEXICOMPT AUTONOME+ includes:

- ⇨ An UNI-2 intrinsic security indicator-calculator device fastened to the hydraulic sleeve
- ⇨ An hydraulic sleeve which includes the elements that follow:
  - An ALMA ADRIANE turbine meter DN80-80
  - A sight glass, downstream of the turbine meter
  - A vacuum breaker valve
- ⇨ An appropriate outlet connector: a 4" coupler to connect onto the API adapter, a DN80 quick coupling to connect the unloading hose or any other connector (CAMLOCK, TODO, aviation…)
- ⇨ An appropriate unloading connector: a quick coupling to connect the unloading hose or any other connector (CAMLOCK, TODO, aviation…).



Directly coupled to the unloading valve, the FLEXICOMPT AUTONOME+ can:

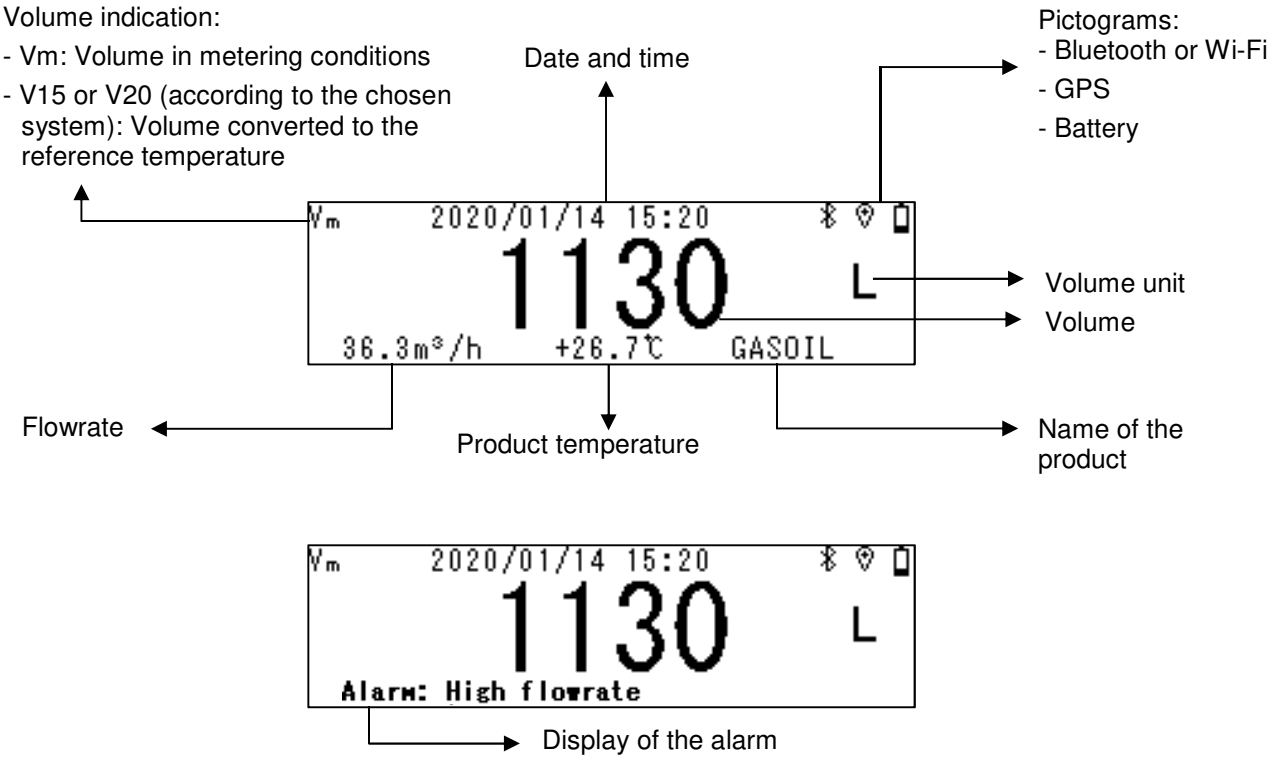
- ⇨ Measure products when they are delivered to the station
- ⇨ Monitor the reception of products (lorry/wagon)
- ⇨ Split compartments
- ⇨ Measure product returns
- ⇨ Issue tank charts
- ⇨ Manage faults
- ⇨ Communicate with an embedded computer or with a PC/tablet/portable device thanks to the wireless connection.

The optional functions are available:

- ⇨ The FLEXICOMPT AUTONOME+ can manage the product temperature. In that case, it shows volume in metering conditions or volume converted to the reference temperature;

⇨ It can be associated to a CTD+. This option is used to transfer measurements results to the CTD+ thanks to an infrared communication between the FLEXICOMPT AUTONOME+ and the CTD+. The data can be downloaded to a computer with a USB cable or to the printer kit.The metrological parameters file and the configuration file of the FLEXICOMPT AUTONOME+ can be uploaded separately in order to make an easier monitoring of the instrument (periodic inspection, identification and diagnosis). **CAUTION the CTD+ is not an ATEX device**.

The FLEXICOMPT AUTONOME+ has one display:



Meaning of the pictograms displayed in the upper right of the screen:

Bluetooth			Wi-Fi			GPS			Battery	
	blinking	steady		blinking	with signal strength					10 charge level
OFF	ON	Connected	OFF	Disconnected	Connected	OFF	ON without position	ON position OK	Charging	Battery is full charged

NOTE 1: Bluetooth and Wi-Fi connections are exclusives.

NOTE 2: To save the battery charge, if the Bluetooth or Wi-Fi connection is released if it's not successful within two minutes. If the Bluetooth or Wi-Fi connection is successful, it remains active for 10 minutes.

The FLEXICOMPT AUTONOME+ has five keys:

		Lights the display during 10 seconds
	MODIF	Normal mode: back to previous quantity Metrological mode: increment the flashing figure when imputing a value or return to previous menu
	SELECT	Normal mode, metering off: select the menu Normal mode, metering on: display the values (immediate flow, temperature) Metrological mode: select the figure to be modified or select the menu
	VALID	Normal mode: validate the selected menu or value Metrological mode: validate the displayed value or the selected menu In case of default: acknowledge the default
	RESET	The key is active when the UNI-2 is autonomous. Reset the volume to zero and record the data of the last measurement

2 CONNECTED FEATURES AND SUPPLY OF THE FLEXICOMPT AUTONOME+

	FLEXICOMPT AUTONOME+			
	Charging	Between 100% and 40%	Between 40% and 10%	Less than 10%
Metering	On *	On	On	Off
Wi-Fi	On	On	Off	Off
Bluetooth	On	On	On	Off
GPS	On	On	On	Off

 * Charge batteries outside potentially explosive area

2.1 Connected functions

The wireless connection enables the FLEXICOMPT AUTONOME+ to communicate with an embedded computer or with a PC/tablet/portable device

The connected functions of the FLEXICOMPT AUTONOME+ are:

- Incoming data flow processing
- Recovery of parameters
- Recovery of maintenance information
- Geo-tracking of each measurement, the instantaneous position of the FLEXICOMPT AUTONOME+
- Recovery of the clock

Communication modules are listed below:

- Bluetooth Low Energy 4.1 or Wi-Fi (IEEE 802.11 b/g/n (2.4GHz)

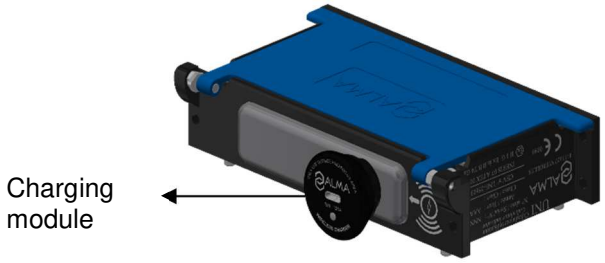
They are used for outsourcing of measurement data and parameters of the FLEXICOMPT AUTONOME+ for the customer. The customer uses a local interface that can be one of his tools or a tool supplied by ALMA. These features are exclusive.

- GPS. It is used to locate measurements and synchronize the clock again.

2.2 Power supply

The UNI-2 is powered by two rechargeable batteries. These internal batteries have a five years lifetime. The FLEXICOMPT AUTONOME+ operates with or without its charging module. It has at least one week battery life.

Use the charging module with a USB cable to charge the batteries.



To save battery life:

- The Bluetooth or Wi-Fi connection are activated manually in the menu Interfaces of the USER mode.
- The standby mode is automatic after a period of inactivity.
- The GPS switches on automatically during measurements only

To set date and time, you can switch on the GPS manually to synchronize the clock again. This operation lasts one minute and must be done outdoors. Stop GPS at the end of synchronization (menu Connect>Start GPS).

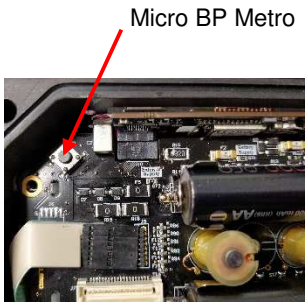
3 CONFIGURATION, SETTINGS AND CALIBRATION

3.1 Configure the FLEXICOMPT AUTONOME+

You must configure the FLEXICOMPT AUTONOME+ during commissioning and sometimes during metrological controls. Break the seals protecting the opening of the case, remove the four screws and press the micro BP Metro. See below.

Then you enter the METROLOGICAL mode. Details are available in the section CONFIGURE THE FLEXICOMPT AUTONOME+: METROLOGICAL MODE.

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



3.2 Set the FLEXICOMPT AUTONOME+

You must set the FLEXICOMPT AUTONOME+ before use. Then choose:

- Menu User>Connect to enable the possible external connections
- Menu User>Interfaces to set the active connections

3.3 Calibrate the FLEXICOMPT AUTONOME+

To calibrate the FLEXICOMPT AUTONOME+, choose the menu User>Supervisor>Calibration. To modify the coefficient, remove the seal to switch in METROLOGICAL mode.

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

4 OPERATING RECOMMENDATIONS

⇨ The operating temperature of the UNI-2 is between -20°C and +50°C.
⇨ When it is not used, it's better to close the UNI-2 cover.
⇨ The front face glass must be regularly cleaned for easy readability and better communication with the CTD+.

⇨ **Charge batteries outside potentially explosive area**
⇨ **Replace batteries outside potentially explosive area**
⇨ **Use the CTD+ outside potentially explosive area**

4.1 Mobile installation

The vacuum between the connecting device and stripping valve on the FLEXICOMPT AUTONOME+ device must be rigid with a 15 degree angle, an 80mm minimum diameter and a length of less than 80mm.

4.2 FLEXICOMPT AUTONOME+ Adblue

The FLEXICOMPT AUTONOME+ AdBlue must be rinsed with water after use in order to clean it and to ensure it works properly.

5 IGNITION AND OPERATION

The FLEXICOMPT AUTONOME+ measuring system operates with an empty hose. The operator connects it to the API adaptor and then connects the hose to the FLEXICOMPT AUTONOME+ outlet.

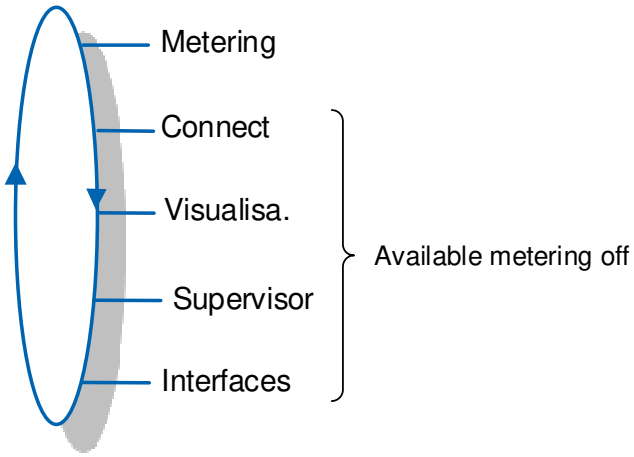
The operating procedure is as follows:

- ⇨ Reset the volume on the UNI-2. The operator opens the tank valve. The metering starts as soon as the UNI-2 records impulses coming from the turbine. The metered volume is continually displayed on the UNI-2.
- ⇨ For partial emptying:

  The operator stops metering by closing the tank valve. The metering stops when the UNI-2 notes that both gas detectors are wet and flow rate is to zero.
- ⇨ For complete emptying:

  The operating procedure is identical to the partial emptying procedure but there is no voluntary action on the tank valve.

6 USE THE FLEXICOMPT AUTONOME+: USER MODE

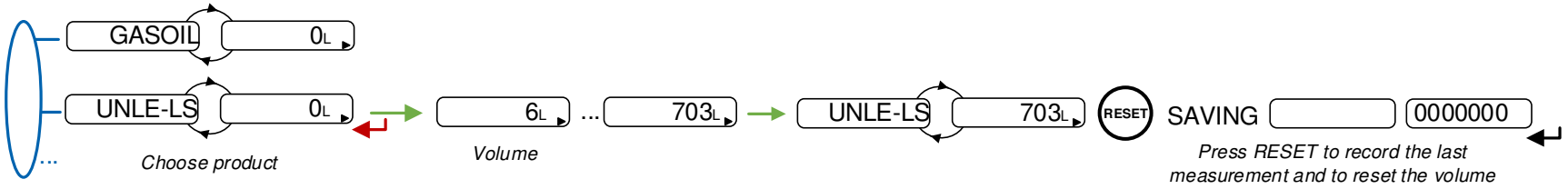


The FLEXICOMPT AUTONOME+ is on metering between the first command level after initialization or resetting the current volume to zero, and resetting the current volume to zero.

The displayed volume depends on the configuration set in METROLOGICAL mode. A pictogram at the upper left of the screen, indicates Vm for volume at temperature, or V15/V20/Vb for a volume converted to the reference temperature.

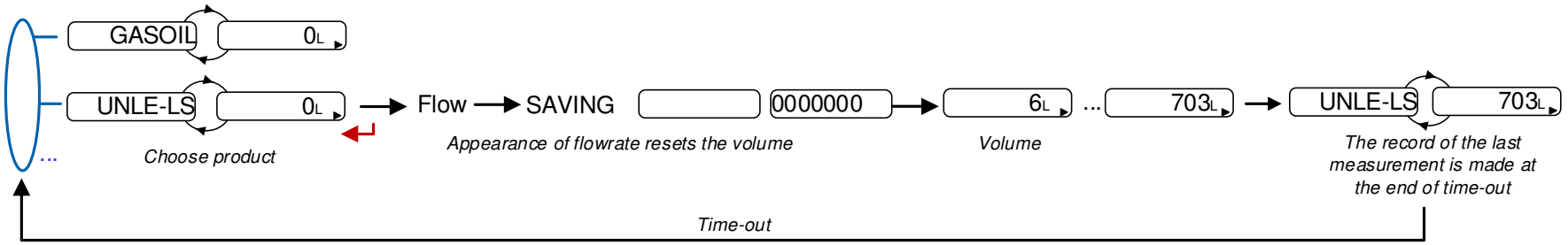
6.1 Menu Metering

The manual recording sequence starts at the end of measurement by pressing RESET. The last measurement data is then recorded and the volume is reset.



For the automatic recording sequence, the time-out is set in METROLOGICAL mode (menu Auto Save)

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



6.1.1 Data recording and volume reset

Data recording and volume reset depend on the configuration of the FLEXICOMPT AUTONOME+:

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

6.1.2 Transfer measurement results and parameters

6.1.2.1 Transfer with the INSIDE app

The INSIDE app is used to transfer measurement results and parameters. See the user manual MU 7094

6.1.2.2 Transfer with CTD+

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

When flow rate is zero, you can transfer to the key the parameters and the measurement results of the N last days. Set N in the menu User>Interfaces>CTD+

See the user guide GU 7110

The file can be downloaded to a PC at '.csv' format.

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

6.1.3 Printing

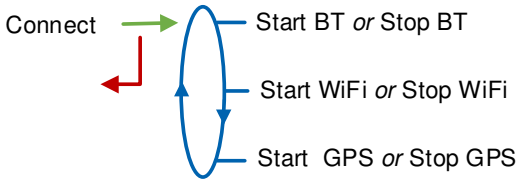
6.1.3.1 Printing with the INSIDE app

Use the INSIDE app to print the delivery ticket. This feature is used to print delivery ticket as a PDF file. See the user manual MU 7094.

6.1.3.2 Printing with the CTD+ and the mobile printer kit

Use the CTD+ and the non ATEX mobile printer kit to print the delivery ticket. See the user manual MU 7087.

6.2 Menu Connect

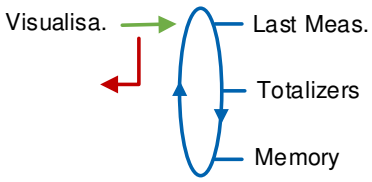


Start BT: Start or stop Bluetooth connection. The Bluetooth switches automatically to stand-by mode after two minutes of inactivity when connection is off and after ten minutes of inactivity when connection is on

Start Wi-Fi: Start or stop Wi-Fi connection

Start GPS: This menu is used to switch on the GPS manually to synchronize the clock again. This operation lasts one minute and must be done outdoors. Stop GPS at the end of synchronization.

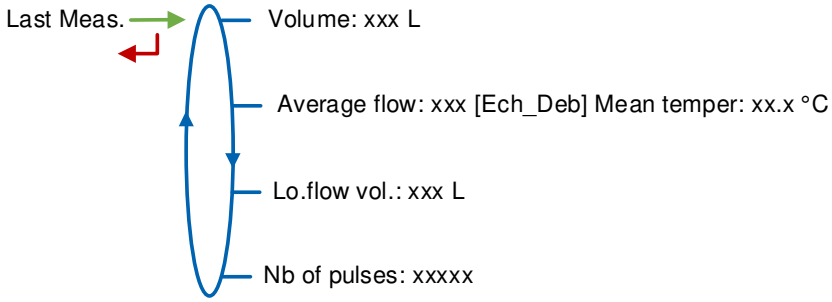
6.3 Menu Visualisa.



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

6.3.1 Sub-menu Last Meas.

This menu displays the information of the last measurement. Information displayed depend on the configuration of the FLEXICOMPT AUTONOME+.



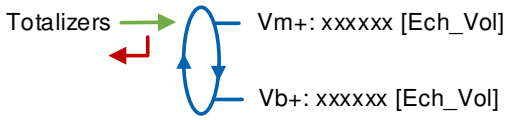
Volume: Measured volume

Average flow; Mean temper: Average flow of the measurement; mean temperature of the measurement

Lo.flow vol: Volume measured under minimal flow rate during measurement

Nb of pulses: Number of pulses of the meter

6.3.2 Sub-menu Totalizers



Vm+: Totalizer of volume in metering conditions

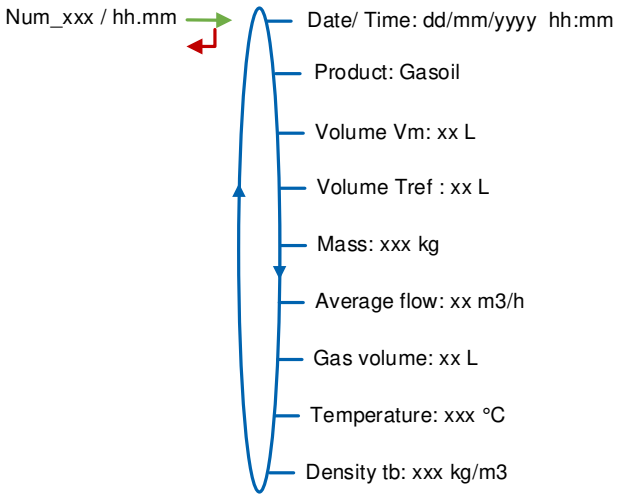
Vb+: Totalizer of volume converted to base conditions if the temperature option is activated

6.3.3 Sub-menu Memory

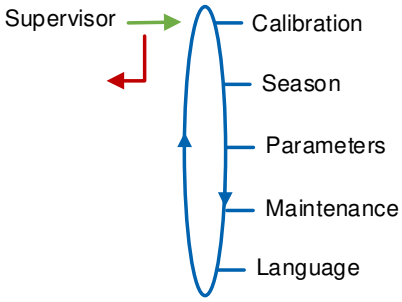
Enter or validate the date and the measurement number to access the relevant data.

Available information depend on the configuration of the FLEXICOMPT AUTONOME+. Temperature, converted volume, and mass are displayed if the temperature option is activated.

The measured Gas volume is displayed for information only. It has no metrological value.



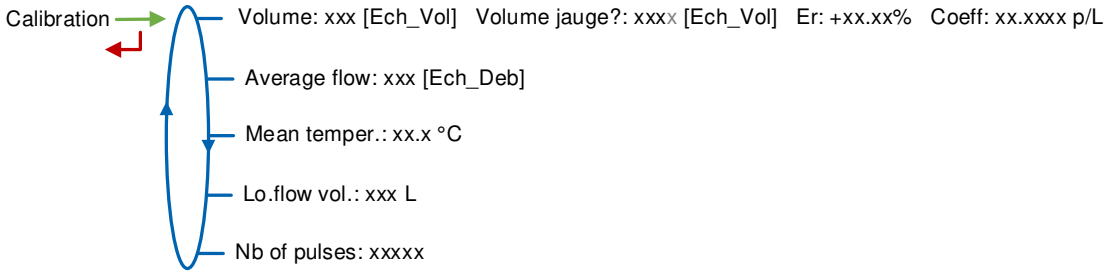
6.4 Menu Supervisor



6.4.1 Sub-menu Calibration

Measure the accuracy of the FLEXICOMPT AUTONOME+ during the calibration with a gauge. It is available after a measurement. Data of the last measurement are available.

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



Volume: Display the volume; **Gauge volume**: Enter the volume read on the calibration mean; **Er**: Display the error in %; **Coeff**: Coefficient to be set only by an authorized person in METROLOGICAL mode, if required

Average flow: Average flow of the measurement

Mean temper: Mean temperature of the measurement

Lo.flow vol: Volume measured under minimal flow rate during measurement
Nb of pulses: Number of pulses of the meter

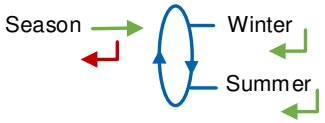
6.4.2 Sub-menu Season

This menu depends on the metrological configuration.

- Metrological configuration: Date time>Time>Season→No season

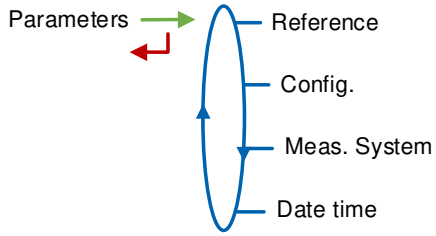
- Metrological configuration: Date time>Time>Season→Summer or
  Date time>Time>Season→Winter

  This menu is used to change from summer to winter time (and back again).

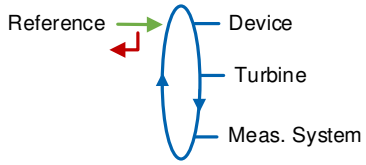


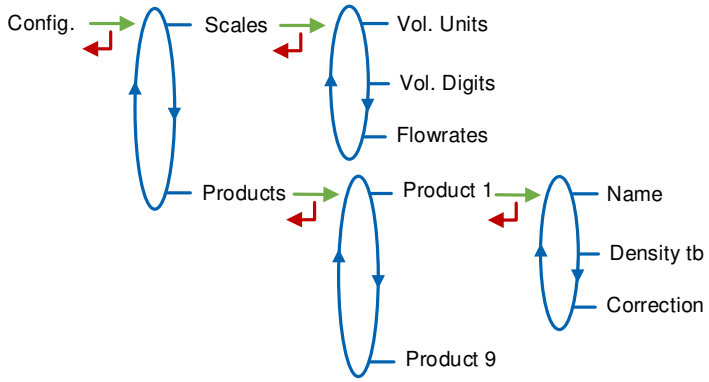
6.4.3 Sub-menu Parameters

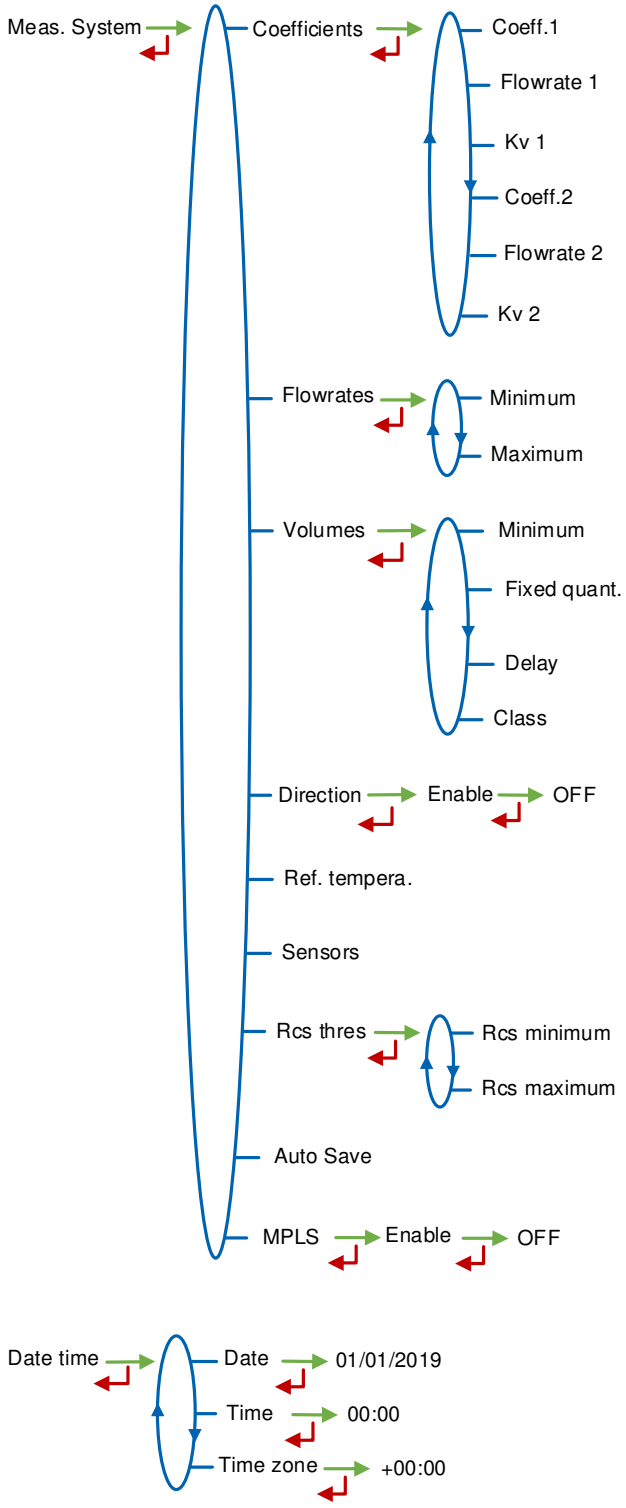
This menu is used to display the parameters set in METROLOGICAL mode. The values depend on the configuration. The values depend on the configuration.



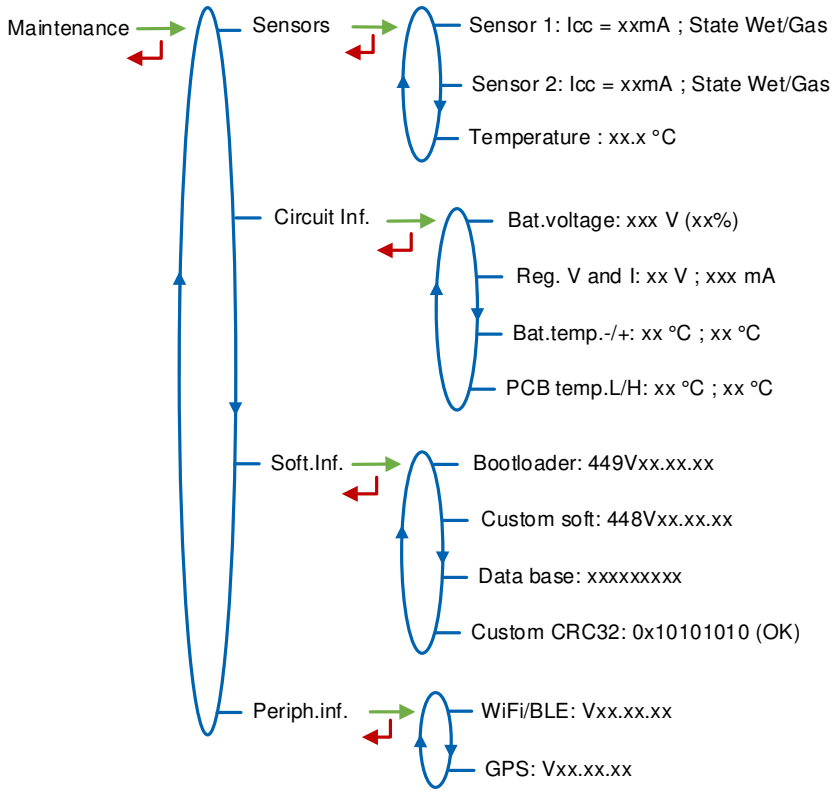
e.g.:






Meas. System
Coefficients
Coeff.1
Flowrate 1
Kv 1
Coeff.2
Flowrate 2
Kv 2
Flowrates
Minimum
Maximum
Volumes
Minimum
Fixed quant.
Delay
Class
Direction
Enable
OFF
Ref. tempera.
Sensors
Rcs thres
Rcs minimum
Rcs maximum
Auto Save
MPLS
Enable
OFF
Date time
Date
01/01/2019
Time
00:00
Time zone
+00:00

6.4.4 Sub-menu Maintenance



Sensors:

- **Sensor 1**:Current and status (wet or dry) of the Sensor 1
- **Sensor 2**:Current and status (wet or dry) of the Sensor 2
- **Temperature**: Product temperature

Circuit Inf.:

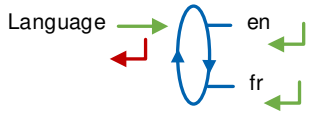
- **Bat.voltage**: Batteries voltage and remaining charge (from 0% to 100%)
- **Reg. V and I**: Internal supply voltage of the UNI-2 circuit
- **Bat.temp**: Batteries temperature
- **T°max; T°min**: Minimum and maximum values of printed circuit operating temperatures in °C

Soft.Inf.: Information about the software, the database and the app

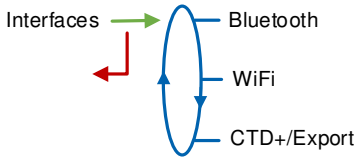
Periph.inf.: Information about peripherals (Wi-Fi, GPS)

6.4.5 Sub-menu Language

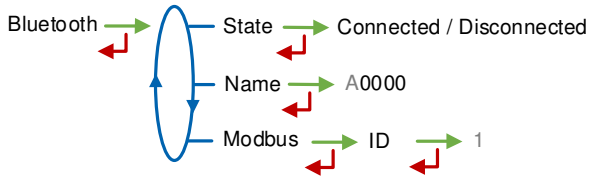
Select the display language. This menu is available if a translation catalogue is uploaded in the UNI-2.



6.5 Menu Interfaces



6.5.1 Sub-menu Bluetooth



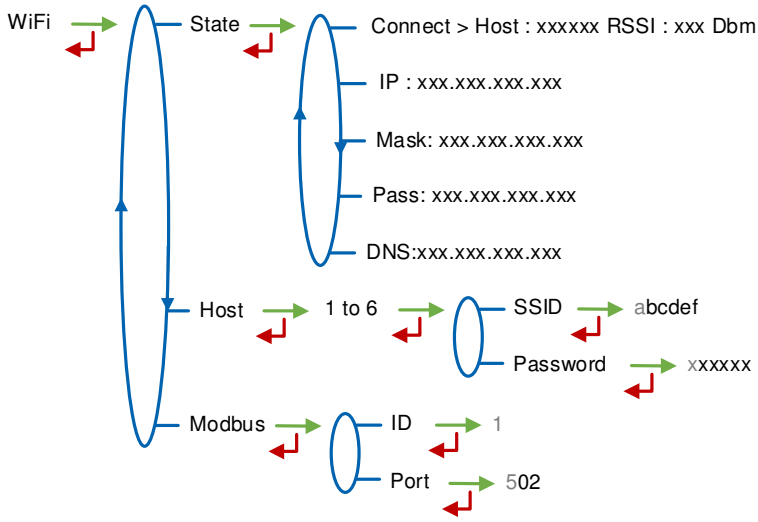
State: Status of the Bluetooth connection

Name: Set the alphanumeric value that corresponds to the connection name

Modbus→ID: ID: Modbus identifier via Bluetooth (between 1 and 254)

6.5.2 Sub-menu Wi-Fi

Characteristics of the wireless network access point



State:

- **Connect**: State of the Wi-Fi connection
- **IP**: IP address of the UNI-2
- **Mask**: Subnet mask (IP mask for the internal IP address allocation)
- **Pass**: Gateway (IP Address for the internet access of the Ethernet interface)
- **DNS**:IP Address to access a DNS server

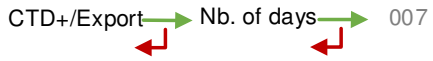
Hosts: Number of the access point

- **SSID**: 32 characters-alphanumeric key that identifies the wireless network uniquely
- **Password**: Network password

Modbus:

- **ID**: UNI-2 Modbus identifier between 0 and 255
- **Port**: TCP/IP access port for Modbus protocol

6.5.3 Sub-menu CTD+/Export



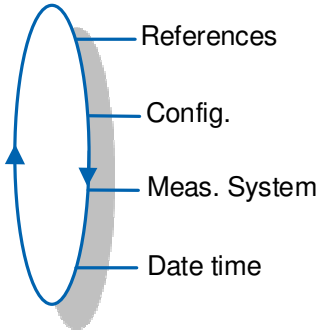
Nb. of days: Set the number of days N for the transfer of the measurement results on the CTD+. If N=007, the measurement results of the last 7 days will be transferred

6.6 List of alarms

Should a fault occur, the FLEXICOMPT AUTONOME+ displays Alarm: name of the default at the bottom of the screen. The volume remains visible. The operator acknowledges the fault by pressing VALID (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	Overflow	Volume greater than 4 194 304 liters	Reset the device
	Low flowrate	Flow rate less than the setting minimal flow rate	Check the hydraulic configuration and the flowing
	Sensor 1	High gas detector fault (GDh)	Use the maintenance menu to check the status of the detector
	Sensor 2	Low gas detector fault (GDl)	Use the maintenance menu to check the status of the detector
	Failure	Problem with the transfer of the files to the CTD+ key	See GU 7110
REPARATOR	Flowrates	Flow setting fault	Check the parameters
	Frequency	Frequency fault	Check the parameters
	Coefficients	Difference two coefficients is greater than 0.5%	Check the coefficients setup
		Problem of metering with the meter	Check the setup
	High flowrate	Flowrate greater than the setting maximum flowrate	Check the setup
	Low flow high	Flow greater than 20m^3/h while GDh dry	Check the setup
	Date time	Loss of date and time	Set date and time in metrological mode or use the menu 'Connect>Sart GPS' to switch on the GPS. This operation must be done outdoors. It lasts one minute to synchronize the clock
	Gas	GDh is wet but GDl is dry	Check the hydraulic configuration / Check the detector status
	Dry metering	When using a pump. The volume of gas is greater than the minimum measured quantity	Stop metering
	Coil	Loss of pulse transmitter signal	Check the connection with the pulse transmitter
	Temperature	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-2
	Watch dog	Fault with card	If steady alarm, substitution of the UNI-2
	Program	Error on the cheksum of the metrological data	If steady alarm, substitution of the UNI-2
	RAM	Saved memory fault	If steady alarm, substitution of the UNI-2
	Memory	Bad writting into the memory	If steady alarm, substitution of the UNI-2
	Metrological	Configuration loss	If steady alarm, substitution of the UNI-2
	Low Battery	The battery is no more charging	Substitution of the battery
	Totalizer	Totalizer fault	If steady alarm, substitution of the UNI-2
	Memory Default	Problem with the measurement integrity: loss of backup data concerning the last measurement	If steady alarm, substitution of the UNI-2
	Communication	Communication fault with IRDA link	Check the IRDA link
	Reception	Problem of communication protocol between the UNI-2 and the CTD+	Check the compatibility
	Micro SD card	Problem with the micro SD card	Check the micro SD card is in. Try another one if necessary

7 CONFIGURE THE FLEXICOMPT AUTONOME+: METROLOGICAL MODE



Setup should be done under cover, metering off, with dry gas detectors.

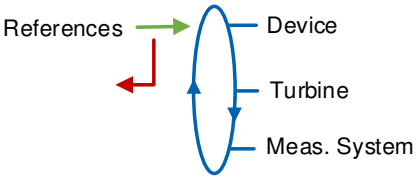
NOTE: Only approved persons are permitted to change parameters

The configuration parameters can only be modified by pressing the micro BP Metro on the electronic board.

Exit the METROLOGICAL mode by pressing the micro BP Metro. The UNI-2 resets.

The option to display the volume (volume in metering conditions or volume converted to base conditions) is made in menu Meas. System>Temperature>Vol. disp. when the temperature is activated.

7.1 Menu References

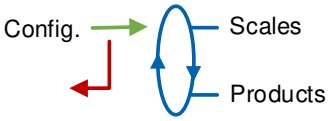


Device: Set the serial number of the UNI-2

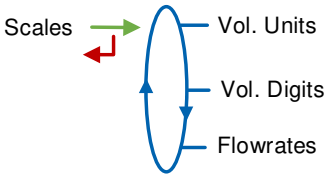
Turbine: Set the serial number of the turbine meter

Meas. System: Set the serial number of the FLEXICOMPT AUTONOME+

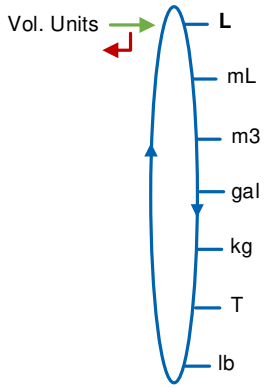
7.2 Menu Config.



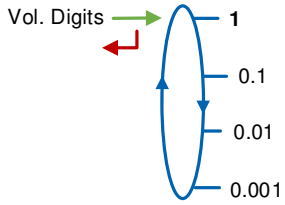
7.2.1 Sub-menu Scales



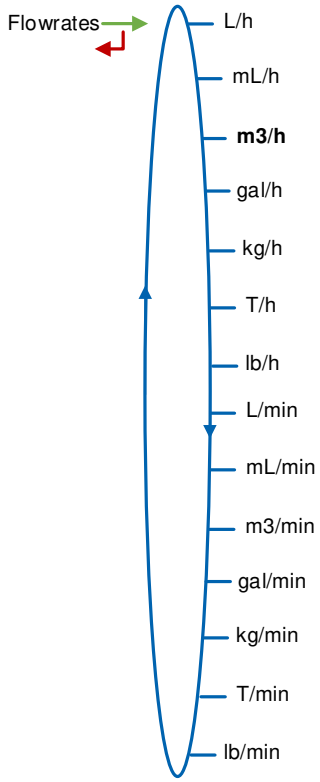
Vol. Units: Select the unit of the volume.



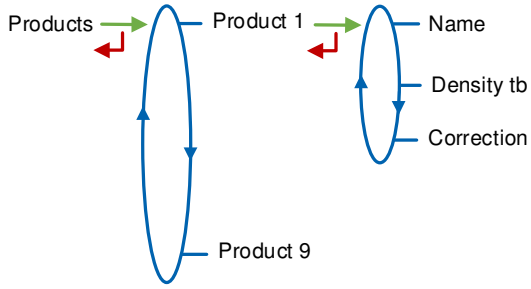
Vol. Digits: Select the accuracy of the volume.



Flowrates: Select the unit and the accuracy of the flowrate.



7.2.2 Sub-menu Products



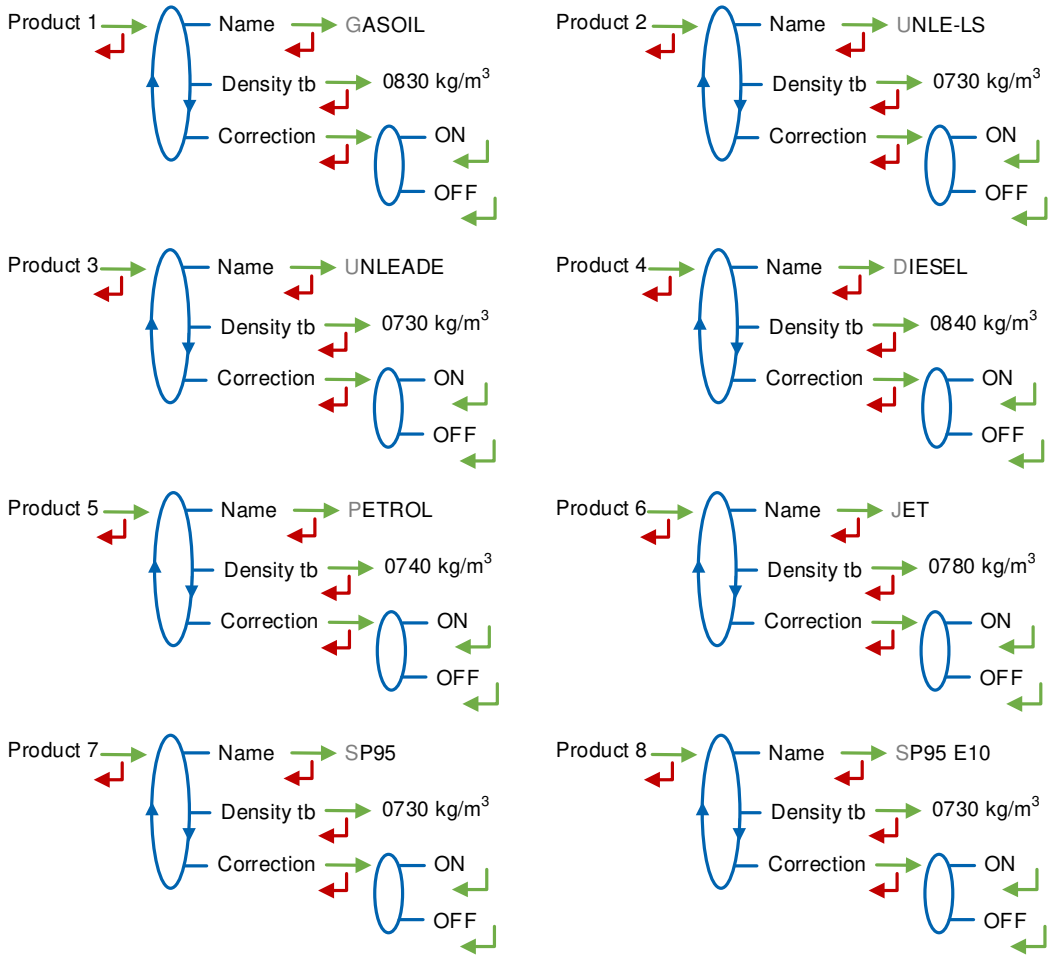
You can configure 9 different products.

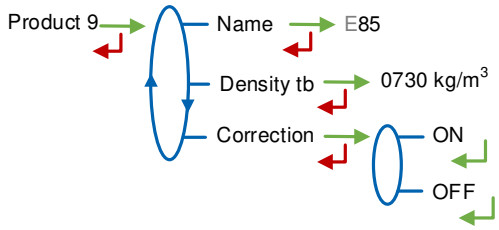
Name: Enter the product name

Density tb: Enter the density in kg/m^3 in base conditions (min: 550 max: 1100). Set 0000 to remove the product from the list displayed in USER mode

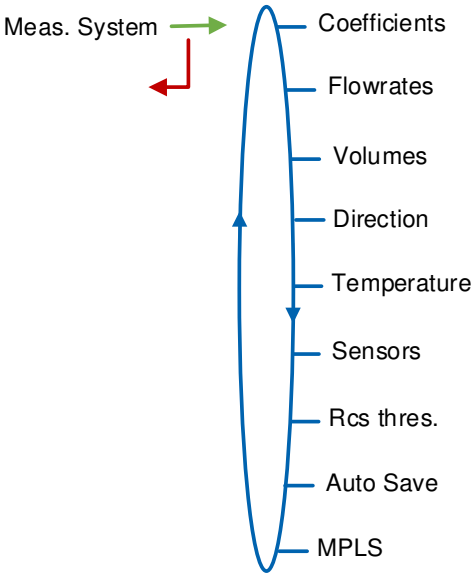
Correction: Select if the correction is on or off for the product. If Density tb≤750 → Correction=ON. Otherwise→ Correction=OFF

The UNI-2 is configured as follows:





7.3 Menu Meas. System



7.3.1 Sub-menu Coefficients

Coeff.1: Coefficient for low flow (pulses/liter)

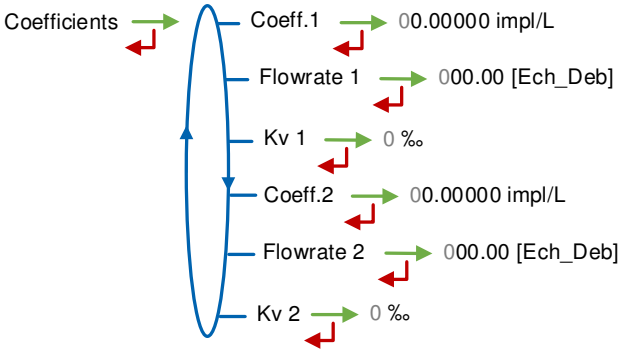
Flowrate 1: Flowrate corresponding to Coeff.1. Unit depends on the configuration (Config.>Scales>Flowrates)

Kv 1: Correction coefficient in (‰) at flowrate 1 for low viscosity products

Coeff.2: Coefficient for high flow (pulses/liter)

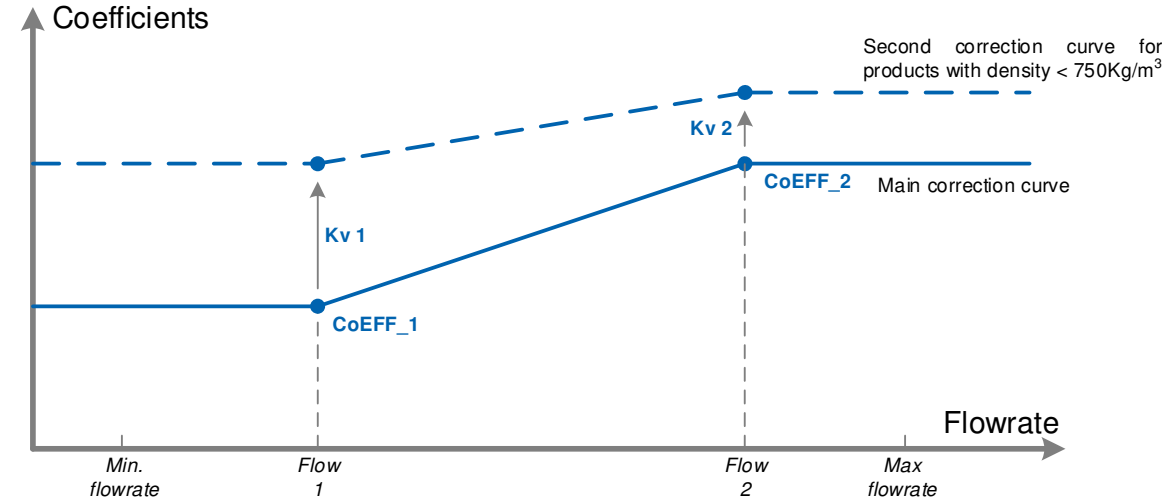
Flowrate 2: Flowrate corresponding to Coeff.2. Unit depends on the configuration (Config.>Scales>Flowrates)

Kv 2: Correction coefficient in (‰) at flowrate 2 for low viscosity products



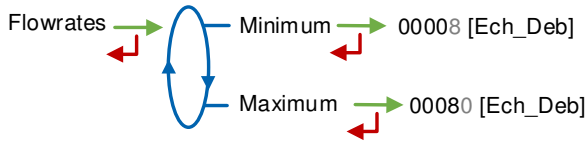
When parameters Flowrate 1 and Flowrate 2 are set to zero, parameters Coeff.2 and Kv 2 are not applied.

Adjustment of coefficients for several flowrates:



Coefficients applied in accordance with flowrate and product density

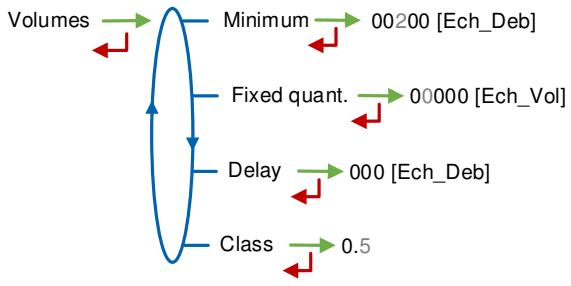
7.3.2 Sub-menu Flowrates



Minimum: Minimum flowrate of the FLEXICOMPT AUTONOME+. Unit depends on the configuration (Config.>Scales>Flowrates)

Maximum: Maximum flowrate of the FLEXICOMPT AUTONOME+. Unit depends on the configuration (Config.>Scales>Flowrates)

7.3.3 Sub-menu Volumes



Minimum: Minimum measured quantity to guaranty the measurement. Unit depends on the choice made for the scale interval

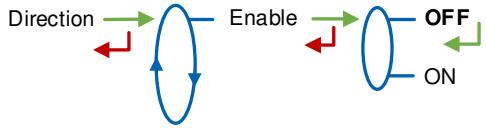
Fixed quant.: End of counting fixed volume of the FLEXICOMPT AUTONOME+. Unit depends on the choice made for the scale interval. Not applicable without gas detectors

Delay: Delay for the additional volume (upper gas detector dry). Unit depends on the choice made for the scale interval. Not applicable without gas detectors

Class: Accuracy class of the FLEXICOMPT AUTONOME+: 0.5

7.3.4 Sub-menu Direction

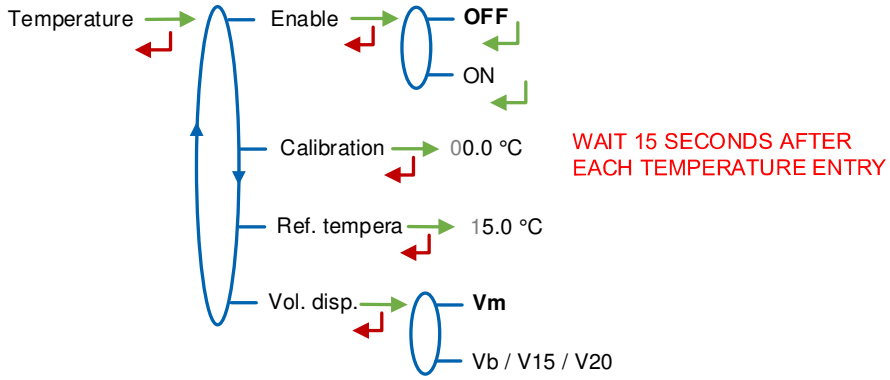
Do not enable this feature.



Enable: Choose OFF

7.3.5 Sub-menu Temperature

This menu is an option. It is used to calibrate the temperature into the FLEXICOMPT AUTONOME+. See maintenance sheet FM 8513



Enable: Enable or disable the product temperature control

Calibration: The temperature calibration can be done either on two measuring points or on a single measuring point.

- Calibration on two temperature measuring points:

  The measure must be done outside the range -20 to +50°C. First point at t<-20°C, second point at t>+50°C.
- Calibration on a single temperature measuring point:

  The measure must be done in the range -20 to +50°C.

Ref. tempera: Reference temperature (°C)

Vol. disp.: Choose the volume displayed in USER mode:

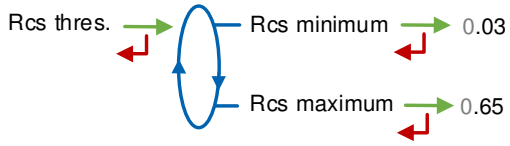
- **Vm**: Volume in metering conditions
- **Vb**: Volume converted to the reference temperature

7.3.6 Sub-menu Sensors

ON: Before validation, make sure both gas sensors are dry and well-connected to the FLEXICOMPT AUTONOME+.

7.3.7 Sub-menu Rcs thres.

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



7.3.8 Sub-menu Auto Save

Set the time required at the end of measurement before automatic recording of the measurement data (in seconds).

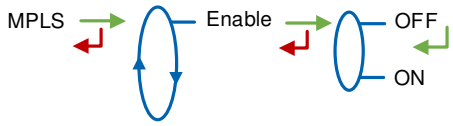
- Auto Save=0: Data recording is manual, it is done by pressing RESET. It causes the volume reset.
- Auto Save>1: Data recording is automatic, it is done when the time-out is up. The RESET key is disabled. The volumes counted during the time-out are added at recording of the measurement data.

  For example, the parameter can have the value that follows:

  Auto Save=060. Automatic recording with time-out 60 seconds

7.3.9 Sub-menu MPLS

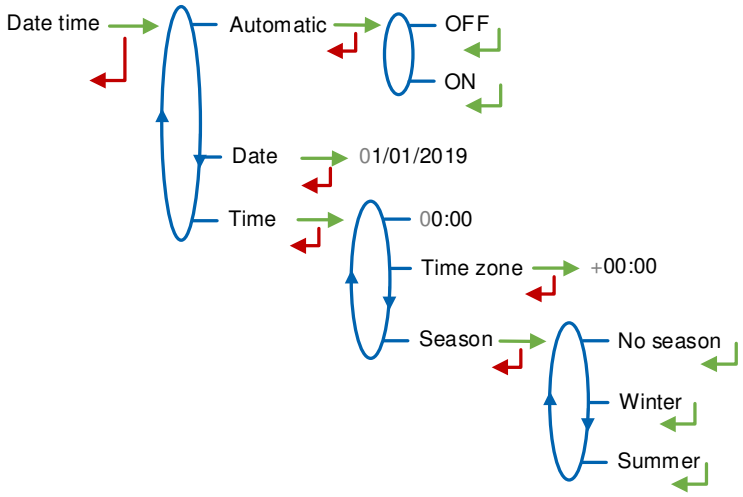
Do not enable this feature.



Enable: Choose OFF

7.4 Menu Date time

This menu is used to define date and time according to the destination country.



Automatic:

- **OFF**: Date and time are set manually
- **ON**: Timing recovery with the GPS

Date: Set the date day/month/year (dd/mm/yyyy)

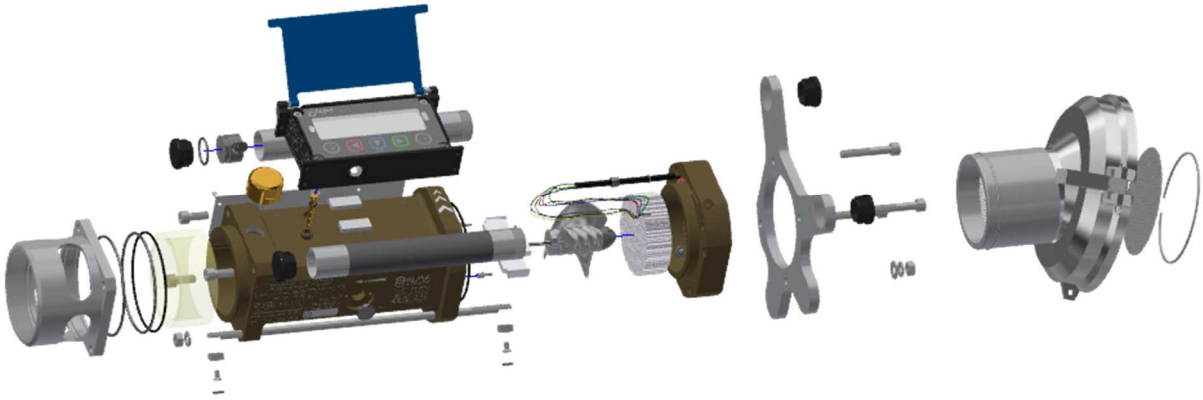
Time:

- **00:00**: Set the time hour:minutes (hh:mm).
- **Time zone**: Set the jet lag related to the time zone. E.g.: set +01:00 for the Brussels, Copenhagen, Madrid, Paris time zone (UTC+01:00)
- **Season**:
  - **No season**: No time change when the season changed
  - **Winter**: Winter-time (at commissioning)
  - **Summer**: Summer-time (at commissioning)

  Time change is done in USER mode with the menu Supervisor>Season

8 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.



8.1 UNI-2 calculator-indicator device

It is made of a box with an intrinsic safety electronic board set by 4 CHC screws (diameter of 4 mm) on the body of the turbine meter. An o-ring is the seal between the casing and the turbine meter. Make sure that it is in its groove and well lubricated before tightening the screws.

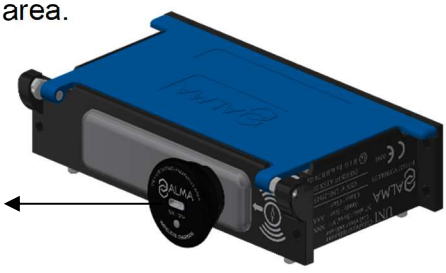
Apart from calibration operations, there is no adjustment or specific maintenance precautions.

See maintenance sheet FM 8513.

8.1.1 Replacement of batteries

The UNI-2 is powered by two rechargeable batteries. These internal batteries have a five years lifetime. The UNI-2 operates with or without its charging module. It has at least one week battery life.

Use the charging module with a USB cable to charge the batteries outside potentially explosive area.



The display of Alarm: Battery at the bottom of the screen means both batteries must be replaced. It must be done outside of potentially explosive area. Only approved persons are permitted to remove the seal.

8.1.2 Modification of the setting parameters

The configuration parameters can only be modified by pressing the micro BP Metro on the electronic board.

Only approved persons are permitted to change parameters.

Any other operation must be done by approved person as it could affect the metrological nature of the FLEXICOMPT AUTONOME+.

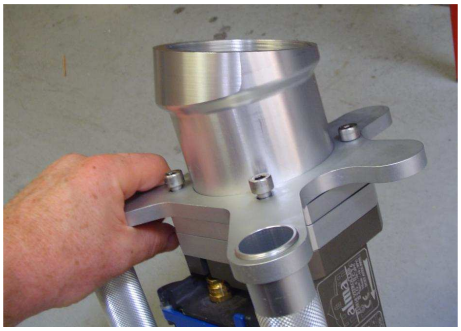
8.2 Hydraulic sleeve

The downstream and upstream sleeves allow the setting of suitable fittings (4" coupler, ½ snap coupling, etc.).

These sleeves are fastened with 4 screws on the turbine meter and can be removed to check the status of the turbine.

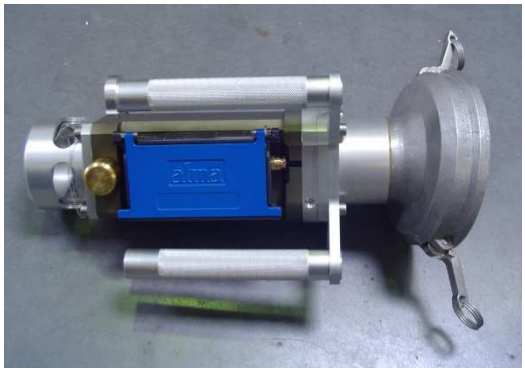
- Position the upstream coupling so that in use the downstream coupling is in the lowest position than the upstream coupling
- Position the upstream coupling as laid down the drawing and the pictures below
- Ensure a good sealing
- Check that the straining sieve and honeycombs are clean (at the entrance of the turbine and after the sieve)
- To ensure electrical continuity, the upstream and downstream couplings of the FLEXICOMPT AUTONOME+ must be sealed with conductor such

Any other operation must be done by approved person as it could affect the metrological nature of the FLEXICOMPT AUTONOME+.



Positioning upstream bent sleeve

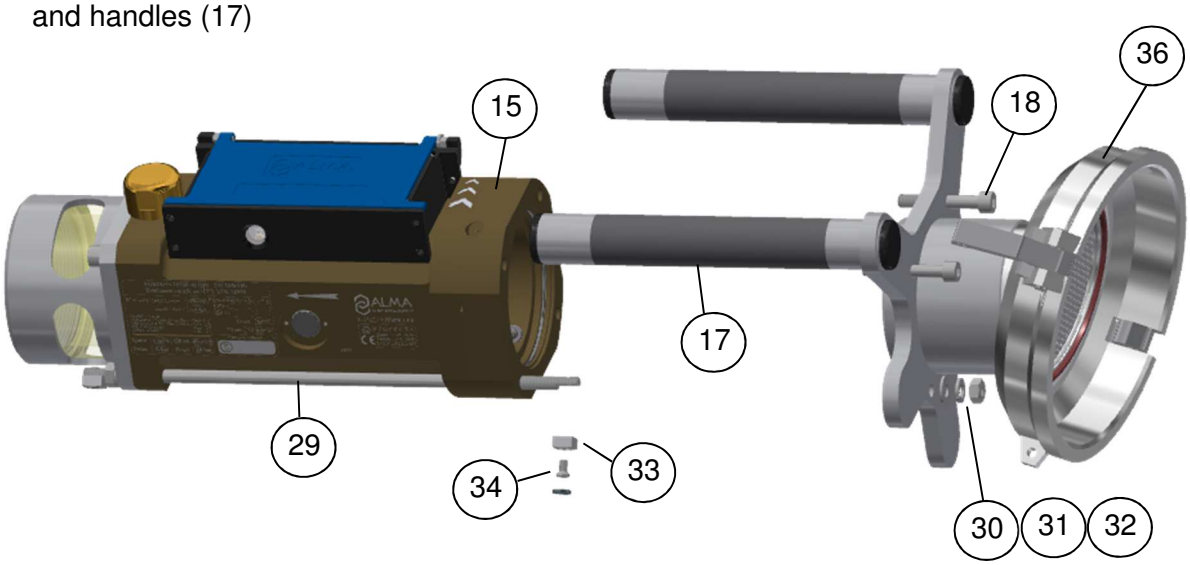
Positioning the API coupler



8.3 2DLA01-spacer

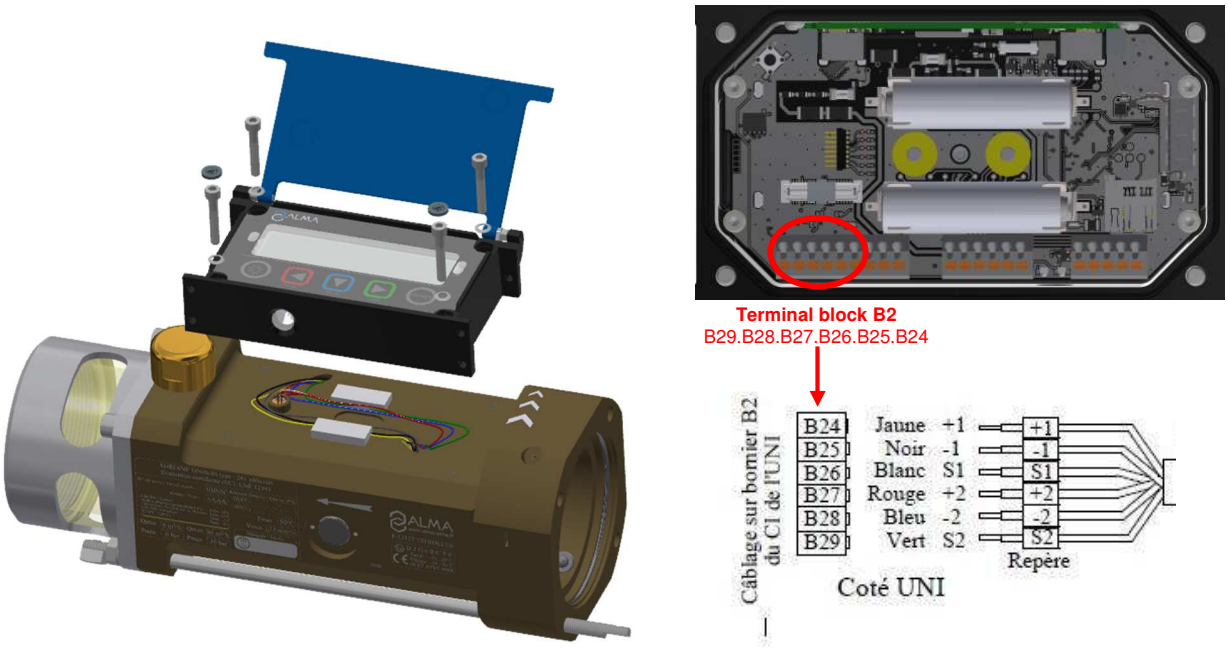
8.3.1 Removing the upstream coupling

- Remove the seal* from the upstream end of the threaded rod (29)
- Unscrew the screw (34) and remove the lead seal cup (33)
- Unscrew the nut (30) from the threaded rod (29) and remove the washers (31) and (32)
- Unscrew the 3 screws (18)
- Remove from the 2DLA01-spacer (15) the API coupler set (36) with handle seat and handles (17)



8.3.2 Removing the 2DLA01-spacer from the UNI-2

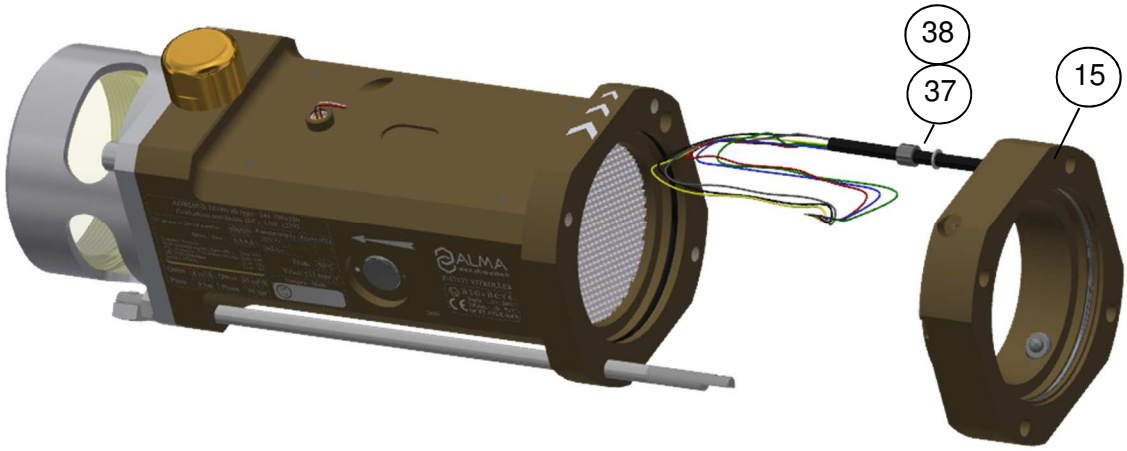
- Remove the 2 seals* from the screws of the UNI-2
- Unscrew the 4 CHC screws of the UNI-2
- Carefully lift up the UNI-2 to find the terminal block B2. Wires are long enough to put the UNI-2 near nearby
- Remove both batteries
- Unplug the 6 wires of the 2DLA01-spacer from the terminal block B2 (see *Picture A)*



Picture A

8.3.3 Removing the 2DLA01-spacer from the turbine

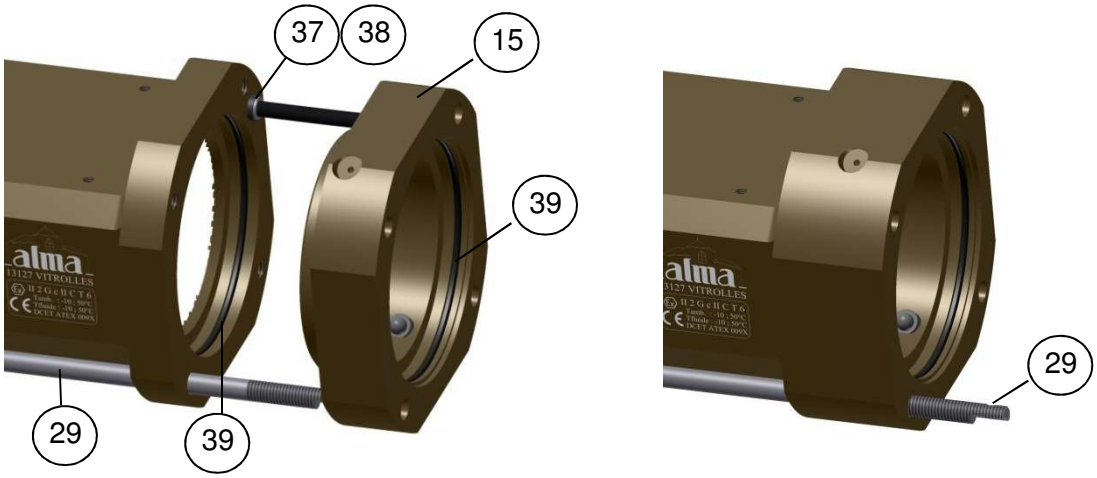
- Remove the 2DLA01-spacer (15) from the turbine body
- Keep by your side the ring (37) and the washer (38) of the 2DLA01-spacer cable



8.3.4 Setting of the new 2DLA01-spacer

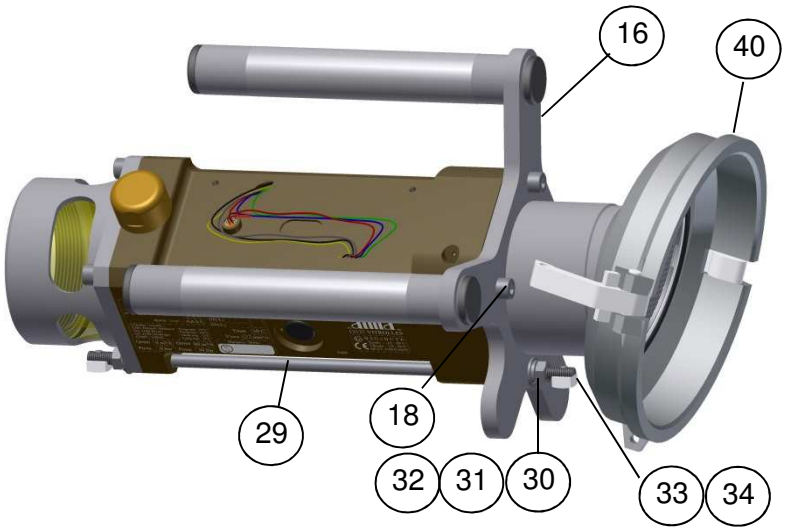
- Grease the rings (39) of the turbine body and the 2DLA01-spacer (translucent grease for food contact)
- Put back the washer (38) and the ring (37) on the cable of the new 2DLA01-spacer
- Pass the 6 wires and then the cable through the wires pass through of the turbine body
- Put the grain (37) in its place on the turbine body and press the washer (38) against the grain (37)

- Put the spacer on the input of the turbine body so that the cable faces the wires pass through and that the threaded rod (29) goes through the 2DLA01-spacer



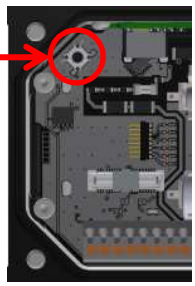
8.3.5 Assembling the upstream coupling

- Put the upstream coupling (40) with the handle seat (16) on the 2DLA01-spacer
- Position the upstream coupling (40) so that in use the downstream coupling is in the lowest position than the upstream coupling
- Screw the 3 screws (18). They must be lubricated with Molybdenum grease
- Put the washers (31) and (32) on the threaded rod (29) and screw the nut (30)
- Put the lead seal cup (33) and the screw (34) on the threaded rod (29)
- Seal the lead seal cup* (if necessary)



8.3.6 Wiring and operational check of the DG in the UNI-2

- Make sure there's no battery
- Plug on the UNI-2 the 6 wires of the 2DLA01-spacer according to *Picture A*
- Put the batteries (respect polarization)
- Press the micro BP Metro to switch the UNI-2 in METROLOGICAL mode
- Enter the menu Sensors→ON
- Make sure both sensors are dry before validation
- Exit the METROLOGICAL mode by pressing the micro BP Metro.



8.3.7 Assembling the UNI-2 on the FLEXICOMPT AUTONOME+

- Check the O-ring is properly positioned in its groove, grease it if necessary (translucent grease for food contact)
- Put the UNI-2 (with the silica gel dehydrating packet) on the FLEXICOMPT AUTONOME+ body
- Make sure there's no wire between the UNI-2 box and the FLEXICOMPT AUTONOME+ body
- Screw the 4 CHC screws of the UNI-2 equipped with SCHNORR washers. Screws must be lubricated with Molybdenum grease
- Seal* both screws of the UNI-2 (if required)

***All these operations must be carried out by approved persons and under the control of the competent authorities. See the certificate of the measuring system and the regulations in force.**

8.4 CTD+

Remove the battery in a non-explosive area. The CTD+ must not be plugged.

The level of the CTD+ battery is indicated in the parameters file (file P0000123). It can be read out, even if the battery is worn, by following the procedure of transfer of the data on a PC described in the Operating guide GU 7110.

8.4.1 Removing the top cover (on the cable plug side)

- Unplug the cable if necessary
- Unscrew and remove the 4 screws from the top cover
- Remove the holder and the cover
- Remove the sheet on the battery
- If necessary slightly unscrew the screws of the base plate to make the removal of the sheet easier

8.4.2 Replacement of the battery

- Proceed to the substitution of the battery and respect polarization (3.6V Lithium AA battery). See maintenance sheet FM 8014.

8.4.3 Assembling the cover

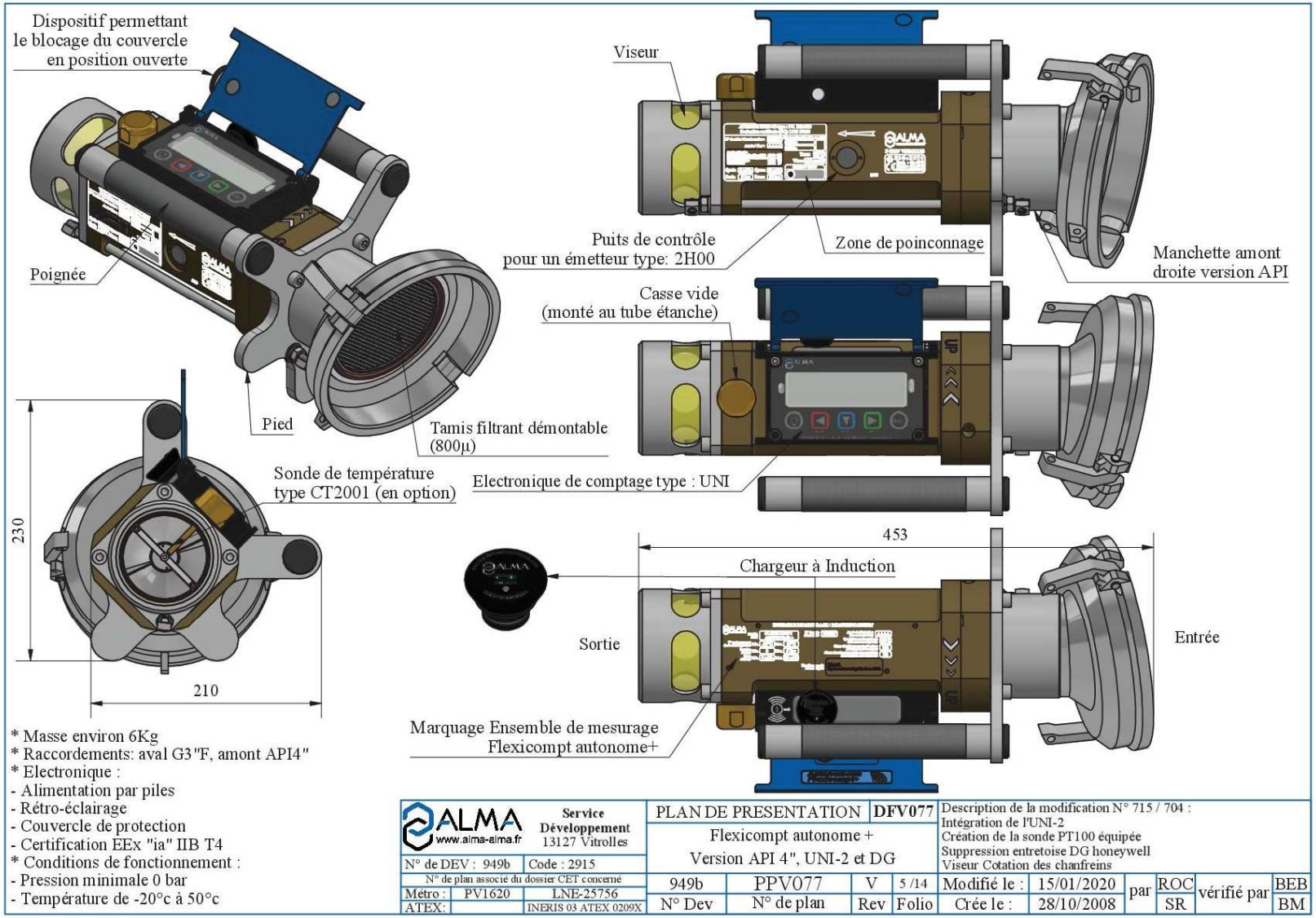
- Put the sheet back on the battery and make sure it's well-positioned in the base holder
- Put back the holder and the top cover
- Screw the 4 screws

9 DRAWINGS AND PART LIST

The drawings below present the FLEXICOMPT AUTONOME+ in MID and not MID versions (PPV077 (DFV077). According to customers' needs, it is equipped with:

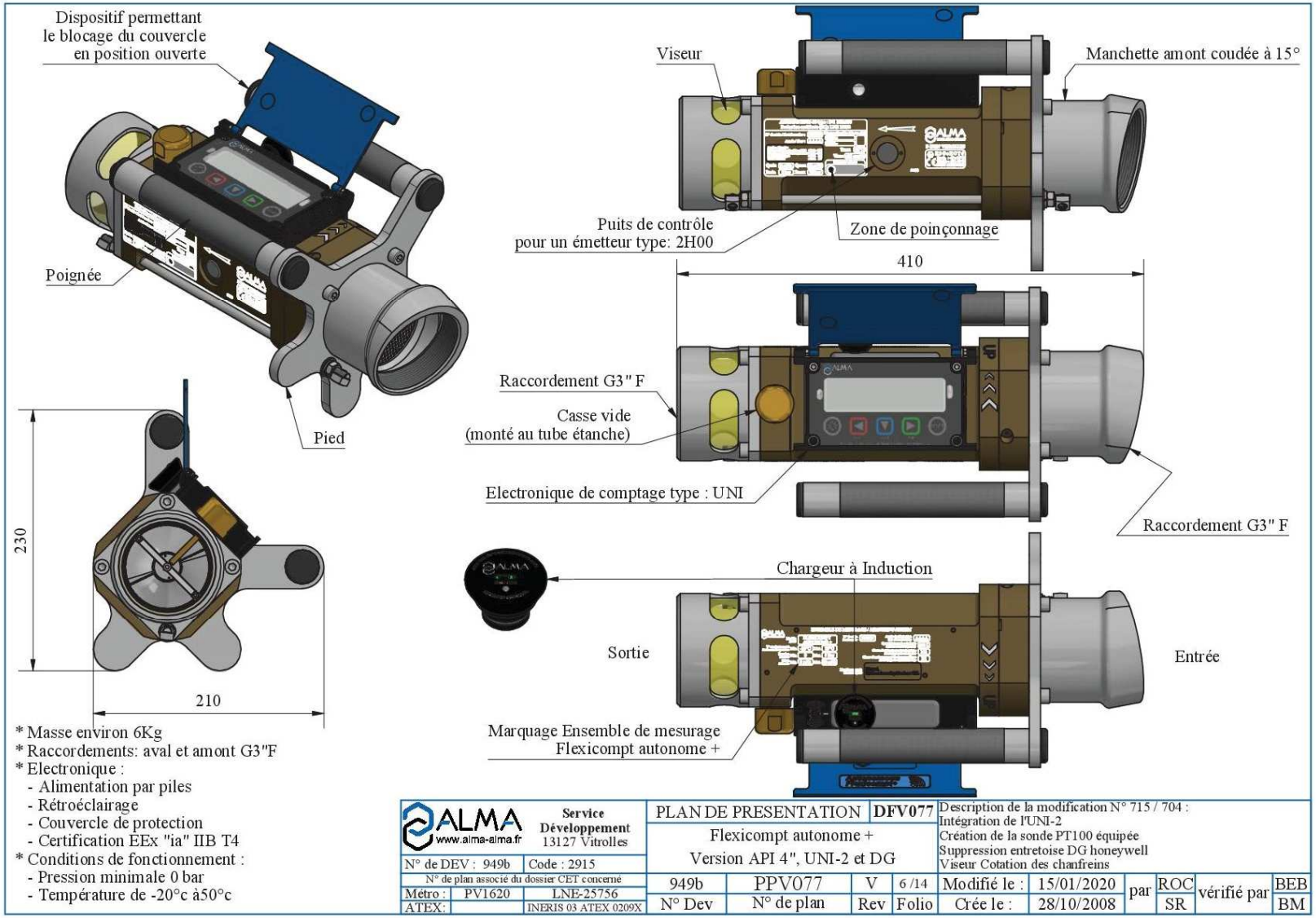
⇨ An upstream straight sleeve with API coupler

⇨ An upstream 15° bent sleeve.



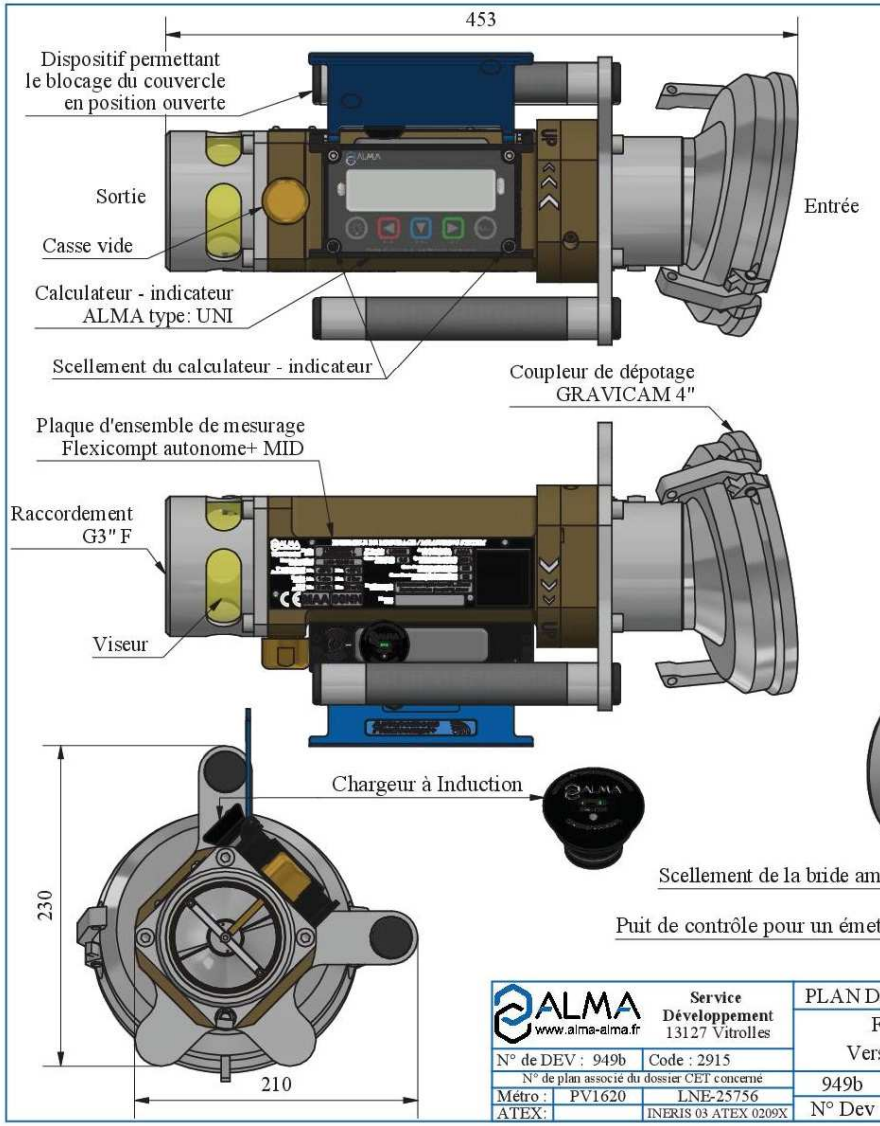
* Masse environ 6Kg
* Raccordements: aval G3"F, amont API4"
* Electronique :
- Alimentation par piles
- Rétro-éclairage
- Couvercle de protection
- Certification EEx "ia" IIB T4
* Conditions de fonctionnement :
- Pression minimale 0 bar
- Température de -20°c à 50°c

ALMA www.alma-alma.fr Service Développement 13127 Vitrolles		PLAN DE PRESENTATION	DFV077			Description de la modification N° 715 / 704 : Intégration de l'UNI-2 Création de la sonde PT100 équipée Suppression entretoise DG honeywell Viseur Cotation des chanfreins						
N° de DEV : 949b	Code : 2915	Flexicompt autonome + Version API 4", UNI-2 et DG										
N° de plan associé du dossier CET concerné		949b	PPV077	V	5 /14	Modifié le :	15/01/2020	par	ROC	vérifié par	BEB
Métro : PV1620	LNE-25756	N° Dev	N° de plan	Rev	Folio	Crée le :	28/10/2008		SR		BM
ATEX:	INERIS 03 ATEX 0209X										

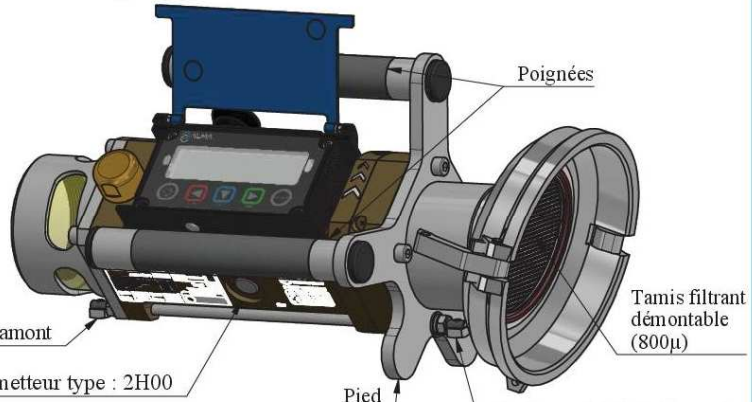


* Masse environ 6Kg
* Raccordements: aval et amont G3"F
* Electronique :
  - Alimentation par piles
  - Rétroéclairage
  - Couvercle de protection
  - Certification EEx "ia" IIB T4
* Conditions de fonctionnement :
  - Pression minimale 0 bar
  - Température de -20°c à50°c

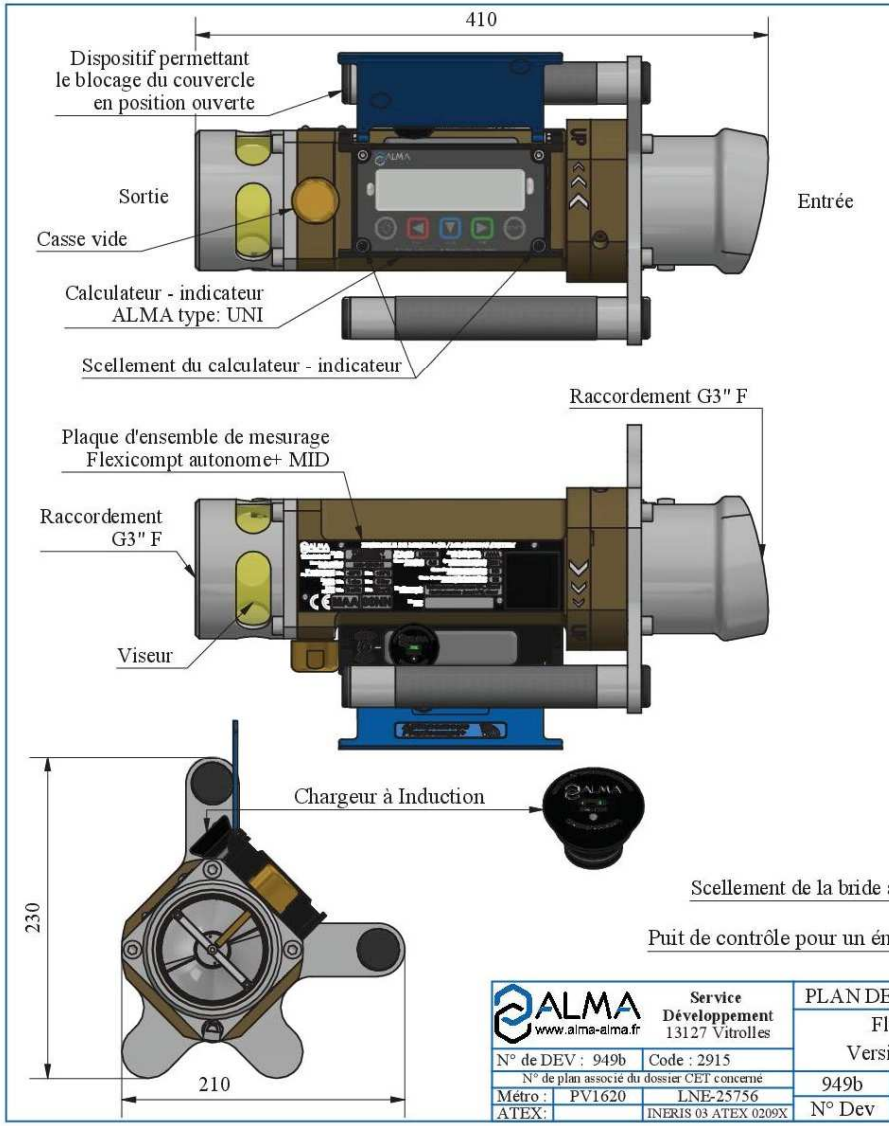
ALMA www.alma-alma.fr	Service Développement 13127 Vitrolles	PLAN DE PRESENTATION	DFV077	Description de la modification N° 715 / 704 : Intégration de l'UNI-2 Création de la sonde PT100 équipée Suppression entretoise DG honeywell Viseur Cotation des chanfreins								
N° de DEV : 949b	Code : 2915	Flexicompt autonome + Version API 4", UNI-2 et DG										
N° de plan associé du dossier CET concerné		949b	PPV077	V	6 /14	Modifié le :	15/01/2020	par	ROC	vérifié par	BEB
Métro : PV1620	LNE-25756	N° Dev	N° de plan	Rev	Folio	Crée le :	28/10/2008		SR		BM
ATEX:	INERIS 03 ATEX 0209X										



- ***Masse:*** ~6Kg,
- ***CEV du Flexicompt autonome + N°:*** LNE-25756
- ***Classe mécanique:*** M2
- ***Classe électromagnétique:*** E2
- ***Classe d'exactitude:*** 0.5
- ***Livraison minimale:*** 200L
- ***Gamme de température:*** -25°C à +55°C
- ***Pression maximale:*** 5 Bar
- ***Débit:*** de 8 à 80 m^3/h
- ***Liquides mesurés:*** Hydrocarbures liquides hors GPL et éthanol
- ***Viscosité:*** ≥ 13mm^2/s
- ***Plage de température des liquides mesurés:*** -20°C à +50°C
- ***Echelons d'indication des volumes:*** 1 L
- ***Portée maximale de l'indication de volume:*** 9 999 999 litres
- ***CEV du mesureur turbine ALMA (type ADRIANE) N°:*** LNE-12393
- ***CEV du calculateur-indicateur ALMA (type UNI) N°:*** LNE-25603
- ***Certification ATEX de l'UNI N°:*** INERIS 07 ATEX 0012X (EEx "ia" IIB T4)
- Alimentation par piles, Rétroéclairage, Couvercle de protection
- Pression minimale 0 bar
- Température de -20°C à50°C



ALMA www.alma-alma.fr	Service Développement 13127 Vitrolles	PLAN DE PRESENTATION		DFV077		Description de la modification N° 715 / 704 : Intégration de l'UNI-2 Création de la sonde PT100 équipée Suppression entretoise DG honeywell Viseur Cotation des chanfreins						
N° de DEV : 949b	Code : 2915	Flexicompt autonome + Version API 4", UNI-2 et DG										
N° de plan associé du dossier CET concerné		949b	PPV077	V	9 /14	Modifié le :	15/01/2020	par	ROC	vérifié par	BEB
Métro : PV1620	LNE-25756	N° Dev	N° de plan	Rev	Folio	Crée le :	28/10/2008		SR		BM
ATEX:	INERIS 03 ATEX 0209X										



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- ***CEV du Flexicompt autonome + N°:*** LNE-25756
- ***Classe mécanique:*** M2
- ***Classe électromagnétique:*** E2
- ***Classe d'exactitude:*** 0.5
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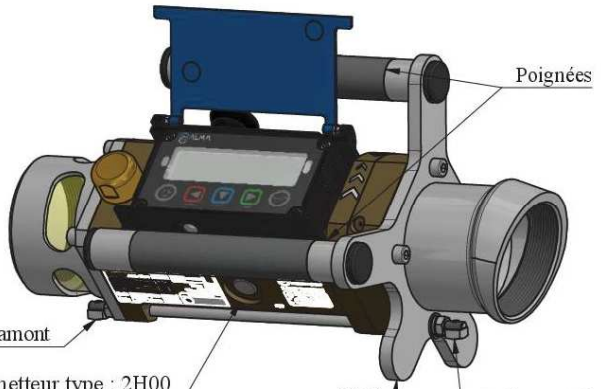
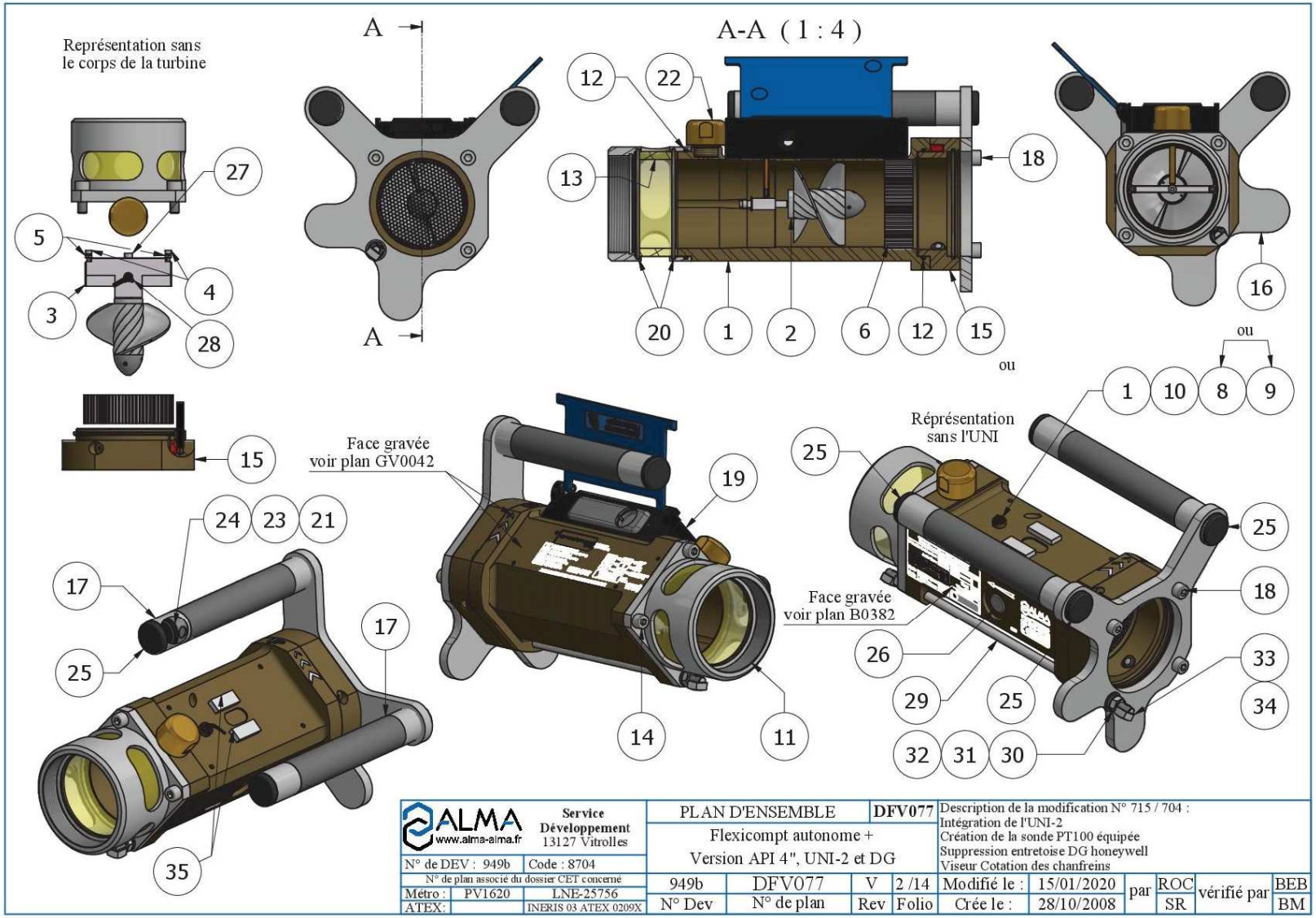


ALMA www.alma-alma.fr	Service Développement 13127 Vitrolles	PLAN DE PRESENTATION	DFV077	Description de la modification N° 715 / 704 : Intégration de l'UNI-2 Création de la sonde PT100 équipée Suppression entretoise DG honeywell Viseur Cotation des chanfreins								
		Flexicompt autonome + Version API 4", UNI-2 et DG										
N° de DEV : 949b	Code : 2915											
N° de plan associé du dossier CET concerné		949b	PPV077	V	10 /14	Modifié le :	15/01/2020	par	ROC	vérifié par	BEB
Métro :	PV1620 LNE-25756	N° Dev	N° de plan	Rev	Folio	Crée le :	28/10/2008		SR		BM
ATEX :	INERIS 03 ATEX 0209X										



ALMA www.alma-alma.fr	Service Développement 13127 Vitrolles	PLAN D'ENSEMBLE	DFV077	Description de la modification N° 715 / 704 : Intégration de l'UNI-2 Création de la sonde PT100 équipée Suppression entretoise DG honeywell Viseur Cotation des chanfreins								
N° de DEV : 949b	Code : 8704	Flexicompt autonome + Version API 4", UNI-2 et DG										
N° de plan associé du dossier CET concerné												
Métro : PV1620	LNE-25756	949b	DFV077	V	2 /14	Modifié le :	15/01/2020	par	ROC	vérifié par	BEB	
ATEX:	INERIS 03 ATEX 0209X	N° Dev	N° de plan	Rev	Folio	Crée le :	28/10/2008		SR		BM	

Rep.	Designation (DFV077)
1	FLEXICOMPT+ body: turbine meter ADRIANE DN80-80 machined, anodized and engraved
2	Propeller D=73 version SP, JET, GO, FOD
3	Light alloy axis seat for propeller D=73
4	Screw CHC M3x12 (ISO 4762)
5	Nut H M3 (ISO 4032)
6	Flow straightener D=78.8, strip 158µ
7	O-ring 5.5x1.2
8	Temperature probe CT2001
9	Plug for temperature probe option D=8
10	Inner retaining ring D=8 steel
11	Downstream sleeve
12	O-ring 92x2.5
13	Plexiglas sight glass, Dext=92, Dint=78, L=37.5
14	Screw CHC M8x20 (ISO 4762)
15	Entretoise deux DLA01 équipée
16	Handle seat
17	Knurled handle D=30, L=210
18	Screw CHC M8x50 (ISO 4762)
19	UNI-2 in a box
20	O-ring 91x3
21	O-ring 22.22x2.62
22	ALMA vacuum breaker G1/2"
23	Neodymium magnet N35 D=1, thickness=4
24	Magnet seal
25	Plug for tube D=30 black polyethylene
26	Closing plug D=14
27	Screw CHC M4x16 (ISO 4762)
28	Split spring thick pin 3x6 A (ISO 8752)
29	Sealing threaded rod
30	Nut H M8 (ISO 4032)
31	Washer W M8 (DIN 127)
32	Washer M M8 (NFE 25-514)
33	Brass square lead seal cup 12x12 for M5 pan head screw
34	Screw FS M 5X10 A4 70 for cylindrical lead seal
35	Adhesive foam gasket 15x30 thickness =3.6

RELATED DOCUMENTS

GU 7033	Operating guide: Flexicompt autonome+
GU 7110	Operating guide: Transfer parameters and measurement results of the UNI/UNI-2 to a computer
MV 5011	Verification Manual Flexicompt autonome+
FM 8014	Maintenance sheet: Replacement of the battery on the CTD+
FM 8512	Maintenance sheet: Adjustment of an ALMA measuring system equipped with a UNI-2
FM 8513	Maintenance sheet: Adjustment of temperature in the UNI-2
MU 7087	User manual: Non ATEX mobile printer kit
MU 7094	User manual: INSIDE App