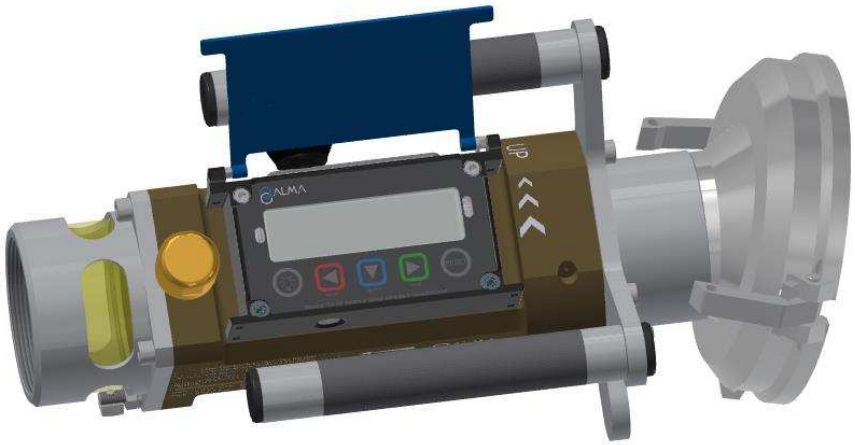
USER MANUAL

MU 7033 EN N

FLEXICOMPT AUTONOME+



Issue	Date	Nature of modifications	Written by	Approved by
N	21/04/2021	Monitoring of battery charge and discharge cycles. Menu Supervisor>Date time. Monitoring of the pulses number on the two counting channels. Update of drawings	DSM	DRA
M	2020/05/18	How to improve battery life, Add menus Supervisor>Date format and Supervisor>Maintenance>Reboot, Functional changes and improvements	DSM	SH
L	2020/01/27	UNI-2 *[PJV158]*	DSM	SH
A	2010/04/29	Creation	DSM	XS

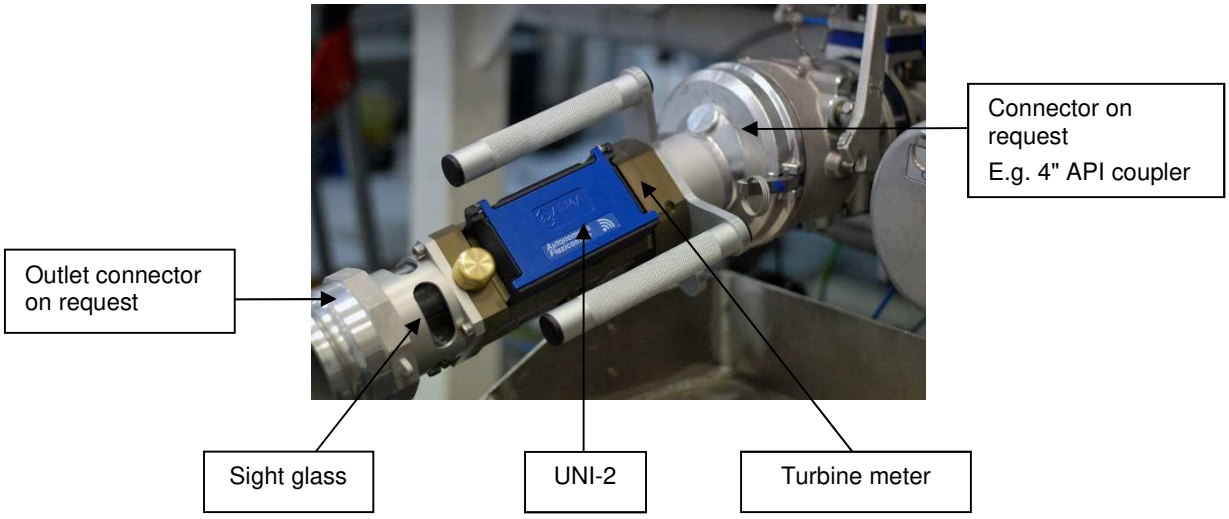
CONTENTS

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:

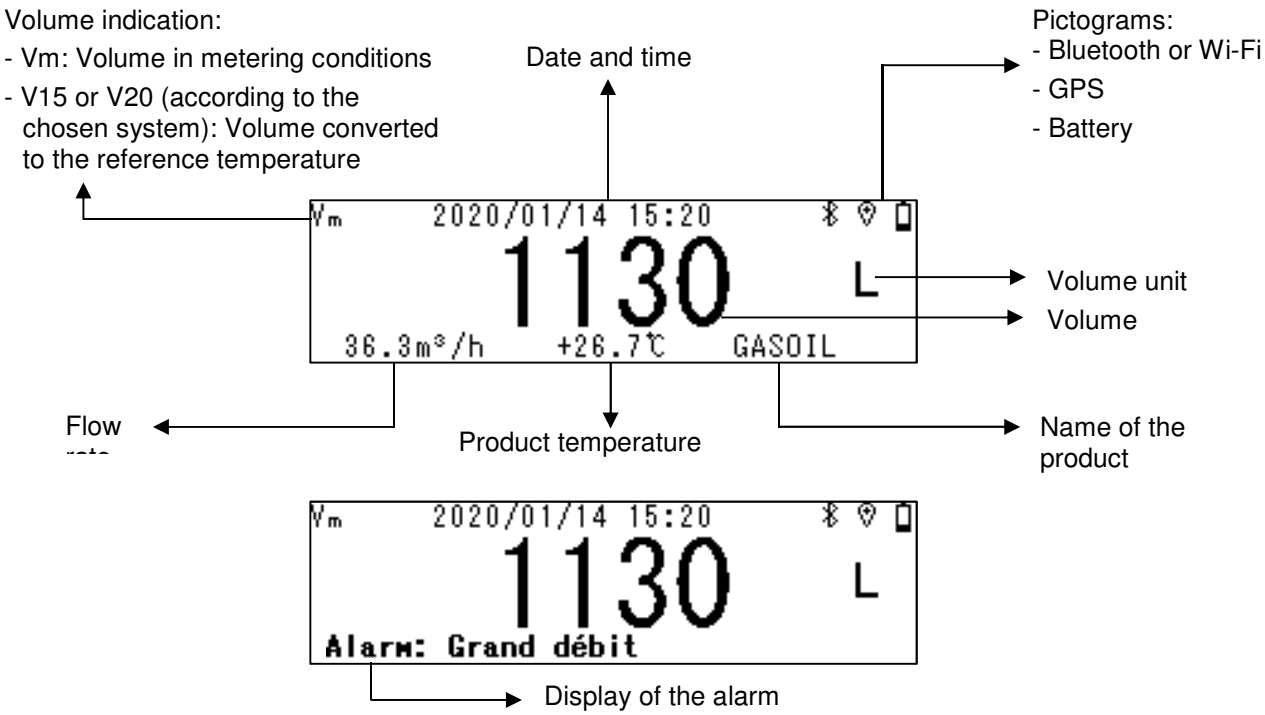
- ⇨ Measure products when they are delivered to the station
- ⇨ Monitor the reception of products (lorry/wagon)
- ⇨ Split compartments
- ⇨ Measure product returns
- ⇨ Issue tank charts
- ⇨ Manage faults
- ⇨ Communicate with a PC/tablet/portable device thanks to the wireless connection.

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 Lighting is inhibited when Wi-Fi is enabled
	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 Reset the display when entering data

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

Wi-Fi cannot work with Bluetooth or GPS

The Wi-Fi network name and the Wi-Fi password cannot exceed 10 characters. The allowed special characters are + and -

2.1 Connected functions

The wireless connection enables the FLEXICOMPT AUTONOME+ to communicate 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:

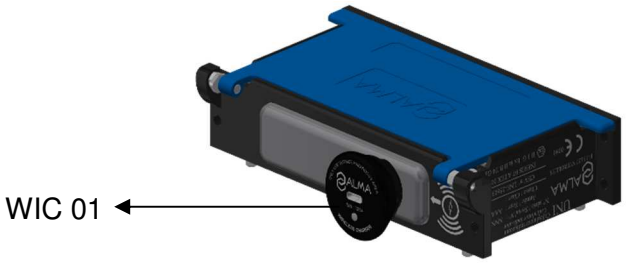
- Bluetooth Low Energy 4.1 or Wi-Fi (IEEE 802.11 b/g/n (2.4GHz)

  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 FLEXICOMPT AUTONOME+ 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.

To charge the battery, use only the USB cable and the charging module WIC 01, supplied with the equipment.



Charge batteries outside potentially explosive area

To save battery life:

- The Bluetooth or Wi-Fi connection are activated manually in the menu Interfaces of the USER mode.
- Wi-Fi cannot work with Bluetooth or GPS
- Lighting is inhibited when Wi-Fi is enabled
- The communication modules are automatically switched to standby after a period of inactivity.
- The GPS turns 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. Turn of the GPS at the end of synchronization (see Connect>Start GPS).

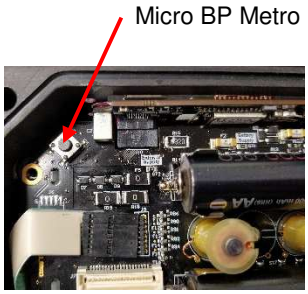
3 CONFIGURATION, SETTINGS AND CALIBRATION

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+.

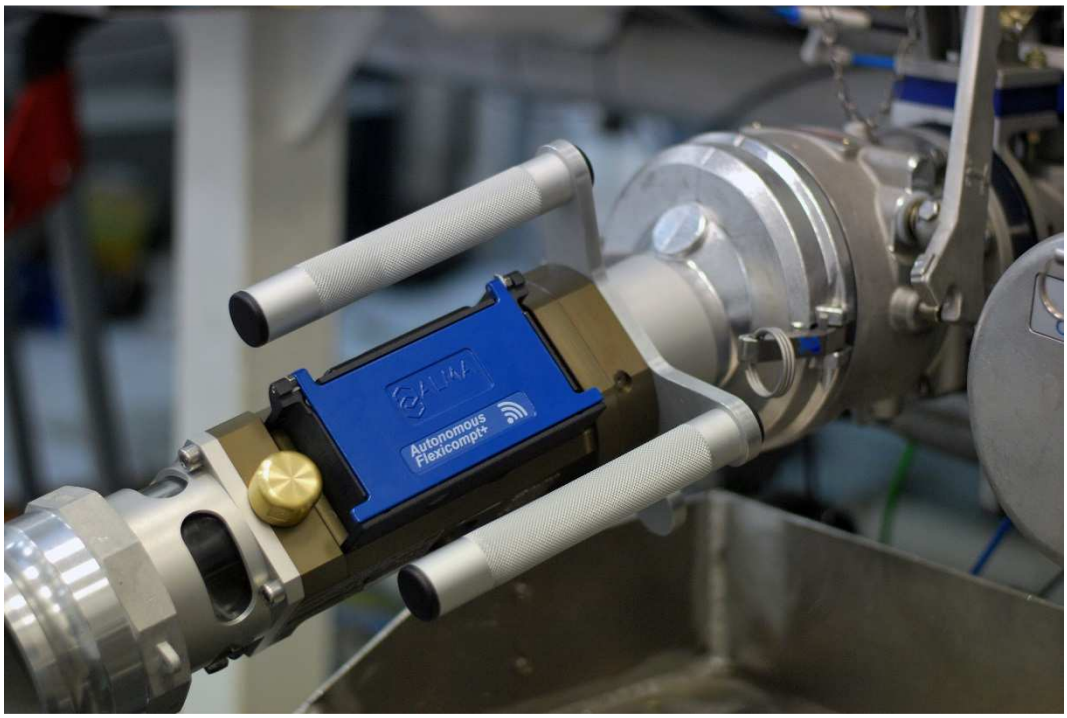
⇨ **Charge batteries outside potentially explosive area**

⇨ **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.

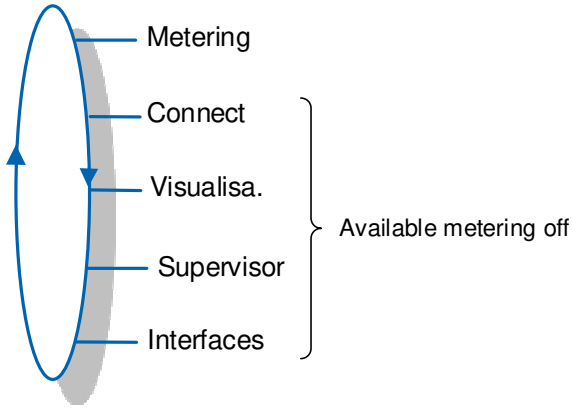
⇨ For partial emptying:

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

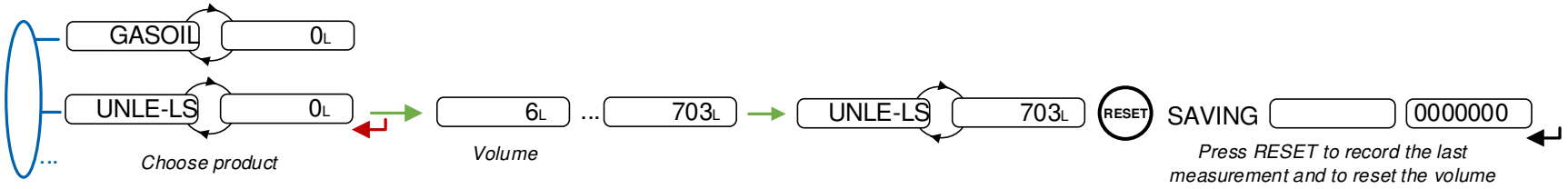


The FLEXICOMPT AUTONOME+ is on metering between the first command level after initialization or resetting the current volume to zero, and resetting the current volume to zero.

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.

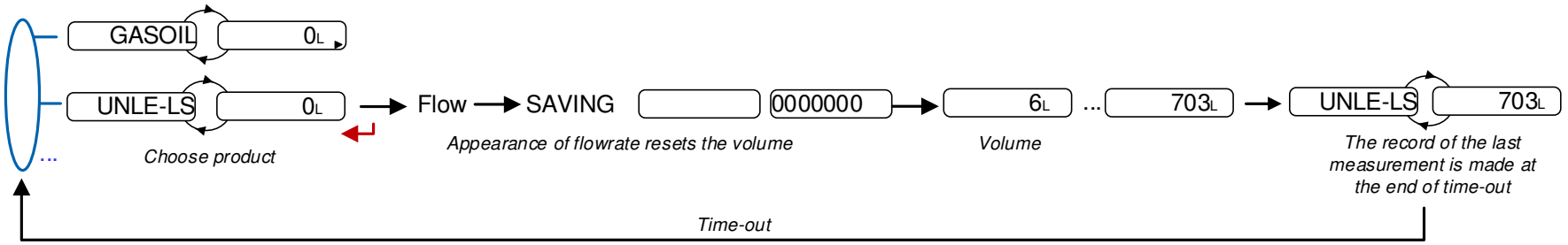
6.1 Menu Metering

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 via Bluetooth or Wi-Fi. See the user guide GU 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

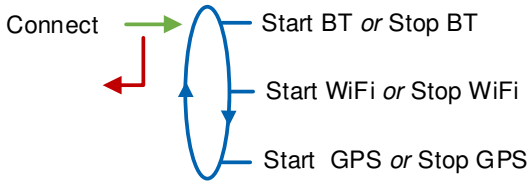
6.1.3.1 Printing with the INSIDE app

Use the INSIDE app to print the delivery ticket. This feature is used to print delivery ticket as a PDF file. See the user guide GU 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

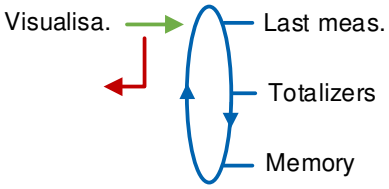


Start BT: Start or stop Bluetooth connection. The Bluetooth switches automatically to stand-by mode after two minutes of inactivity when connection is off and after ten minutes of inactivity when connection is on

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.

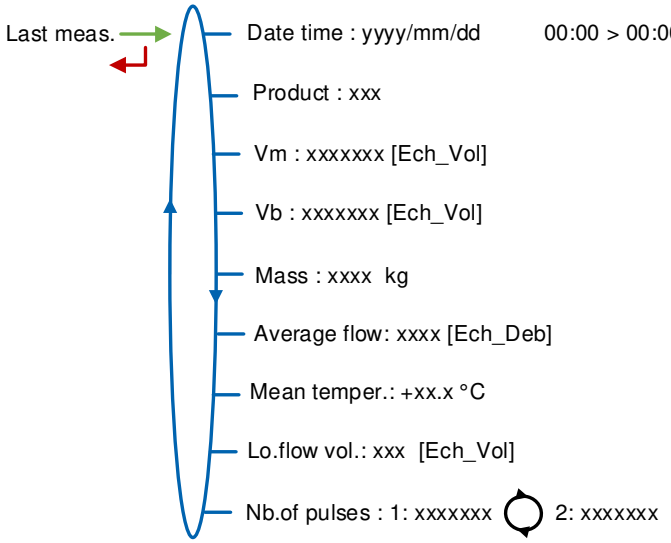
6.3 Menu Visualisa.



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+.



Date time: Date and time when measurement started and ended

Product: Product

Vm: Volume in metering conditions

Vb: Volume converted to the reference temperature

Mass: Mass

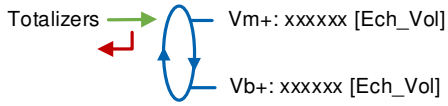
Average flow: Average flow of the measurement

Mean temper: Mean temperature of the measurement

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

Nb.of pulses: Number of pulses by liter of the measuring device (way 1 alternating with way 2)

6.3.2 Sous-menu Totalizers



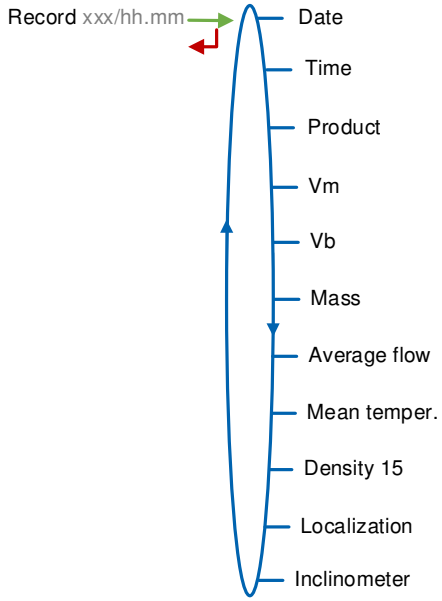
Vm+: Totalizer of volume in metering conditions

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

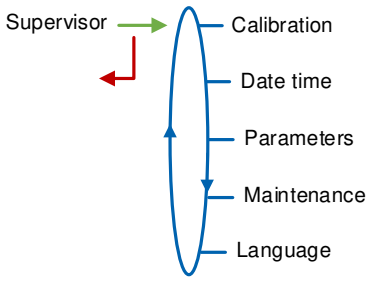
6.3.3 Sub-menu Memory

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 volume of gas VG is displayed for information only. It has no metrological value.



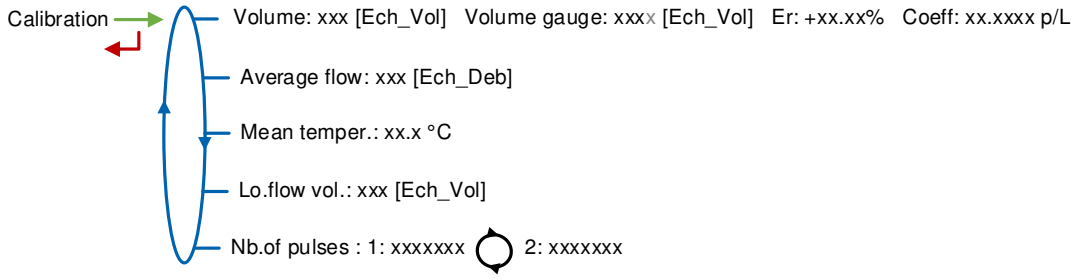
6.4 Menu Supervisor



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

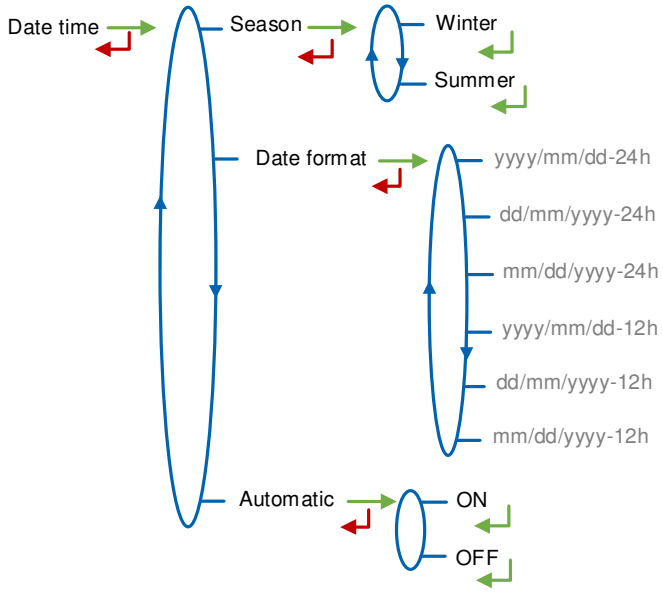
Average flow: Average flow of the measurement

Mean temper: Mean temperature of the measurement

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

Nb.of pulses: Number of pulses by liter of the measuring device (way 1 alternating with way 2)

6.4.2 Sub-menu Date time



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

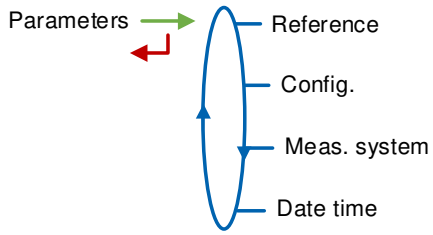
Date format: This menu is used to choose the date format

Automatic:

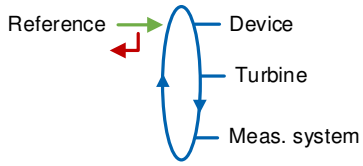
- **ON**: Timing recovery with the GPS
- **OFF**: Date and time are set manually

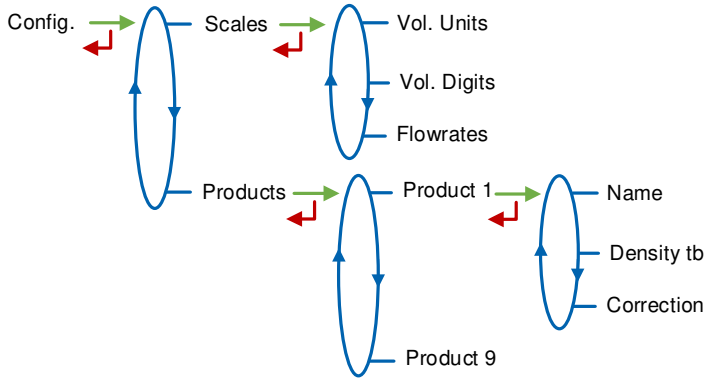
6.4.3 Sub-menu Parameters

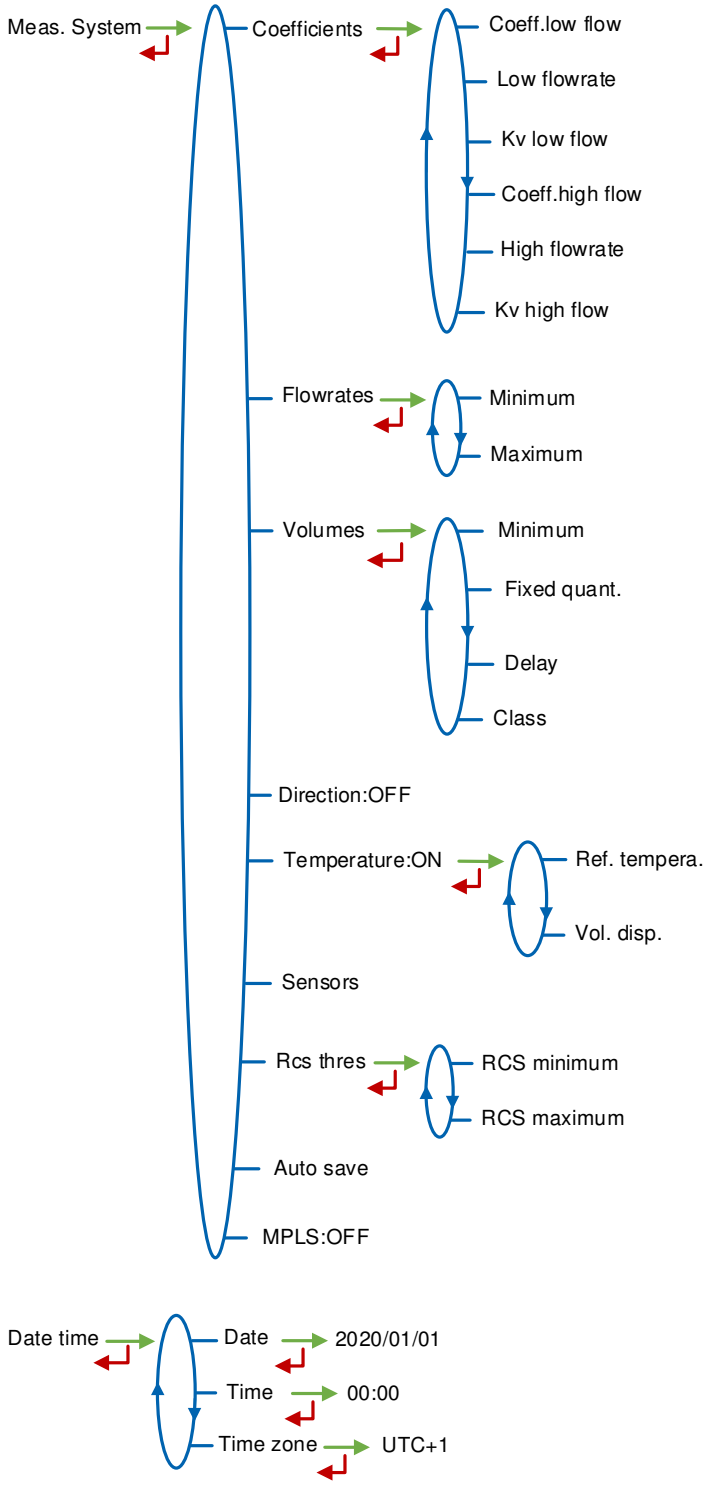
This menu is used to display the parameters set in METROLOGICAL mode. The values depend on the configuration. The values depend on the configuration.



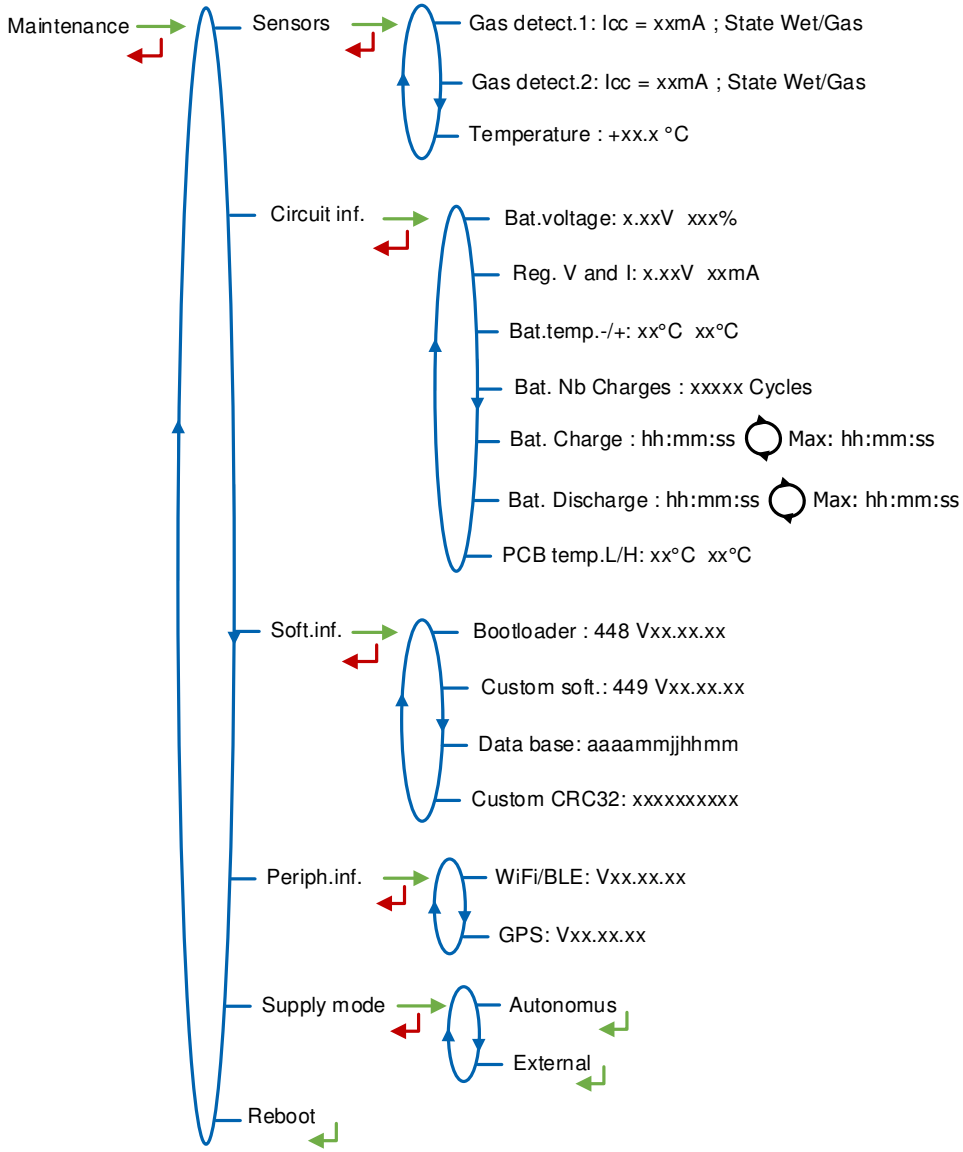
e.g.:






Meas. System
Coefficients
Coeff.low flow
Low flowrate
Kv low flow
Coeff.high flow
High flowrate
Kv high flow
Flowrates
Minimum
Maximum
Volumes
Minimum
Fixed quant.
Delay
Class
Direction:OFF
Temperature:ON
Ref. tempera.
Vol. disp.
Sensors
Rcs thres
RCS minimum
RCS maximum
Auto save
MPLS:OFF
Date time
Date
2020/01/01
Time
00:00
Time zone
UTC+1

6.4.4 Sub-menu Maintenance



Sensors:

- **Gas detect. 1**: Current and status (wet or dry) of the gas detector 1
- **Gas detect. 2**: Current and status (wet or dry) of the gas detector 2
- **Temperature**: Product temperature

Circuit Inf.:

- **Bat.voltage** : Batteries voltage and remaining charge (from 0% to 100%)
- **Reg. V and I**: Internal supply voltage and current of the UNI-2 circuit
- **Bat. temp.-/+**: Minimum and maximum values of the batteries temperature
- **Bat. Nb Charges**: Number of charge cycles with the WIC 01
- **Bat. Charge**: Alternating display of the current and maximum charging time among all charging cycles with the WIC 01
- **Bat. Discharge**: Alternating display of the current and maximum discharging time among all discharging cycles with the WIC 01

- **PCB temp.L/H**: 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/Bluetooth and GPS)

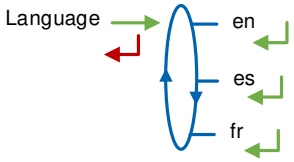
Supply mode:

- **Autonomus**: VALID THIS CHOICE
- **External**: Do not valid

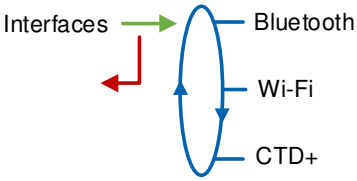
Reboot: When blocked, the UNI-2 reboots. Metrological and supervisor parameters are saved as well as the measurements recording

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



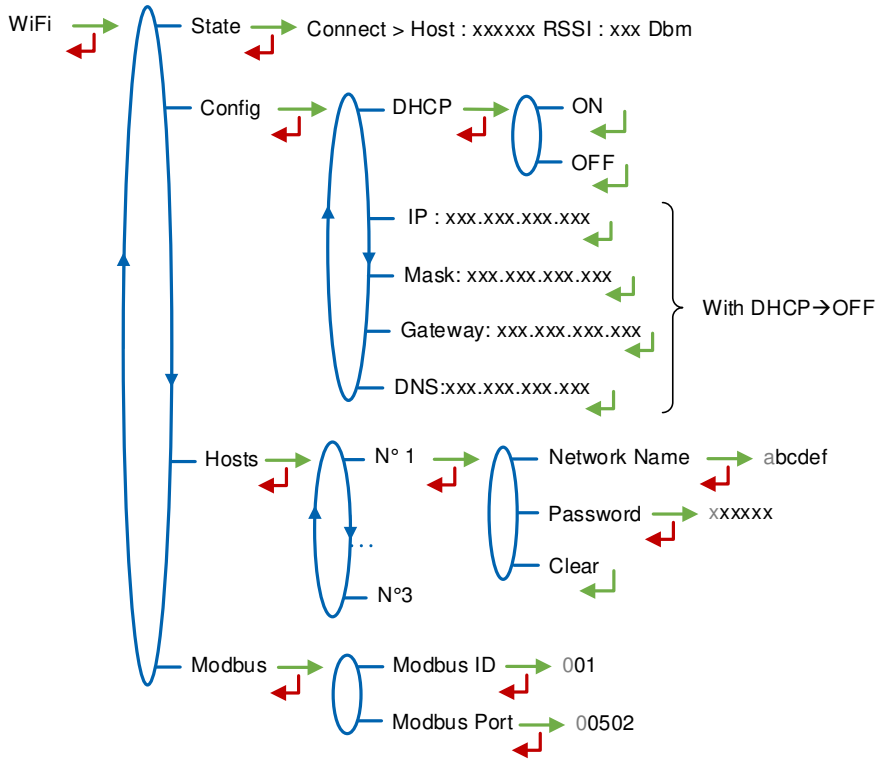
6.5.1 Sub-menu Bluetooth

State: Status of the Bluetooth connection

Name: Assign a Bluetooth device name to UNI-2 (alphanumeric value such as the serial number for example)

6.5.2 Sub-menu Wi-Fi

Characteristics of the wireless network access point



State:

- **Connect:** Status of the Wi-Fi connection

Config:

- **DHCP**:
  - **ON**: The Wi-Fi network automatically assigns an IP address to the UNI-2
  - **OFF**: The parameters of the Wi-Fi connection are set manually
- **IP**: IP address of the UNI-2
- **Mask**: Subnet mask (IP mask for the internal IP address allocation)
- **Gateway**: Gateway (IP Address for the internet access of the Ethernet interface)
- **DNS**:IP address to access a DNS server

Hosts: You can set three access points

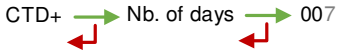
The Wi-Fi network name and the Wi-Fi password cannot exceed 10 characters. The allowed special characters are + and -

- **Network name**: Wi-Fi network name
- **Password**: Wi-Fi network password
- **Clear**: Clear the network data

Modbus:

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

6.5.3 Sub-menu CTD+



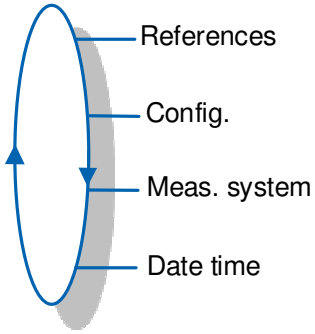
Nb. of days: Set the number of days N for the transfer of the measurement results on the CTD+. If N=007, the measurement results of the last 7 days will be transferred

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	COMMON	Overflow	Volume greater than 4 194 304 liters	Reset the device
		Low flowrate	Flow rate less than the setting minimal flow rate	Do a check of the hydraulic configuration and the flowing
		No flowrate	No flowrate	Do a check of the hydraulic configuration and the flowing
		Sensor 1	High gas detector fault (GDh)	Use the maintenance menu to do a check of the detector status
		Sensor 2	Low gas detector fault (GDl)	Use the maintenance menu to do a check of the detector status
		Failure	Problem with the transfer of the files to the CTD+	See GU 7110
		Bat too low	Battery is not charged enough to light the display or to start Bluetooth, Wi-Fi or GPS	Outside potentially explosive area: Charge the battery (min 50%)
		Init Bluetooth	Bluetooth module initialization problem	Restart the UNI-2 via the menu Supervisor>Maintenance>Reboot
		Init GPS	GPS module initialization problem	Restart the UNI-2 via the menu Supervisor>Maintenance>Reboot
		Init Wi-Fi	Wi-Fi module initialization problem	Restart the UNI-2 via the menu Supervisor>Maintenance>Reboot
REPARATOR	COMMON	Flowrates	Flow setting fault	Do a check of the parameters
		Frequency	Frequency fault	Do a check of the parameters
		Coefficients	Difference two coefficients is greater than 0.5%	Do a check of the coefficients setup
		Metering	Problem of metering with the meter	Do a check of the parameters
		High flowrate	Flowrate greater than the setting maximum flowrate	Do a check of the parameters
		Low flow high	Flow greater than 20m^3/h while GDh dry	Do a check of the parameters
		Date time	Loss of date and time	Set date and time in metrological mode or use the menu Connect>Start 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	Do a check of the hydraulic configuration / 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	Do a check of the connection with the pulse transmitter
		Temperature	Faulty temperature measure. Temperature less than -20°C or greater than 50°C	Do a check of the temperature sensor (measure and calibration)
		Display	LCD display fault	If steady alarm, substitution of the UNI-2
		Watchdog	Fault with card	If steady alarm, substitution of the UNI-2
		Program	Error on the checksum 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 writing into the memory	If steady alarm, substitution of the UNI-2
		Metrological	Loss of configuration	If steady alarm, substitution of the UNI-2
		Low Battery	The battery is no more charging	Substitution of the battery
		Totaliser	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
		Micro SD card	Problem with the micro SD card	Make sure 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.

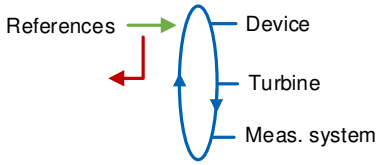
NOTE: Only approved persons are permitted to change parameters

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

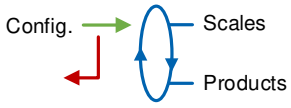


Device: Set the serial number of the UNI-2

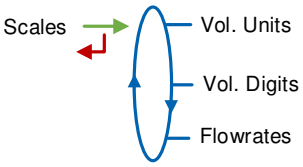
Turbine: Set the serial number of the turbine meter

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

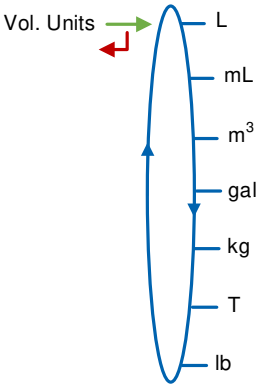
7.2 Menu Config.



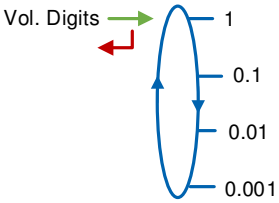
7.2.1 Sub-menu Scales



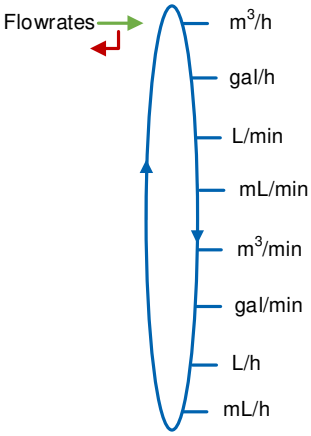
Vol. Units: Select the unit of the volume.



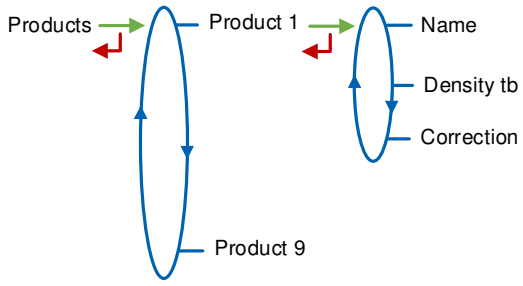
Vol. Digits: Select the accuracy of the volume.



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



7.2.2 Sub-menu Products



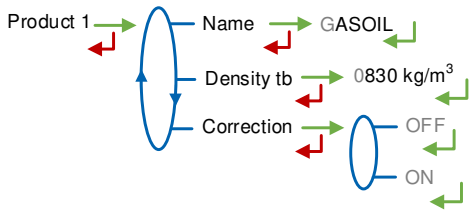
You can configure 9 different products.

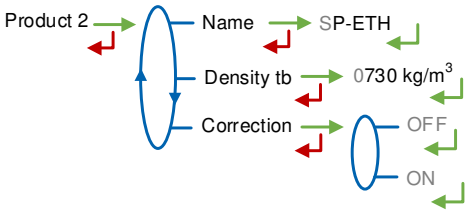
Name: Enter the product name (max 8 alphanumeric characters)

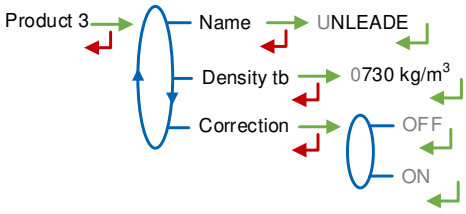
Density tb: Enter the density in kg/m^3 in base conditions (min: 550 max: 1100). Set 0000 to remove the product from the list displayed in USER mode

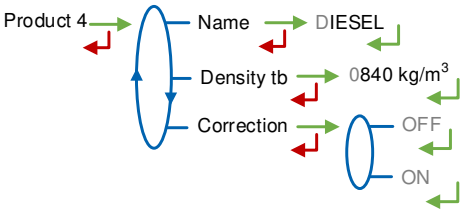
Correction: Select if the correction is on or off for the product. If Density tb≤750 → Correction=ON. Otherwise→ Correction=OFF

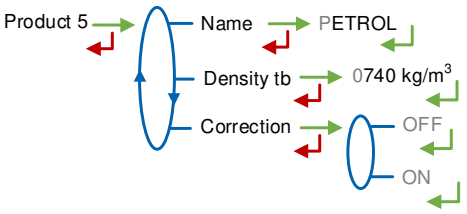
The UNI-2 is configured as follows:

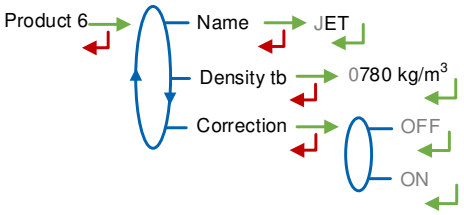


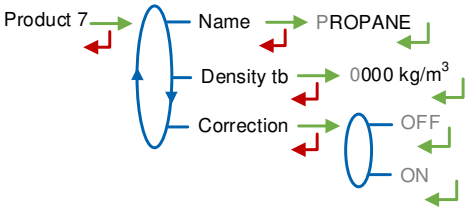


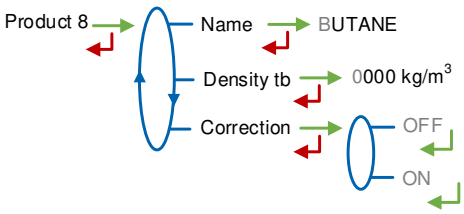


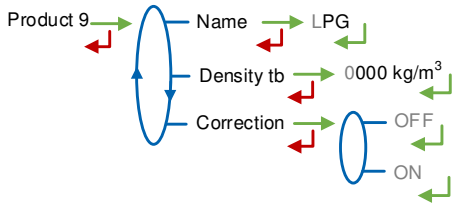




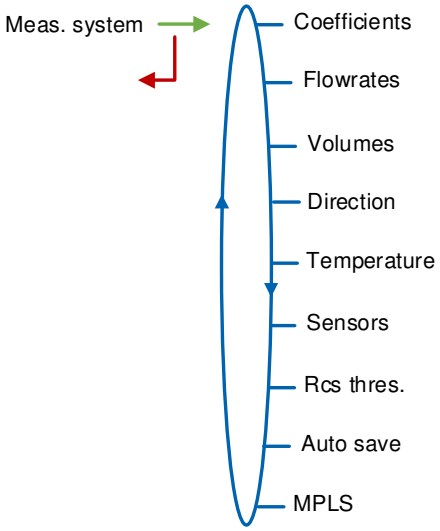








7.3 Menu Meas. System



7.3.1 Sub-menu Coefficients

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

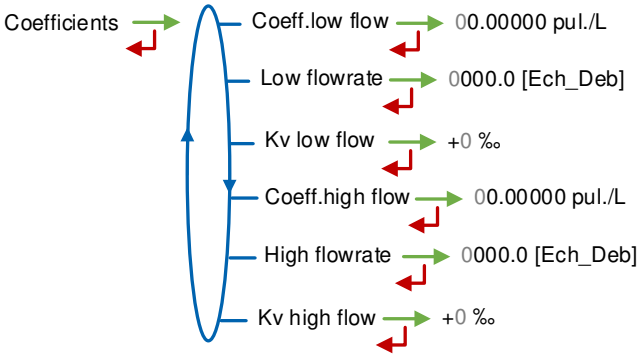
Low flowrate: Flowrate corresponding to Coeff.low flow. Unit depends on the configuration (Config.>Scales>Flowrates)

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

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

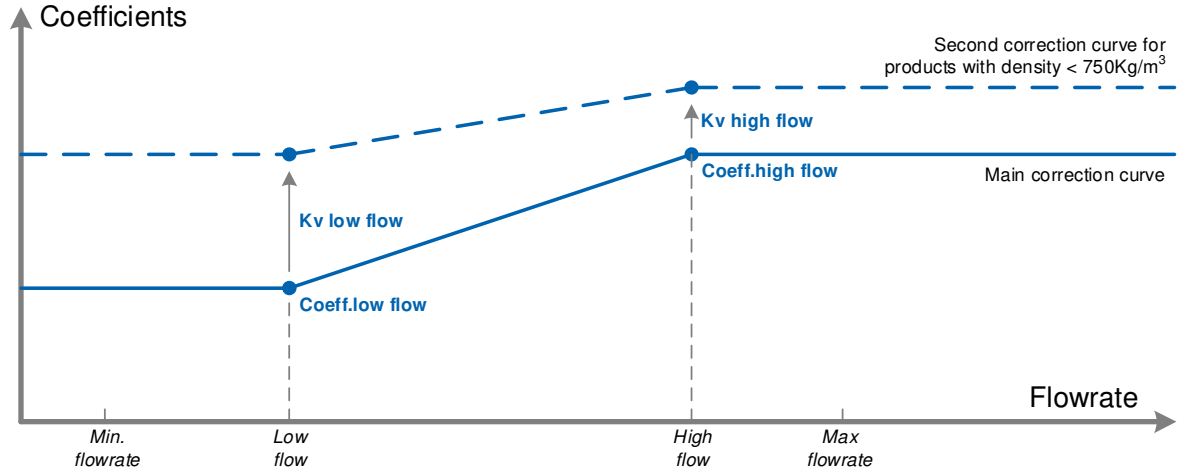
High flowrate: Flowrate corresponding to Coeff.high flow. Unit depends on the configuration (Config.>Scales>Flowrates)

Kv high flow: Correction coefficient (‰) at high flowrate for low viscosity products



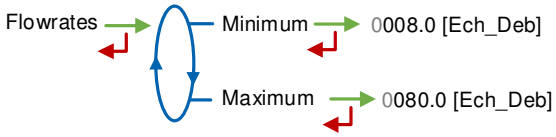
When parameters **Low flowrate** and **High flowrate** are set to zero, parameters **Coeff.high flow** and **Kv high flow** are not applied.

Adjustment of coefficients for several flowrates:



Coefficients applied in accordance with flowrate and product density

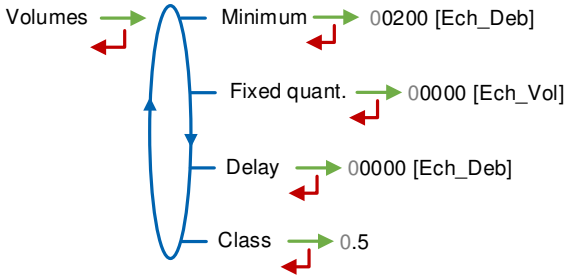
7.3.2 Sub-menu Flowrates



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

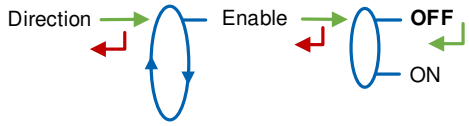
Fixed quant.: End of counting fixed volume of the FLEXICOMPT AUTONOME+. Unit depends on the choice made for the scale interval. Not applicable without gas detectors

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

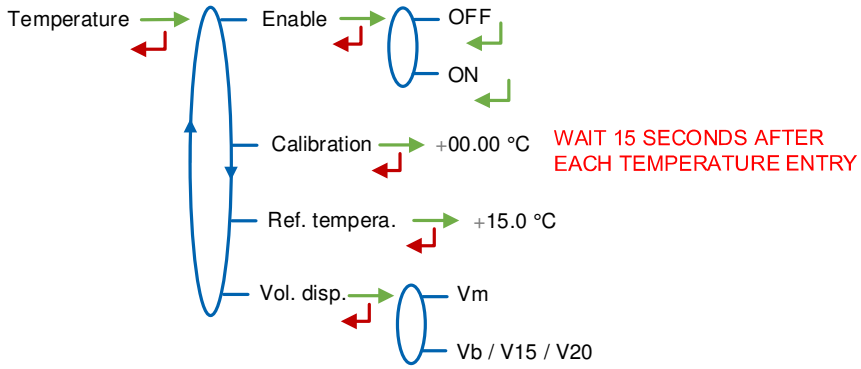
Do not enable this feature.



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:

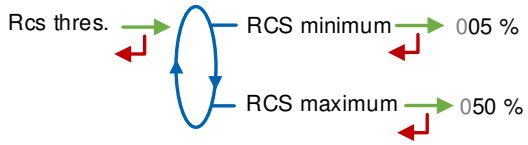
- **Vm**: Volume in metering conditions
- **Vb**: Volume converted to the reference temperature

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).

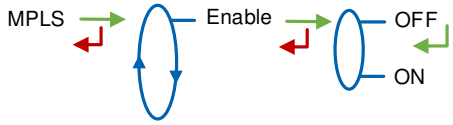
- Auto Save=0: Data recording is manual, it is done by pressing RESET. It causes the volume reset.
- Auto Save>1: Data recording is automatic, it is done when the time-out is up. The RESET key is disabled. The volumes counted during the time-out are added at recording of the measurement data.

  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

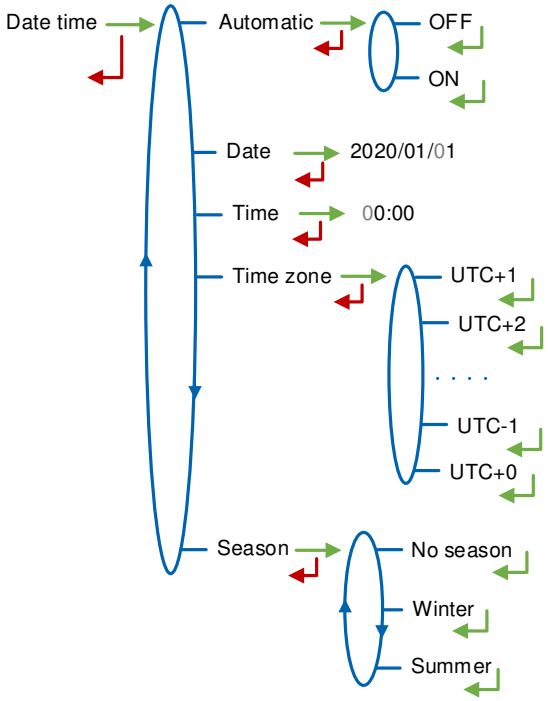
Do not enable this feature.



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 yyyy/mm/dd. You can change the date format in USER mode with the menu Supervisor>Date time>Date format

Time: Set the time hour:minutes (hh:mm)

Time zone: Set the jet lag related to the time zone. E.g.: validate UTC+1 for the Brussels, Copenhagen, Madrid, Paris time zone

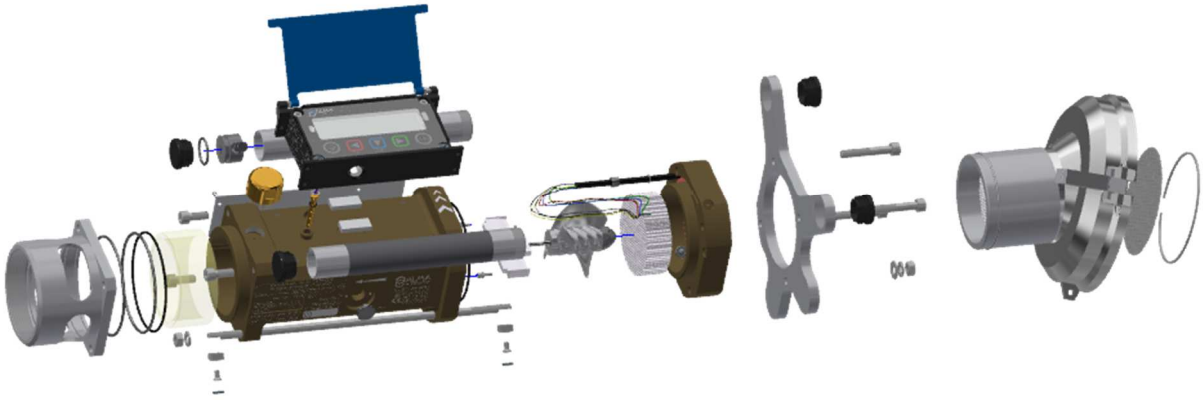
Season:

- **OFF**: 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>Date time>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

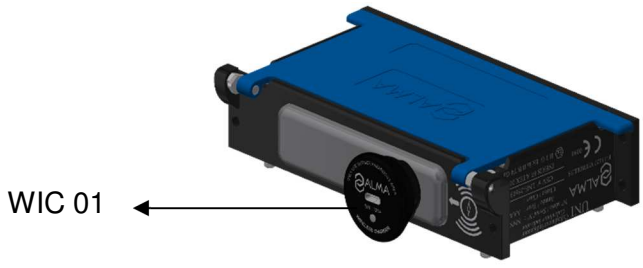
It is made of a box with an intrinsic safety electronic board set by 4 CHC screws (diameter of 4 mm) on the body of the turbine meter. An O-ring is the seal between the casing and the turbine meter. Make sure that it is in its groove and well lubricated before tightening the screws.

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. Only charge batteries outside potentially explosive area and only use the USB cable and the charging module WIC 01, supplied with the equipment.



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+.

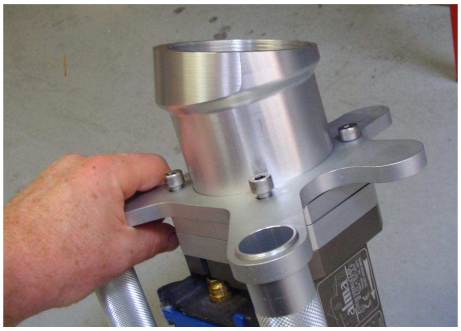
8.2 Hydraulic sleeve

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.

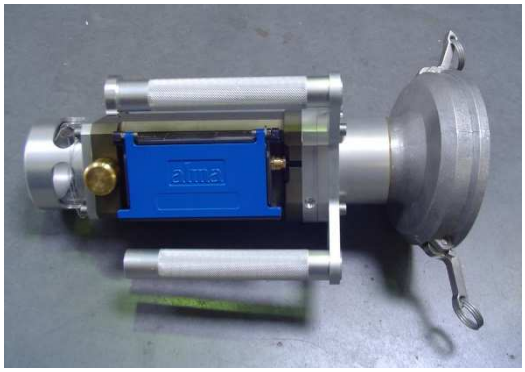
- Position the upstream coupling so that in use the downstream coupling is in the lowest position than the upstream coupling
- Position the upstream coupling as laid down the drawing and the pictures below
- Ensure a good sealing
- Check that the straining sieve and honeycombs are clean (at the entrance 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

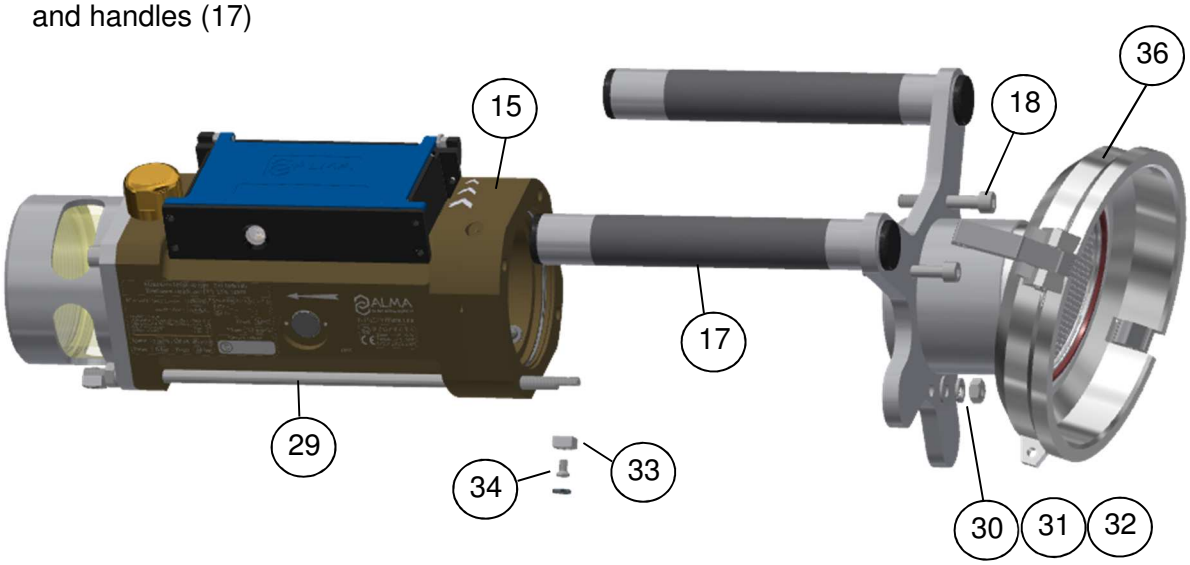
Positioning the API coupler



8.3 2DLA01-spacer

8.3.1 Removing the upstream coupling

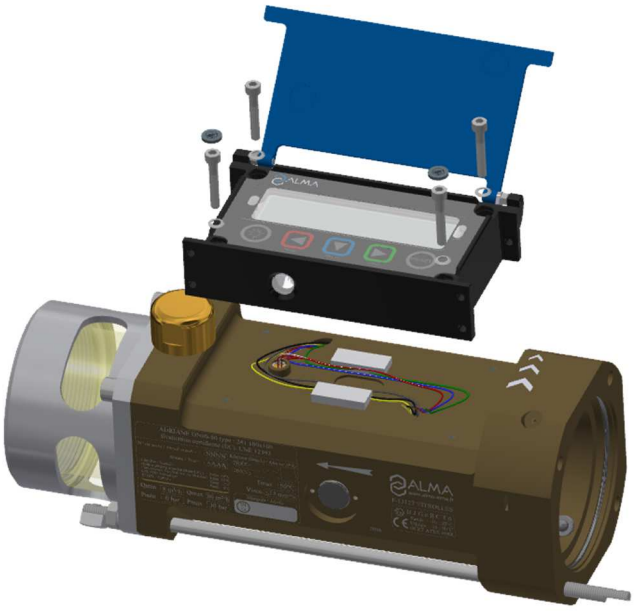
- Remove the seal* from the upstream end of the threaded rod (29)
- Unscrew the screw (34) and remove the lead seal cup (33)
- Unscrew the nut (30) from the threaded rod (29) and remove the washers (31) and (32)
- Unscrew the 3 screws (18)
- Remove from the 2DLA01-spacer (15) the API coupler set (36)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

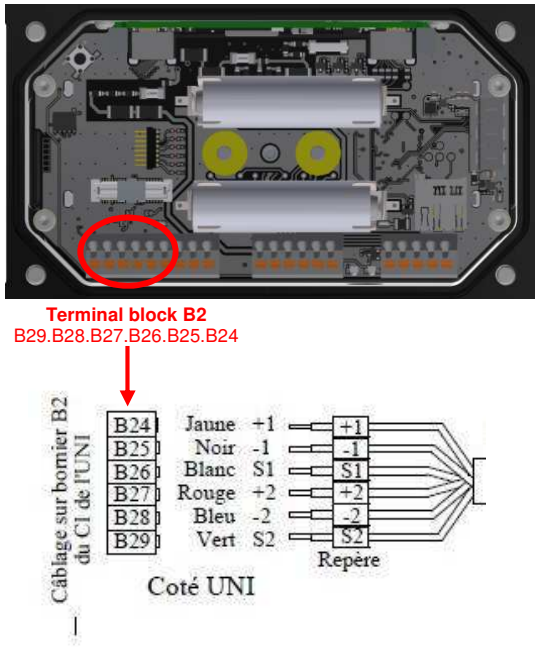


8.3.2 Removing the 2LA01-spacer from the UNI-2

- 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*)



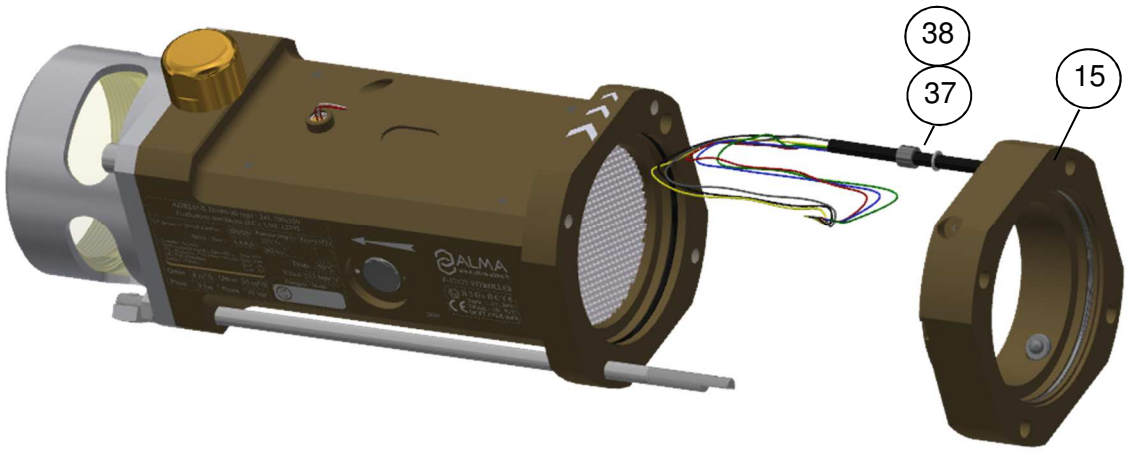


Picture A

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



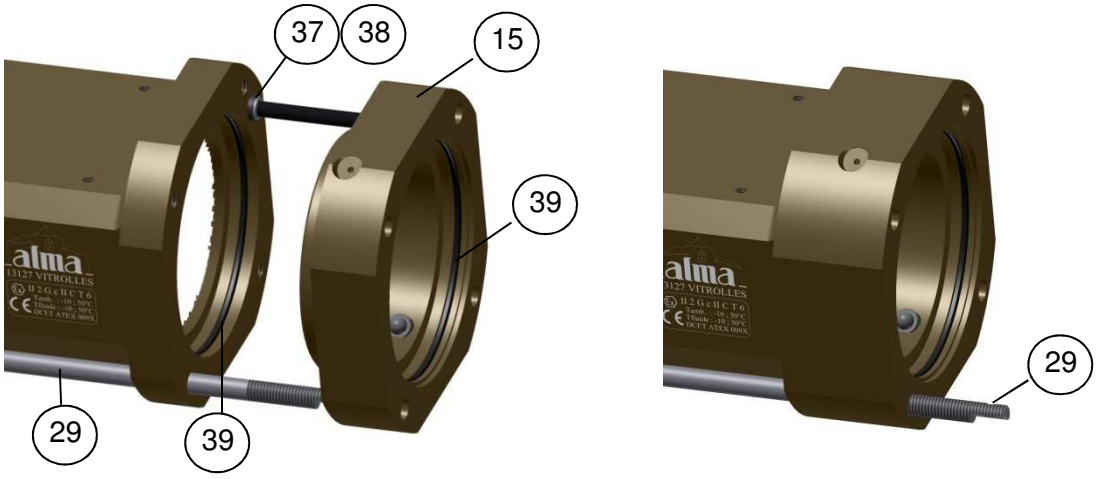
8.3.4 Setting of the new 2DLA01-spacer

❍ 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

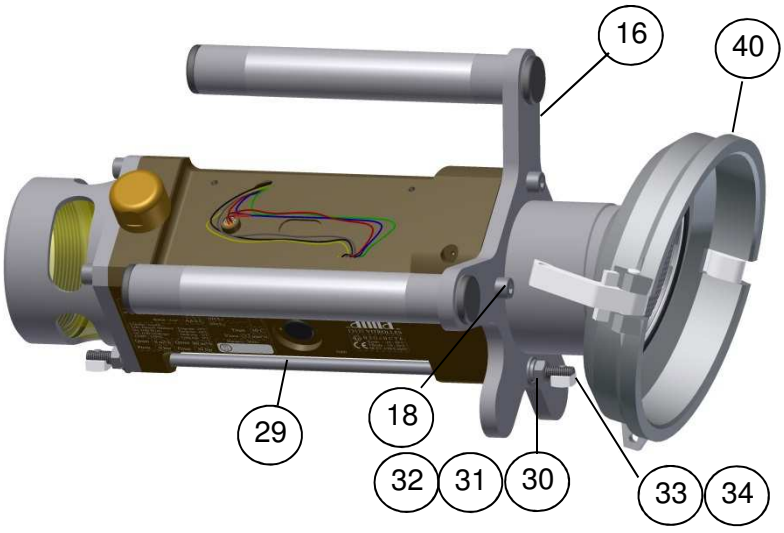
❍ Pass the 6 wires and then the cable through the wires pass through of the turbine body

- 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

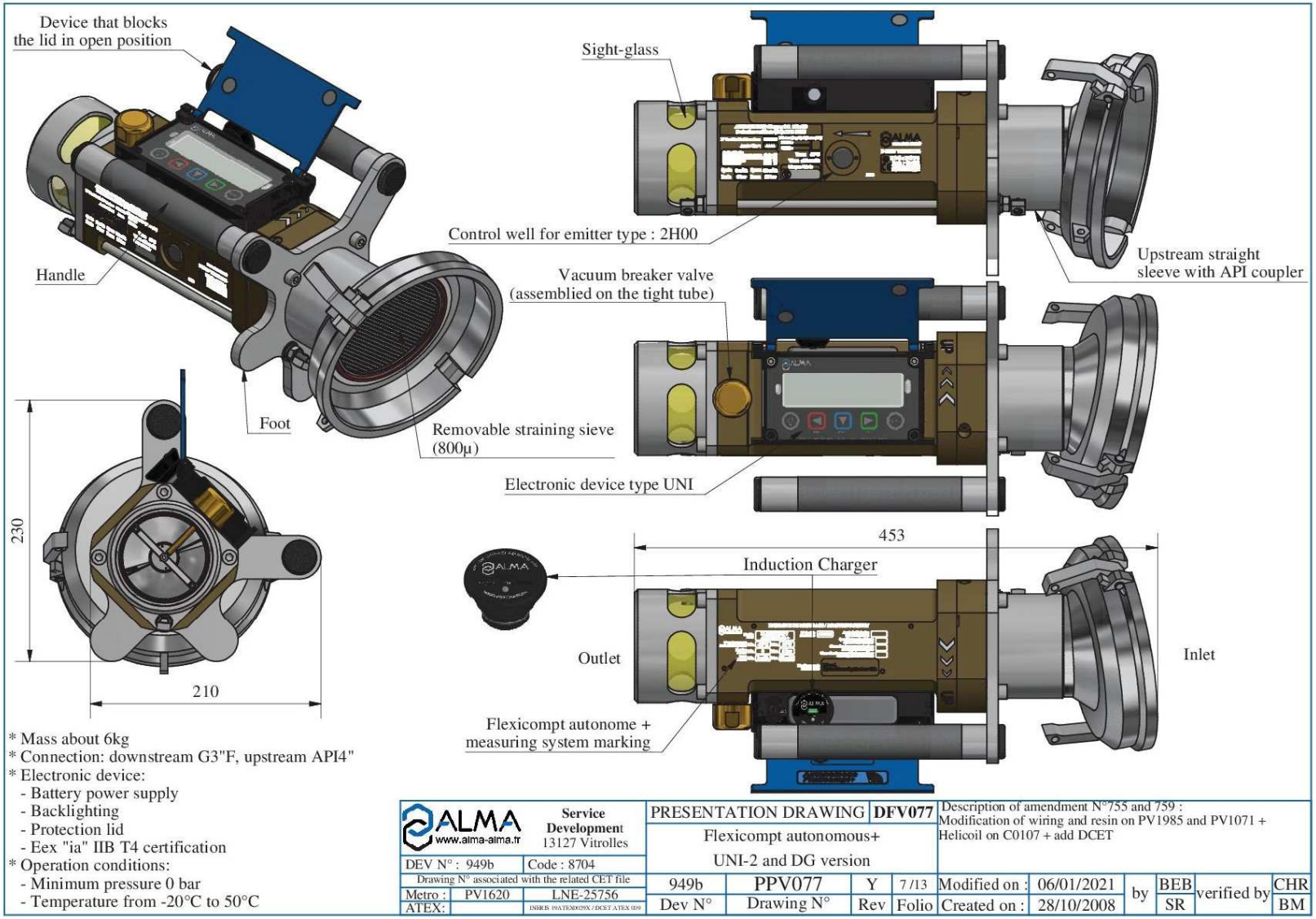
- Put the sheet back on the battery and make sure it's well-positioned in the base holder
- Put back the holder and the top cover
- Screw the 4 screws

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:

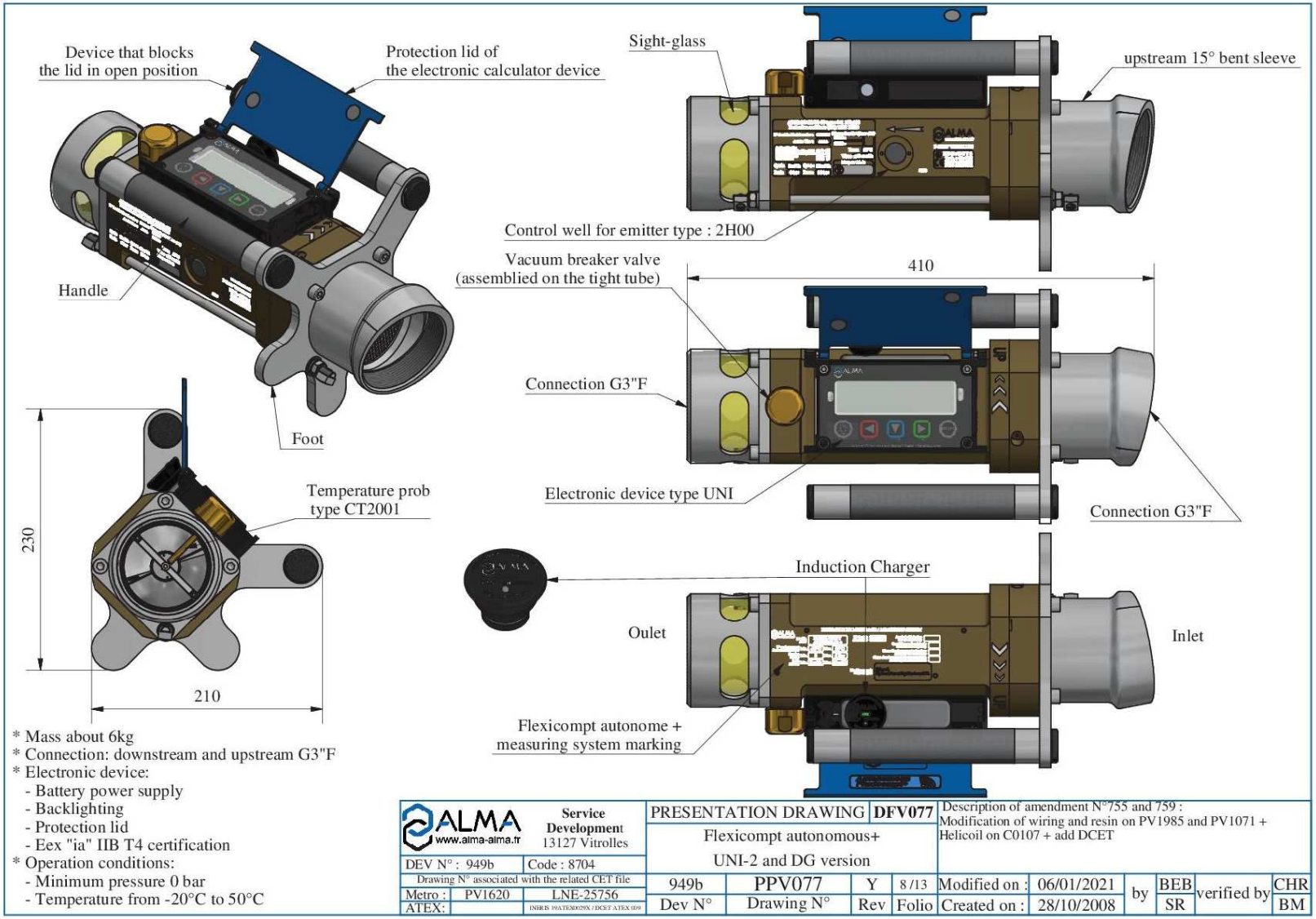
⇨ An upstream straight sleeve with API coupler

⇨ An upstream 15° bent sleeve.



* Mass about 6kg
* Connection: downstream G3"F, upstream API4"
* Electronic device:
  - Battery power supply
  - Backlighting
  - Protection lid
  - Eex "ia" IIB T4 certification
* Operation conditions:
  - Minimum pressure 0 bar
  - Temperature from -20°C to 50°C

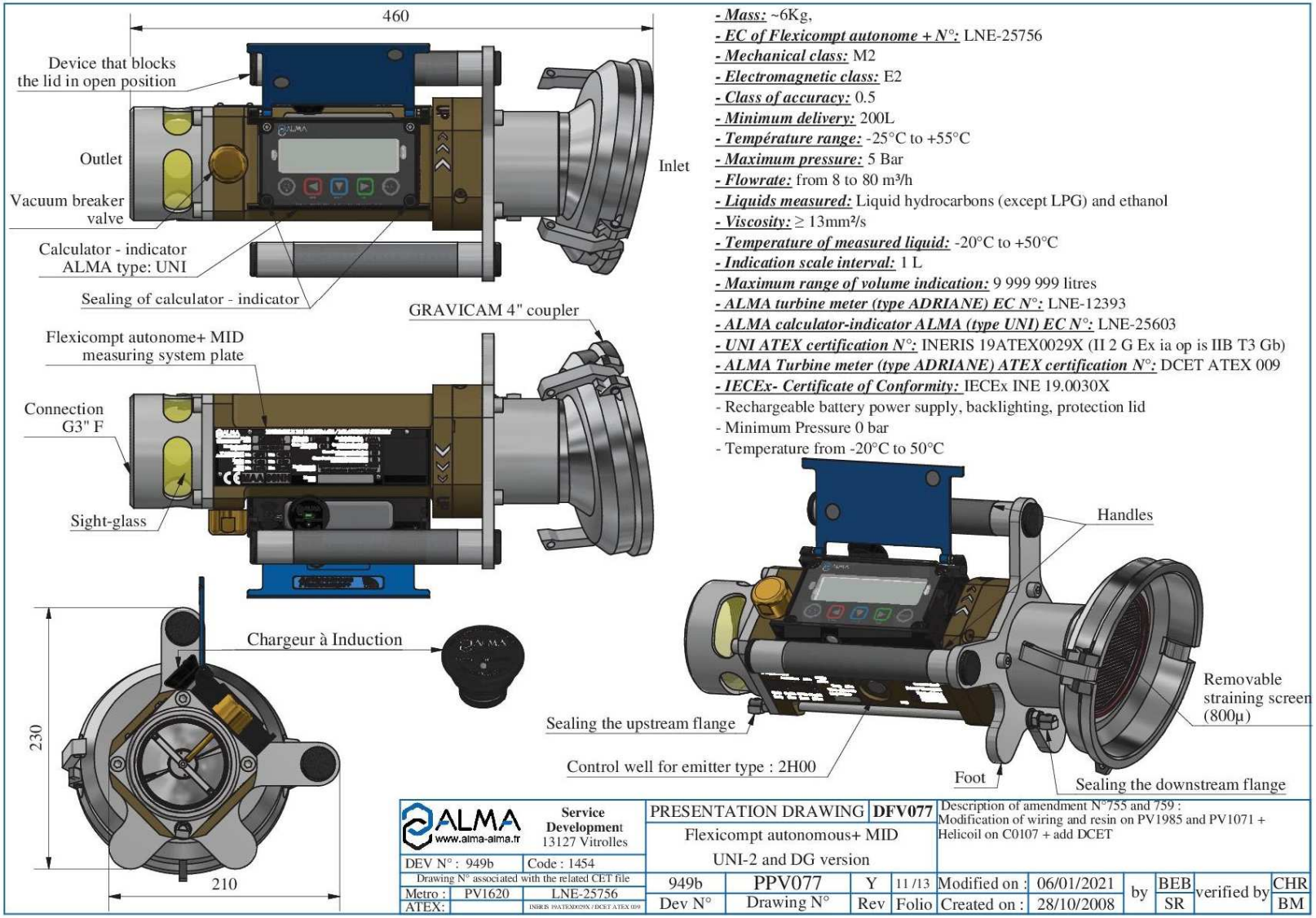
ALMA www.alma-alma.fr	Service Development 13127 Vitrolles	PRESENTATION DRAWING	DFV077	Description of amendment N°755 and 759 : Modification of wiring and resin on PV1985 and PV1071 + Helicoil on C0107 + add DCET							
DEV N° : 949b	Code : 8704	Flexicompt autonomous+ UNI-2 and DG version									
Drawing N° associated with the related CET file		949b	PPV077	Y	7 /13	Modified on :	06/01/2021	by	BEB	verified by	CHR
Metro : PV1620	LNE-25756	Dev N°	Drawing N°	Rev	Folio	Created on :	28/10/2008		SR		BM
ATEX:	INERIS 19ATEX0029X / IDCET ATEX 039										



* Mass about 6kg
* Connection: downstream and upstream G3"F
* Electronic device:
- Battery power supply
- Backlighting
- Protection lid
- Eex "ia" IIB T4 certification

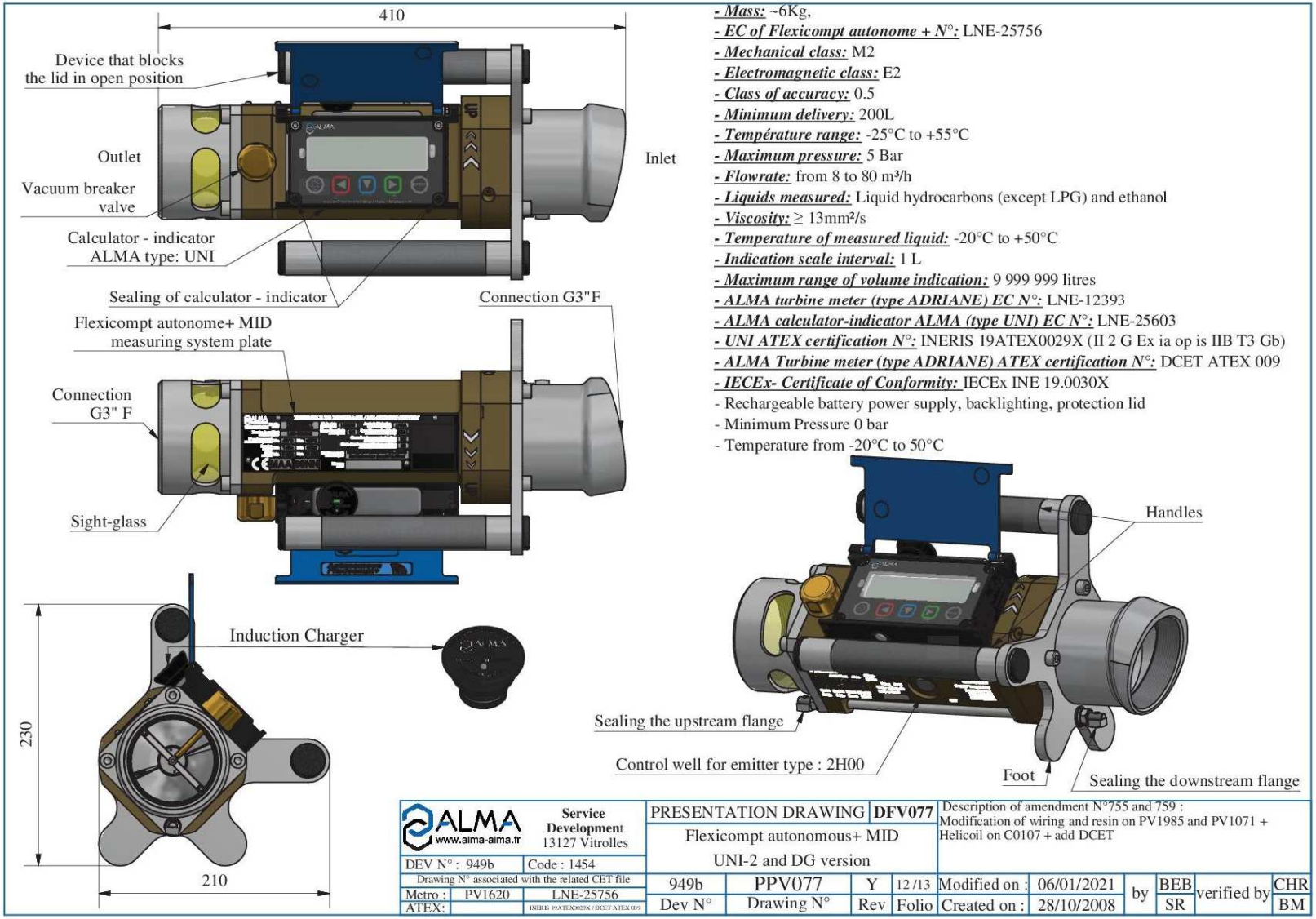
* Operation conditions:
- Minimum pressure 0 bar
- Temperature from -20°C to 50°C

ALMA www.alma-alma.fr	Service Development 13127 Vitrolles	PRESENTATION DRAWING	DFV077	Description of amendment N°755 and 759 : Modification of wiring and resin on PV1985 and PV1071 + Helicoil on C0107 + add DCET							
DEV N° : 949b	Code : 8704	Flexicompt autonomous+ UNI-2 and DG version									
Drawing N° associated with the related CET file		949b	PPV077	Y	8 /13	Modified on :	06/01/2021	by	BEB	verified by	CHR
Metro : PV1620	LNE-25756	Dev N°	Drawing N°	Rev	Folio	Created on :	28/10/2008		SR		BM
ATEX:	INERIS 19ATEX0029X / IDCET ATEX 039										



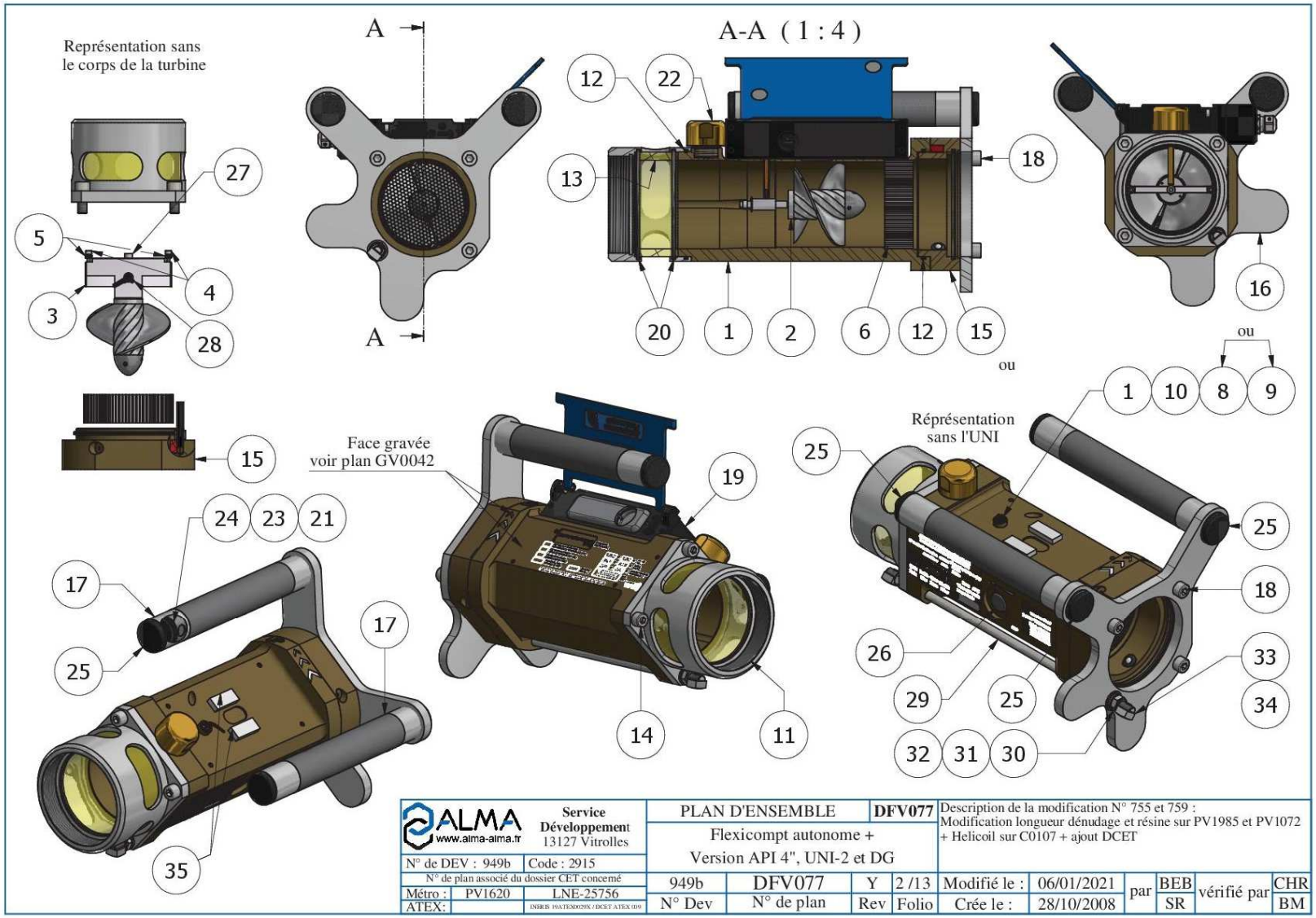
- ***Mass:*** ~6Kg,
- ***EC of Flexicompt autonome + N°:*** LNE-25756
- ***Mechanical class:*** M2
- ***Electromagnetic class:*** E2
- ***Class of accuracy:*** 0.5
- ***Minimum delivery:*** 200L
- ***Température range:*** -25°C to +55°C
- ***Maximum pressure:*** 5 Bar
- ***Flowrate:*** from 8 to 80 m³/h
- ***Liquids measured:*** Liquid hydrocarbons (except LPG) and ethanol
- ***Viscosity:*** ≥ 13mm²/s
- ***Temperature of measured liquid:*** -20°C to +50°C
- ***Indication scale interval:*** 1 L
- ***Maximum range of volume indication:*** 9 999 999 litres
- ***ALMA turbine meter (type ADRIANE) EC N°:*** LNE-12393
- ***ALMA calculator-indicator ALMA (type UNI) EC N°:*** LNE-25603
- ***UNI ATEX certification N°:*** INERIS 19ATEX0029X (II 2 G Ex ia op is IIB T3 Gb)
- ***ALMA Turbine meter (type ADRIANE) ATEX certification N°:*** DCET ATEX 009
- ***IECEx- Certificate of Conformity:*** IECEx INE 19.0030X
- Rechargeable battery power supply, backlighting, protection lid
- Minimum Pressure 0 bar
- Temperature from -20°C to 50°C

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		PRESENTATION DRAWING	DFV077		Description of amendment N°755 and 759 : Modification of wiring and resin on PV1985 and PV1071 + Helicoil on C0107 + add DCET						
DEV N° : 949b	Code : 1454	Flexicompt autonomous+ MID UNI-2 and DG version									
Drawing N° associated with the related CET file											
Metro : PV1620	LNE-25756	949b	PPV077	Y	11 /13	Modified on :	06/01/2021	by	BEB	verified by	CHR
ATEX:	INERIS 19ATEX0029X / DCET ATEX 009	Dev N°	Drawing N°	Rev	Folio	Created on :	28/10/2008		SR		BM



- ***Mass:*** ~6Kg,
- ***EC of Flexicompt autonome + N°:*** LNE-25756
- ***Mechanical class:*** M2
- ***Electromagnetic class:*** E2
- ***Class of accuracy:*** 0.5
- ***Minimum delivery:*** 200L
- ***Température range:*** -25°C to +55°C
- ***Maximum pressure:*** 5 Bar
- ***Flowrate:*** from 8 to 80 m³/h
- ***Liquids measured:*** Liquid hydrocarbons (except LPG) and ethanol
- ***Viscosity:*** ≥ 13mm²/s
- ***Temperature of measured liquid:*** -20°C to +50°C
- ***Indication scale interval:*** 1 L
- ***Maximum range of volume indication:*** 9 999 999 litres
- ***ALMA turbine meter (type ADRIANE) EC N°:*** LNE-12393
- ***ALMA calculator-indicator ALMA (type UNI) EC N°:*** LNE-25603
- ***UNI ATEX certification N°:*** INERIS 19ATEX0029X (II 2 G Ex ia op is IIB T3 Gb)
- ***ALMA Turbine meter (type ADRIANE) ATEX certification N°:*** DCET ATEX 009
- ***IECEx- Certificate of Conformity:*** IECEx INE 19.0030X
- Rechargeable battery power supply, backlighting, protection lid
- Minimum Pressure 0 bar
- Temperature from -20°C to 50°C

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		PRESENTATION DRAWING	DFV077		Description of amendment N°755 and 759 : Modification of wiring and resin on PV1985 and PV1071 + Helicoil on C0107 + add DCET						
DEV N° : 949b	Code : 1454	Flexicompt autonomous+ MID UNI-2 and DG version									
Drawing N° associated with the related CET file		949b	PPV077	Y	12 /13	Modified on :	06/01/2021	by	BEB	verified by	CHR
Metro : PV1620	LNE-25756	Dev N°	Drawing N°	Rev	Folio	Created on :	28/10/2008		SR		BM
ATEX:	INERIS 19ATEX0029X / DCET ATEX 009										



ALMA www.alma-alma.fr	Service Développement 13127 Vitrolles	PLAN D'ENSEMBLE		DFV077		Description de la modification N° 755 et 759 : Modification longueur dénudage et résine sur PV1985 et PV1072 + Helicoil sur C0107 + ajout DCET					
		Flexicompt autonome + Version API 4", UNI-2 et DG									
N° de DEV : 949b	Code : 2915										
N° de plan associé du dossier CET concerné											
Métro : PV1620	LNE-25756	949b	DFV077	Y	2 /13	Modifié le :	06/01/2021	par	BEB	vérifié par	CHR
ATEX:	INERIS 19ATEX0029X / DCET ATEX 039	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	2DLA01-fitted spacer
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
GU 7094	Operating guide: INSIDE App
MU 7087	User manual: Non ATEX mobile printer kit
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