OPERATING MANUAL

MU 7036 EN H

MICROCOMPT+ LOADING TERMINAL DEVICE

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1 GENERAL PRESENTATION AND DESCRIPTION

The electronic calculator-indicating device MICROCOMPT+ for loading terminal is intended to be fitted on measuring systems to measure liquids other than water such as hydrocarbons. It is usually used for loading tank trucks or rail tankers.

It can be used for top loading and bottom loading. Specific functions are identified **BOTTOM** or **TOP**, later in the document.

The electronic calculator-indicating MICROCOMPT+ terminal device calculates and displays:

- \Rightarrow Either volume (or mass) in metering conditions Vm
- \Rightarrow Or volume converted to base conditions Vb.

It can take into account the temperature of liquid when it's measured by a PT100 temperature sensor, and the density when it's acquired by a density transducer.

The DUAL version calculates and displays volume in metering conditions or mass, measured by **two measuring systems that can operate simultaneously**: EMA for the principal product and EMB for the secondary product (for blending or metrological denaturation).

For **BOTTOM** and **TOP** applications, there may be metrological denaturation. In that case the denaturation can be systematic or optional (the basic product is delivered without any denaturant or with a single and regulated denaturant rate). Note: additivation, dyeing and non-metrological denaturation are made with injectors #3 to #6.

If injection is not systematic, pollution of the basic product with the injected product is avoided by the use of an anti-pollution valve.

The MICROCOMPT+ controls a non-resettable totaliser for each measuring system (EMA and EMB).

It memorizes and secures measurement information, which is read from the user interface.

It registers accumulated masses or volumes in metering conditions and/or accumulated volumes in base conditions on an index.

Two serial links are available to communicate with external equipment (mechanical printer, supervision device).

The front of the MICROCOMPT+ is made of:

- A liquid crystal display (LCD) which is used to display a 6-digit signed quantity and pictograms for units
- ⇒ A prompter: line of 20-alphanumeric characters for comments
- \Rightarrow 3 pushbuttons
- ⇒ A metrological electronic seal
- \Rightarrow An internal switch operated with an ALMA magnetic key.

NOTE: If MICROCOMPT+ communicates with a system via μ Config, the message 'UCONFIG...' appears on the prompter. μ Config is an optional additional tool on PC to access the MICROCOMPT's configuration.

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The electronic calculator-indicating device MICROCOMPT+ has a flameproof case.



SUPERVISOR ALMA magnetic key to access configuration and calibration menu

2 OPERATING MODES OF THE INDICATING DEVICE

USER MODE

This mode is for ongoing operations of the device. Refer to USER MODE.

SUPERVISOR MODE

To access the SUPERVISOR mode, the ALMA magnetic key must be set at the right of the MICROCOMPT+ display. This mode is used to set or change parameters for ongoing operations of the device.

Refer to SUPERVISOR MODE for setup.

METROLOGICAL MODE

To access the METROLOGICAL mode, the MICROCOMPT+ has to be unsealed. Only an authorized person can remove the seal. It's done at the putting into use of the measuring system and sometimes during metrological controls.

This mode allows setting all functional and metrological parameters. The physical characteristics of the equipment, its instrumentation and its use are taken into account Refer to METROLOGICAL MODE for configuration.

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3 USER MODE



3.1 Loading

Loading authorization is given by the MICROCOMPT+ on condition that the loading security devices are connected. The loading authorization must have been received by the MICROCOMPT+ from the main computer (communication mode=connected).

Loading security devices are different according to the installation and application:

BOTTOM. Main security devices are: ground, overfill probe, vapor arm, loading arm, authorization.

TOP. Main security devices are: ground, arm position, authorization.

In case of disconnection, the MICROCOMPT+ displays the related alarm alternatively with le volume already loaded. Reconnect the device and press green pushbutton to acknowledge the alarm.



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3.2 Menu DISPLAY



3.2.1 Menu TOTALISER

Totalisers for the principal product (EMA) and the secondary product (EMB) are displayed in this menu. Pictograms indicate the concerned measuring system.



3.2.2 Menu DIARY

Display sequence of measurement results memorized by the MICROCOMPT+

LIST: Display all the measurement details recorded, from the newest to the oldest, sorted by day then by measurement number

SELECTION: Display a specific measurement by selecting the day number

For each measurement, are displayed: the measured volume, the blending rate (with EMB) and the temperature (with active option).



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3.2.3 Menu PARAMETERS

The parameters that are displayed depend on the MICROCOMPT+ configuration.



3.3 List of alarms

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воттом		DISPLAY	MEANING	ACTION
		STOP LOADING	Intentional interruption of the loading operation	Continue or stop the loading operation
		EMERGENCY STOP	Detection of an emergency stop	Check the status of the emergency stop
		COMMUNICATION FAULT	Absence of communication network	Check the status on the control device
		POWER SUPPLY PROBLEM	Power outage during discharge	Check the cause / Restore power supply
		LOW FLOW FAULT	Low flowrate (less than minimum flowrate)	Check the parameters / Check the hydraulic system (valve, strainer, nozzle)
		HIGH FLOW FAULT	High flowrate (greater than maximum flowrate)	Check the hydraulic system (valve, pumping)
		ZERO FLOW FAULT	Zero flow principal product	Check the hydraulic system (safety valve)
		METERING PROBLEM	Metering problem with the principal measuring device	Check if the pulse transmitter is powered (red indicators)
		OVERFILL FAULT	Over-filling of the compartment	Dry out the wet probe or end measurement
		MANDATORY END	Measurement end is required	End operation
		NO MORE AUTHORISATION	No more loading authorisation	Check the reason on the control device
		GROUND FAULT	Loss of ground signal	Check the connection of the dead-man switch
		VAPOR ARM FAULT	Loss of vapor arm signal	Check the connection of the vapor arm
		TICKET FAULT	No ticket in the local mechanical printer	Check the ticket is well-positioned
		DTQM FAULT	Stop requested by the DTQM system	Deal with the problem on the DTQM/LR system
		LEAKAGE FAULT	Metering detection without measurement	Check the tightness of the loading valve
		SAMPLING FAULT	Problem with the sampler	Check the status of the sampler
		SELECTION QUALITY	No product selected	Choose a product
		GAS DETECTED	Detection of gas (principal product circuit EMA)	Make a purge (manual or automatic)
R		EMB METERING PROBLEM	Metering problem with the secondary measuring device	Check if the pulse transmitter is powered (red indicators)
μ		EMB NO FLOWRATE	Zero flow (secondary measuring system)	Check the hydraulic system (safety valve)
S S		BLENDING RATE FAULT	Inappropriate blending ratio	Check the blending rate set in metrological mode
		EMB LEAKAGE FAULT	Metering detection without injection of secondary product	Check the hydraulic system of the denaturant
		BLENDER FAULT	Problem with the denaturant electronic device	Check the denaturant electronic device
		EMB UNDERFLOW	Flowrate less than the min. flowrate set in metrological mode	Check the hydraulic system (valve, strainer, nozzle)
		EMB HIGH FLOW	Flowrate greater than the max. flowrate set in metrological mode	Check the hydraulic system (valve, pumping)
			Detection of gas (secondary product circuit EMB)	Make a purge (manual or automatic)
		BLENDER GAS FAULT	Detection of gas	Make a purge (manual or automatic)
		DENATOR. TANK EMPTY		Fill the tank with denaturant
			Dyeing nui Matarian datastism without islantism	Check the additive hydraulic system
				Check the additive hydraulic system
			Dyeing rate too low	Check the additive hydraulic system
			Additivation null	Check the additive hydraulic system
		ADDITIVE LEAKAGE	Metering detection without injection	Check the additive hydraulic system
		ADDITIVATION <>	Additivation rate too low	Check the additive hydraulic system
		ADDITIVATION <+++>	Additivation rate too high	Check the additive hydraulic system
		ADDITIVATION FAULT	Problem with the additivation electronic device	Check the additivation electronic device
		DIARY FAULT	Reset of the events diary	Acknowledge the alarm, check the date in supervisor mode
		LINE RINSING FALLET	Rinsing cycle not finished by the injector	Wait for the end of the rinsing cycle. Blocking default if the injector is
				for denaturant (see ANTI BLENDING configuration)
		INJECT. LEAKAGE	Metering detection on injector XX without injection	Check the additive hydraulic system
			Problem with display card	If steady alarm, substitution of the display card
			Fault with display of power card of AFSEC+ card	If steady alarm, substitution of the faulty card
				It steady alarm, substitution of the headure better
	5		LOSS OF TOTALISEF EMA	Substitution of the backup battery
	Ň		Tomporature determination failure EMA	If steady alarm, see a reparator for trouble sheeting
	Ö			If steady alarm, see a reparator for trouble shooting
	BL		Inappropriate reaction of the EMA control valve	If steady alarm, inspect the autorization value
	NO		Inappropriate reaction of the EMB control valve	If steady alarm, rispect the autorization valve
	2	FILTER FAULT	Filter fouling	The pressure switch and the product line must be cleaned
		ANTI-POLLUTION VALVE	Mismatch between the status awaited and the actual status of the antipollution valve	Check the status of the antipollution valve
R		INJECT CONFIG FAULT	Disparity between metrological parameters values	Remove the disparity
Ρ		DYEING CONFIG FAULT	Disparity between metrological parameters values	Remove the disparity
R A		PRINTER FAULT <->	Problem with the IT2 mechanical printer	If steady alarm, inspect the printer
A		PRINTER FAULT <+>	Problem with the IT2 mechanical printer	If steady alarm, inspect the printer
Ē		MEMORY LOST (PILE)	Loss of saved memory	Substitution of the backup battery
		MEMORY LOST	Error on SIM memorization	Enter and exit the METRO mode / If steady alarm, substitution of the backup battery
		COEFFICIENTS FAULT	Deviation between coefficient LF/HF greater than 0.5%	Modification of the low flow coefficient (K1)
	Ŋ	PROM FAULT	Loss of software or resident integrity	Substitution of the AFSEC+ electronic card
	K	RAM FAULT	Saved memory fault	Substitution of the AFSEC+ electronic card
	JL0		Loss or metrological configuration	Substitution of the AFSEC+ electronic card
			Loading diary is full	Substitution of the AFSEC+ electronic card
			Disparity between the software and the version of the nower supply beard	Remove the disparity
		GAS DETECTOR FALLET	Problem with the EMA gas detector	Check the gas detector
		EMB DETECTOR FAULT	Problem with the EMB cas detector	Check the gas detector
		VISCOSITY FAULT	Viscosity out of range	Check the curve in METROLOGICAL mode

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EMEGRANCY STOP CONTRACTOR FALL DWENCTOR FALL DWEN			STOP LOADING	Intentional interruption of the loading operation	Continue or stop the loading operation	
COMMUNITION NULT Address of communication reserved. Device Top VT AND TOP VT A			EMERGENCY STOP	Detection of an emergency stop	Check the status of the emergency stop	
POWER UPPLY TROUGHALT INGE FLOW FAUT TROUCE ADDUCT ALLT ZERO FLOW FAUT TROUCE PAULT ZERO FLOW FAUT TROUCE PAULT ZERO FLOW FAUT TROUCE PAULT ZERO FLOW FAUT TROUCE PAULT ADDUCT PAULT NO NORE ALTHORNATION Membra packets with inspiricular instance and the second approximation of the second approximation of the second approximation of the second approximation of the second approximation of the second approximation of the second			COMMUNICATION FAULT	Absence of communication network	Check the status on the control device	
UNY FLOW FAULT LEW LEW VALT ZERO FLOW FAULT ZERO FLOW FAULT ZERO FLOW FAULT NOTES FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW			POWER SUPPLY PROBLEM	Power outage during discharge	Check the cause / Restore power supply	
High FLOW FALT WETERING PROJECT High Results Note in the provide results Wetering process with no promoting results Wetering with no promoting results with results and results Wetering with results and results Wetering with results and results Wetering with results with results and results Wetering with results with results and resu			LOW FLOW FAULT	Low flowrate (less than minimum flowrate)	Check the parameters / Check the hydraulic system (valve, strainer, nozzle)	
USD Zéro FLOYEALT MARCE PALT OVERTIL FAULT OVERTIL FAULT OVERTIL FAULT OVERTIL FAULT OVERTIL FAULT OVERTIL FAULT OVERTIL FAULT OVERTIL FAULT OVERTIL FAULT ADM DESCRIPTION FOR ADM OVERTIL FAULT ADM DESCRIPTION FOR ADM OVERTIL FOR ADM OVERTIL FOR ADM OVERTIL FAULT FOR ADM OVERTIL FOR ADM OVERTIL FAULT FOR ADM OVERTIL FOR ADM OVERTIL FAULT FOR ADM OVERTIL FOR ADM			HIGH FLOW FAULT	High flowrate (greater than maximum flowrate)	Check the hydraulic system (valve, pumping)	
METERING PRODUCT Memory problem with the proceed measurement on construction of the contraction of the contraction of the comparison of the contraction of the top static protein of the contraction of the top static protein of the contraction of the comparison of the contracontin of the compariso			ZERO FLOW FAULT	Zero flow principal product	Check the hydraulic system (safety valve)	
GUERTLE_NALT Owe-fing of the comparison Dy-out its way prote and measurement NO NORE AUTHORS FOR NO NORE AUTHORSATION NO NO NO NO NO DEVELOSION NO NO NO NO DEVELOSION NO NO NO NO DEVELOSION NO N			METERING PROBLEM	Metering problem with the principal measuring device	Check if the pulse transmitter is powered (red indicators)	
MINDATORY FLOT Measurement and is regurad Each question BIO MARADATORY FLOT No more localing administrom, Localing and micro of the control of the outradication of the outra			OVERFILL FAULT	Over-filling of the compartment	Dry out the wet probe or end measurement	
BY Nome loading advisation Check the reason on the condition lowes BY Nome loading advisation Check the reason on the condition lowes BY Nome loading advisation Check the reason on the condition lowes BY Nome loading advisation Check the reason on the condition lowes BY Nome loading advisation Check the reason on the condition lowes BY Deciden with the finance multiple Check the reason on the condition lowes BY Deciden with the reason multiple Check the reason on the condition lowes BY Deciden with the reason lowes Check the reason on the condition lowes BY Deciden with the reason lowes Check the reason on the condition lowes BY Deciden with the reason lowes Check the reason on the condition lowes BY Deciden with the aminition lowes Check the reason on the condition lowes BY Deciden with the aminition lowes Check the reason on the condition lowes BY Deciden with the aminition lowes Check the reason on the condition lowes BY Deciden with the aminition lowes Check the reason on the condition lowes BY Deciden with			MANDATORY END	Measurement end is required	End operation	
GROUND FALLT ARM POSITION FALLT DRECTION 2 AGOS DEVELOPMENT DEVELOPMENT DEVELOPMENT DEVELOPMENT EXAMPS FALLT DRECTION 2 AGOS DEVELOPMENT EXAMPS FALLT DRECTION 2 AGOS DE			NO MORE AUTHORISATION	No more loading authorisation	Check the reason on the control device	
Under Approximation Check the black in the local organ on the design of the problem with the detection of the amplitude problem with the samples problem			GROUND FAULT	Loss of ground signal	Check the connection of the dead-man switch	
APRIM POSITION FAULT Londing are in high-position APRIM POSITION FAULT Decking are in high-position APRIM POSITION FAULT Decking are in high-position APRIM POSITION FAULT Decking are in high-position APRIM POSITION FAULT Meeting detaction value in security in construction SELECTION OUTLY Non-status SELECTION OUTLY Non-status </td <td></td> <td></td> <td>TICKET FAULT</td> <td>No ticket in the local mechanical printer</td> <td>Check the ticket is well-positioned</td>			TICKET FAULT	No ticket in the local mechanical printer	Check the ticket is well-positioned	
PEGD APM DRECTON # AULT Decked to a basing and not be going and the decked main set is not corrected Decked to a basing and necked (bit or right). Decked the bas			ARM POSITION FAULT	Loading arm in high-position	Check the loading arm position	
BIRECTION / REALT Direction of a coding amon outs in side of the ack. The detail on maximum in the date of the ack. The detail on maximum in the date of the ack. The detail on maximum in the date of the ack. The detail on maximum in the date of the ack. The detail on the date of the ack of the date of the d			ARM DIRECTION FAULT	Problem with the direction of the arm in low-position	Check the loading arm direction (left or right)	
UP DEAD MM SWITCH EAR ACK EFALT SAMELING FALT The dead men anticit Meeting detection without in incommental Problem with he sampler Check the statume such Check the systems of the loading valve Check the system is a statume value Check the system is a statume value system Check the system is a statume value system Check the system is a statume value Check the system is a system is a statume value Check the system is a statume value Che			DIRECTION /2 RACKS	Detection of a loading arm on both sides of the rack	Check the loading arm direction (left or right)	
LEAKAGE FAULT Meening descion which measurement settlem of the settlem			DEAD MAN SWITCH	The dead man switch is not connected	Check the dead man switch	
SAME US FAULT Problem with the sampler Check the status of the sampler GAS DETECTED Detection of gas (procept inside roles allow) Make a purg (manai or automatic) BLE NOT FLOWARTE Zaro flow (scondary measuring system) Check the hydralic system (driving value) EVENDER FAULT Meeting processing system) Check the hydralic system (driving value) EVENDER FAULT Meeting processing system) Check the hydralic system (driving value) EVENDER FAULT Meeting processing system) Check the hydralic system (driving value) EVENDER FAULT Meeting processing system) Check the hydralic system (driving value) EVENDER GAS FAULT Detection of gas (scondary system) Check the hydralic system (driving value) EVENDER GAS FAULT Detection of gas (scondary system) Check the hydralic system (driving value) DETENG GAS FAULT Detection of gas (scondary system) Check the hydralic system DYE ILG ANGE Meering shetton with to indiving the storing Check the hydralic system DYE ILG ANGE Meering shetton with to indiving the storing Check the hydralic system DYE ILG ANGE Meering shetton with to indiving the storing Check the dadive hydralic system			LEAKAGE FAULT	Metering detection without measurement	Check the tightness of the loading valve	
SELECTION ON ALTY No potent selected Occose and participation BUD EVEN DETECTION Mething profilem with the secondary mesuring splerely back NO FLOW/RNLT Mething profilem with the secondary mesuring splerely heap optimized in the min. Storage is innet optimizing splerely back NO FLOW/RNLT Mething profilem with the secondary mesuring splerely heap optimized in the min. Storage is innet optimized in the optimized is innet optimized in the innet on the optimized in the optimized in the optimized is innet optimized in the optimized in the optimized is innet optimized in the optimized in the innet optimized in the optimized in theoptimized in theoptimized in the optimized in theoptimized in the			SAMPLING FAULT	Problem with the sampler	Check the status of the sampler	
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4 SUPERVISOR MODE



4.1.1 Sub-menu METER

This menu allows you to check the accuracy of the measuring system by calculating the measuring device error and the new corrected coefficient. It is possible then to linearize the curve on 2 measuring points.

First, fill the gauge (DRIVER mode) in high or low flow with predetermination of the volume.

In this menu the volume which is displayed is the volume <u>at metering conditions</u> (one decimal point) even if volume conversion is activated and whatever the principal quantity (Vb or Vm) is.

METER — ENTER CALIBRATION Display the last measurement details for EMA or EMB. Allow to apply a set-flowrate for the next measurement

LINEARISATION/FLOW Display and configurate the flow correction points

4.1.1.1 Enter calibration

Calibration is proposed for both measuring systems:

EMA (for principal product)

EMB (for secondary product).

First, fill the gauge (USER mode) in high or low flow with or without predetermination of the volume.

Switch to SUPERVISOR mode, choose CALIBRATION>METER>ENTER CALIBRATION and validate.

Enter the reference volume (read on the gauge and corrected), then validate.

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The following information is then displayed:

- The signed error in (%)
- The coefficient revised as a function of the error

Enter a new flow rate value if necessary. This set-flowrate is taken into account by the MICROCOMPT+ for the next operation only, thus avoiding the seal removal.



4.1.1.2 Linearisation/Flow

This menu is used to make a flow-correction for two measuring points (at low and high flowrate). The MICROCOMPT+ stores flowrate and coefficient calibrated values in order to define both correction points: at low and high flowrate. Linearisation is proposed only for the principal product (EMA).

When you validate the menu LINEARISARION/FLOW, the calibrated values are displayed; you need to unseal the MICROCOMPT+ to switch in METROLOGICAL mode and enter the values via the EMA>METER COEFFICIENT menu.

To linearize the curve, two tests are necessary. Follow the instructions:

- Fill the gauge in high flow [flow_{min}×3]≤high flow<[flow_{max}], and enter the volume read on the gauge in the menu CALIBRATION>ENTER CALIBRATION as described above
- Fill the gauge in low flow [flow_{min}]≤low flow≤flow_{min}×1.5], enter the volume read on the gauge in the menu CALIBRATION>ENTER CALIBRATION as described above
- Choose CALIBRATION>METER>LINEARISATION/FLOW and validate. It is then
 possible to see the coefficients and the flow rates data for the two tests
 carried out.



If the procedure has failed, the following alarms may be displayed:

- LARGE GAP K1/K2: Correction between both measuring points >0.5%
- FLOWS TOO CLOSE: High flowrate value is out of range. It needs to be: [flow_{min}×3]≤high flow<[flow_{max}]
- LO-FLOW OUT OF RANGE: Low flowrate value is out of range. It needs to be: [flow_{min}]≤low flow≤flow_{min}×1.5]
- ONLY ONE GAUGE: One of the tests has not been done (at low or high flowrate)
- NO VALID GAUGE: Both tests have not been done (at low or high flowrate).

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4.1.2 Sub-menu ADDITIVATION

This menu is used to calibrate the injectors, except the MICRO-BLEND one. At the end of the calibration procedure, enter the true volume to correct the injector coefficient.



4.1.3 Sub-menu EMB

When calibrating an injector of, the MICROCOMPT+ must be unsealed to set the new coefficient which is a metrological parameter.



STEP 1: Conditioning of the gauge

SUPERVISOR>CALIBRATION>EMB (DENATURANT)>FREE FLOW RATE: press green BP1 at least 2 seconds to let denaturant flow. Release BP1 to stop flow.

→ Technician Pushbutton: lets the denaturant flow (gauge conditioning)

STEP 2: Gauging

SUPERVISOR>CALIBRATION>EMB (DENATURANT)>GAUGING PRESET: set the preset volume (Unit: Litre; scale interval: millilitre)

- → Technician Pushbutton: starts the injection of one dose of denaturant inside the gauge
- \rightarrow MICROCOMPT+: stops automatically the injection
- \rightarrow Technician Pushbutton: measures the volume in the gauge.

STEP 3: Calibration

SUPERVISOR>CALIBRATION>METER>ENTER CALIBRATION>CHOOSE EM: choose EMB, enter volume and error. The new coefficient is displayed.

- → Technician Pushbutton: sets volume and error in the MICROCOMPT+
- \rightarrow MICROCOMPT+ calculates and displays of the new coefficient.

STEP 4: Coefficient memorisation.

METRO>EMB (DENATURANT)>COEFFICIENT (P/L): enter the new coefficient.

 \rightarrow Technician Pushbutton: sets the new coefficient in the MICROCOMPT+.

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4.2.1 Sub-menu ADDITIVATION

This menu is for the additivation configuration:

- O INJECTORS CONFIG: configuration of the injectors
- **O** RATE CONFIG: configuration of the additivation general parameters.

ADDITIVATION \longrightarrow \bigwedge INJECTORS CONFIG

ATE CONFIG

4.2.1.1 Injectors configuration

Configuration of the injectors. There may be up to 6 injectors depending on the device configurations and options.

In DUAL version, injectors 1 and 2 are not configurable. However, the name of the injected product may be changed. The other parameters, set in METROLOGICAL mode for denaturation, are on read-only access.

Injectors 3 to 6 are used for additivation, dyeing and non-metrological denaturation.

But if dyeing is forced (METROLOGICAL configuration), values are on readonly access.

		TYPE (<i>XX</i>)	Injector type
← (←		ASSOCIATED INPUT	Input associated to the injector (meter or control)
	— ×	(/NATURE (<i>XX</i>)	Nature of the injected product
	-	X/DENATURANT (XX)	Activation of the functions associated to denaturation. A failure ends the measurement
	;	X/LSL (<i>XX</i>)	LSL input associated to the injector (low level of the denaturant tank)
	, –	1000 L XRANGE VOLUME	Range volume of principal product
	R	15 RINSING (% RANGE)	Rinsing volume as a percentage of range volume
		1000 DOSE (PPM)	Volume of a dose of additive or for a dose of dye
		NAME (XX)	Name of the injected product (injector label)

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a) Type

Choose the injector type:

METERING: metering-type injector (MIV or PAM).

DOSING: dosing-type injector with or without feedback control (GATE PACK, HYROLEC). Enter the piston strokes needed to inject the dose. MICRO BLEND: MICRO-BLEND-type injector connected on COM1.



b) Associated input

Choose the input associated to the injector (meter or control).



c) Nature

Choose the nature of the injected product: additive or dye.

X/NATURE (XX) → NATURE → ADDITIVE NATURE → DYE

d) Denaturant

Choose ON to manage denaturation and to activate the anti-fraud and antiblending functions.



e) LSL

Choose the LSL input associated to the injector of additive, dye or denaturant.

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f) Range volume

Enter the range volume. It needs to be between 200-500 litres of principal product.

g) Rinsing (% range)

Enter the rinsing volume as a percentage of the range volume. It needs to be between 10-30%.



h) Dose

Enter the volume (in millilitres) of the dose to be injected for 1000 litres of product.

1000 001000 X/DOSE (PPM) X/DOSE (PPM)

i) Name

Enter the name of the injected product (6 characters).



4.2.1.2 Rate configuration

This menu is used to configure the additivation minimum and maximum rates beyond which an alarm is triggered.



4.2.2 Sub-menu PRODUCTS



Name of the product that the MICROCOMPT+ displays in USER mode when pre-measuring conditions are met.

Configuration of quality elements (product, additive, dye).

4.2.2.1 Product name

Enter the name of the principal product. Default display: NONE

PRODUCT NAME (XX) → PRODUCT NAME → NONE

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4.2.2.2 Quality list

In autonomous operating mode, quality configuration allows additivation and/or dyeing (according to option). Before beginning measurement, the MICROCOMPT+ displays a list to choose the quality to load.

In case of blending, enter the blending rate using menu (QUAL1)/BLENDER.

In case of additive injection, use the menu (QUAL1)/ADDITIVE to specify:

INJECTOR: the number of the injector assigned

PPM: the additivation rate for 1000 litres of principal product

In case of dye injection, use the menu (QUAL1)/DYE to specify:

INJECTOR: the number of the injector assigned

PPM: the additivation rate for 1000 litres of principal product.



4.2.3 Sub-menu COMMUNICATION

This menu allows to configure the communication with the control device (main computer) if it has not been done in METROLOGICAL mode (METRO>CONFIGURATION>COMMUNICATION>MODE→SUPERVISOR).

AUTONOMOUS: The MICROCOMPT+ operates in autonomous mode (security management) with or without the useful authorisation.

CONNECTED: The MICROCOMPT+ operates with the control device (main computer) with or without the useful authorisation

SEMI AUTONOMOUS: The MICROCOMPT+ operates in autonomous mode (security management) with or without the useful authorisation. The MICROCOMPT+ takes into account the authorisation given by the control device if connected.



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4.2.4 Sub-menu INSTRUMENTATION



4.2.4.1 DTQM - BOTTOM

If the external sealing device on the loading station breaks down, this menu is used to disable the DTQM input. The MICROCOMPT+ enables it again when the problem is solved.

4.2.4.2 Analog valve

This menu is used to adjust the parameters of the 4-20mA analog valve



4.2.5 Sub-menu BLENDER

This menu is useful in DUAL version, if the secondary measuring system has been activated as a blender in METROLOGICAL mode (except when the value is given by the main computer SESAME II). Enter the blending rate.



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4.3 Menu TIME ADJUSTMENT

Date and time are set in METROLOGICAL mode. The hour may be adjusted $(\pm 2h)$ one time a day through this menu.

TIME ADJUSTMENT 14.41 e.g. 14.41 means 2.41 pm



4.4 Menu LANGUAGE

This menu allows you to choose the display language. It is available if a translation catalogue has been uploaded in the MICROCOMPT+.

LANGUAGE (EN) Choose the display language - FR - EN

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5 METROLOGICAL MODE



5.1 Menu INDICATOR REFERENCE

Set the MICROCOMPT+ serial number then the slave number.



5.2 Menu CONFIGURATION



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5.2.1 Sub-menu UNIT AND ACCURACY

Choose volume unit and flow rate unit that will be displayed and printed.







5.2.2.4 DTQM - **воттом**

Operation with or without DTQM.

In case of failure of the DTQM electronic seal, the input can be disabled in SUPERVISOR mode (CONFIGURATION>INSTRUMENTATION>DTQM).

5.2.2.5 Vapor arm - **BOTTOM** Operation with or without vapor arm.



5.2.2.6 Arm connected - BOTTOM

Operation with or without control of the loading arm connection to the truck.



5.2.2.7 Clogging Operation with or without control of the clogging filter fouling. CLOGGING(XX) $CLOGGING \rightarrow OFF$ $CLOGGING \rightarrow ONF$

5.2.3 Sub-menu COMMUNICATION

This menu allows to configure the communication with the control device (main computer).



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5.2.3.1 Mode

Communication mode with the control device (main computer):

SUPERVISOR: The choice will be done in SUPERVISOR mode (CONFIGURATION>COMMUNICATION>MODE).

AUTONOMOUS: The MICROCOMPT+ operates in autonomous mode (security management) with or without the useful authorisation.

CONNECTED: The MICROCOMPT+ operates with the control device (main computer) with or without the useful authorisation

SEMI AUTONOMOUS: The MICROCOMPT+ operates in autonomous mode (security management) with or without the useful authorisation. The MICROCOMPT+ takes into account the authorisation given by the control device if connected.



b) Communication port

Two communication ports are available on the MICROCOMPT+.

COM1: RS485 port. If COM1 is already used to control an MICRO-BLEND additivation device, a ticket mechanical printer or a mass flowmeter, COM1 configuration is useless

COM2: RS485 port

Any protocols are MODBUS data protocol and use the slave number set in INDICATOR REFERENCE menu.

Several protocols can be configured on a same link.

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Configuration of the protocols:

SESAME II: Communication over the ALMA SESAME II network

J METRO: Communication over a metrological diary to retrieve measurement data on the control device (main computer)

PCC: Communication with a PC/PCC on the metrological network

UCONFIG: Communication over the ALMA protocol $\mu\text{Config.}$ It is useful to transferring data between MICROCOMPT+ and the control device (main computer

J BLEND: Blending data of the last operation



5.2.4 Sub-menu LOGIC



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5.2.4.1 Product order

Configuration of 'product request'.

MEASURE: 'Product request' is activated from preset validation to measurement end.

FLOWING: 'Product request' is activated when the valve is operated. The pump starts within 5 seconds (timer).

PRODUCT ORDER (XX) → PRODUCT ORDER→MEASURE PRODUCT ORDER→FLOWING

5.2.4.2 Dyeing

This menu is used to activate and configure dyeing.



5.2.4.3 VARC command

The VARC-output can be used to trigger the safety valve or an alarm.

VARC COMMAND (XX) VARC COMMAND VARC



5.2.4.4 Reset volume – BOTTOM

This menu is used to configure the triggering event that resets the MICROCOMPT+ partial counter.

MEASURE: Reset over measurement ends

TICK+OVERFILL: Reset over disconnection of loading security devices (ground, overfill probe...)

AUTHOR: Reset over authorisation lost





5.2.4.6 Options

Refer to the ANNEXE to have explanations about the codes for the MICROCOMPT+ options configuration



5.2.4.7 Anti-fraud

A presumption of a change of compartment is considered as a fraud. This menu allows you to activate additional injections of denaturant in the case of fraud.



5.2.4.8 Anti-blending

This menu allows you to activate or not control and appearance of a rinsingdefault of the line at the beginning of a measurement

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5.2.5 Sub-menu DUAL

This menu is used for DUAL version to activate the secondary measuring system called EMB which is available for blending or metrological denaturation.





5.3 Menu MEASURING SYSTEM EMA (PRINCIPAL) EMA (PRINCIPAL) METER COEFFICIENT TEMPERATURE GAS DETECTION VALVE +01.0 PULSES OUTPUT (PL) SETTINGS

5.3.1 Sub-menu METER COEFFICIENT



5.3.2 Sub-menu TEMPERATURE

This menu is used to calibrate the temperature into the MICROCOMPT+ for EMA. Depending on the probe, it's possible to:

- Calibrate temperature,
- O Set the minimum temperature below which an alarm is triggered
- O Set the maximum temperature above which an alarm is triggered
- O Decide whether the alarm is locked or not.

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5.3.3 Sub-menu GAS DETECTION

This menu is used to define the gas separator type:

- GAS SEPARATOR ALMA: Check the status of the separator gas detectors. Specify a possible low flow detector.
- INTERRUPTIBLE: Define what kind of gas detectors the separator is equipped with and if a purge device is available.





5.3.4 Sub-menu VALVE

This menu is used to define the valve type: HYDRAULIC: BROOKS-type hydraulic valve (incremental) PNEUMATIC: CAMFLEX-type pneumatic valve (incremental) ANALOG: Analog valve (0-20mA or 4-20mA) NONE: No valve

SINGLE FLOW: Solenoid-type valve (digital without flow control) TWO FLOWRATES: Two-stage valve (digital with 2-flow control)



5.3.5 Sub-menu PULSES OUTPUT

Copy out the volume measured by EMA.

Enter the number of pulses that the MICROCOMPT+ must generate for each counted display-unit.

+01.0 +01.0 PULSES OUTPUT (PL)

5.3.6 Sub-menu SETTINGS

5.3.6.1 Volumes settings

This menu allows you to configure the volume set values.

FIXED QUANTITY: Set the fixed quantity (volume that is not delivered to the customer)

LF→HF:

- PERCENT OF PRESET BOTTOM: Set percent of preset (between 0 and 6%). The threshold of transition from low to high flowrate corresponds to the sum of the volume PERCENT OF PRESET added with the LF→HF VOLUME
- LF→HF VOLUME: Set the volume in liters, beyond which the MICROCOMPT+ switches from low to high flowrate.

 $HF \rightarrow LF$ VOLUME: Set the volume in liters, beyond which the MICROCOMPT+ drives the low flowrate at the end of a preset measurement.

MINIMUM QUANTITY: Set the minimum quantity

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5.3.6.2 Flow rates settings

MINIMUM FLOWRATE: Minimum flowrate below which an alarm is triggered MAXIMUM FLOWRATE: Maximum flowrate above which an alarm is triggered NOMINAL FLOWRATE: Set-flowrate relating to high flowrate regulation.



5.3.6.3 Calibration analog valve

Configuration of the current range of the 4-20 mA output to control the analog valve.





5.4 Menu MEASURING SYSTEM EMB (SECONDARY)

This function is active when CONFIGURATION>DUAL is ON. The secondary measuring system EMB is available for blending or metrological denaturation.



5.4.1 Sub-menu TEMPERATURE

This menu is used to calibrate the temperature into the MICROCOMPT+ for EMB. Depending on the probe, it's possible to:

O Calibrate temperature,



- Set the minimum temperature below which an alarm is triggered
- O Set the maximum temperature above which an alarm is triggered
- Decide whether the alarm is locked or not.



5.4.2 Sub-menu GAS DETECTION

- GAS SEPARATOR: Define what kind of gas detector the separator is equipped with.
- GAS PURGE: Define whether a purge device is available or not.



5.4.3 Sub-menu PULSES OUTPUT

Copy out the volume measured by EMB.

Enter the number of pulses that the MICROCOMPT+ must generate for each counted display-unit.

5.4.4 Sous-menu FUNCTION

Define whether EMB is used for blending or for metrological denaturation.





5.4.4.1 Function→blender



a) Meter coefficient

01.0000 \longrightarrow 01.0000 METER COEFFICIENT

b) Valve

This menu is used to define the valve type: HYDRAULIC: BROOKS-type hydraulic valve (incremental) PNEUMATIC: CAMFLEX-type pneumatic valve (incremental) ANALOG: Analog valve (0-20mA or 4-20mA) NONE: No valve SINGLE ELOW: Solenoid-type valve (digital without flow control

SINGLE FLOW: Solenoid-type valve (digital without flow control) TWO FLOWRATES: Two-stage valve (digital with 2-flow control)



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d) Blending type

Define the hydraulic assembly for blending:

UPSTREAM: The blending of principal and secondary products is made upstream the transfer point. Products are counted together.

DOWNSTREAM: The blending of principal and secondary products is made downstream the EMA transfer point. Products are counted separately. A choice is given for calculation and copy out of the overall volume: EMA or EMA+EMB which is a non-metrological sum. Note: the values are not guaranteed (displayed alternately with dashes) when the blending rate is greater than 5%.

e) Algorithm

Regulation for blending function can be made in different ways according to blending algorithm:

RANGE: Blending is made by range of principal product

BUNKER: The bunker mode is a variation of the range mode: the preset volume is used as the unique range volume

FOLLOWER: Blending for a regulation on the final goal.



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f) Control thresholds



Permissible maximum deviation volume

Deviation between minimum and maximum satisfaction rate

g) Operating mode

Define and activate the operating mode. No activation means no blending. The blending is ordered in different ways:

SUPERVISOR: Systematic blending is made in accordance with the blending rate set in SUPERVISOR mode

SESAME: Blending is made in accordance with the instruction of the SESAME II main computer

MIXED: Blending is made if required by the SESAME II main computer, in accordance with the blending rate set in SUPERVISOR mode.



5.4.4.2 Function → denaturant

In case of metrological denaturation, the volume unit automatically set is the litre, with a precision of one thousandth of a litre.



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a) Mode denaturant

Metrological denaturation may be optional or systematic: OPTION: requested by SESAME II network or through the quality control SYSTEM: with any EMA measurements.





d) Anti-pollution valve

This menu is used to configure the control of the anti-pollution valve. CLOSING ORDER: TOR output used to send a closing order to the valve CONTROL: control of the anti-pollution valve

OPENING CTRL: feedback control of the open position sensor CLOSING CTRL: feedback control of the close position sensor TIMER: 10 seconds-timer to decide on a possible position deviation (default value)

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5.5 Menu DATE AND TIME

Enter the day, the month and the year and then enter the time.

DATE AND TIME DATE (HH:MM) e.g. 14.41 means 2.41 pm

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ANNEXE

Each code sets specific operation according to the following tables:

<u>Cod 01</u>

Option	Meaning
X 0000	TOR input for gas detection on EMA:
	1: EMA standard Gas TOR input
	2: (ALIM_V3 only) Gas TOR input for switch in low flow
	3: Idem 1 + 2
	Any other value: Void
0 X 000	Authorization becomes emergency shutdown:
	1: 'authorization' input is managed as an emergency shutdown
	2: Idem 1, reverse input polarity
	Any other value: Void
00 X 00	Use of sub-totalisers:
	1: Control and display of 'products' sub-totalisers in accordance with denaturation
	2: Display of totalisers per injector
	3: Idem 1 + 2
	Any other value: No display
000 XX	Configuration for quality control in autonomous mode:
	99 : Activation of the quality control mode (list in supervisor mode): before beginning measurement, the MICROCOMPT+ displays a list to choose the quality in autonomous mode
	88 : Activation of the quality control mode (list in supervisor mode): quality is automatically determined in accordance with the authorization TOR inputs. WARNING: ALIM_V3 only Any other value : Detail above
000 X 0	Code for additive injector in autonomous mode:
	0: No additive injection in autonomous mode
	8, 9: See above
	n: The injector #n is used for additivation in autonomous mode
0000 X	Code for dye injector in autonomous mode:
	As above for dye injection

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<u>Cod 02</u> – **TOP**.

The Cod02 allows activation of the dead-man switch control

Option	Meaning
XXX 00	The dead-man switch is activated if Cod02 = XXXoo is different from '000'
	If Cod03 = oXooo with 'dead-man' function in volume:
	• Volume x 100 for dead-man switch control.
	If Cod03 = oXooo with 'dead-man' function in duration:
	Time in seconds for dead-man switch control.
	Note: The dead-man switch control may be disabled in some cases – See below
000 XX	If Cod03 = oXooo with 'dead-man' function in volume:
	• Volume x 10 in low flow for dead-man switch.
	If Cod03 = oXooo with 'dead-man' function in duration:
	• Time in seconds x 10 in low flow for dead-man switch.



- ⇒ The option 'configuration in duration' changes the functionality (see Cod03 = oXooo below)
- ⇒ The option 'dead-man switch' bypass doesn't disable the functionality (see Cod03 = oXooo below)
- It is therefore possible to instrument a dead-man switch that is not active for automation (disabled with Cod03) but which is used for the 'dead-man control' functionality
- If 'dead-man switch' is forced by the network SESAME II, the functionality is disable (see Cod03 = ooooX below)
- ⇒ The 'self-service' mode can be considered for this functionality (see Cod03 = Xoooo below)

If the functionality is enable:

- 1. The MICROCOMPT+ checks the transition of status of the 'dead-man switch' before:
 - Volume is XXX00 litres (Cod02 = **XXX**oo)
 - Or duration is XXX seconds (Cod02 = XXXoo and Cod03 = oXooo is at least 4)

Otherwise, the MICROCOMPT+ forces a low flow, uses factory option ALERTE_HOMME_MORT_ON if described, and proceeds to stage 2

- 2. Following stage 1, the MICROCOMPT+ checks the transition of status of the 'deadman switch' before:
 - Volume is XX00 litres (Cod02 = ooo**XX**)
 - Or duration is XX seconds (Cod02 = 000 XX and Cod03 = 0X000 is at least 4)

Otherwise the default 46 = DEAD MAN SWITCH appears.

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<u>Cod 03</u> – тор.

Option	Meaning				
X 0000	Top single side:				
	1: The MICROCOMPT+ has only a left side				
	2: The MICRO	COMPT+ has	s only a right s	side	
	4: The dead-r	nan switch fun	ctionality (see	Cod02) is enab	le only with 'free-service' mode
	5 : Idem 4 + 1		2 (,	
	6 : Idem 4 + 2				
	Any other va	lue: Top bi-sic	le. Dead-man	switch control ad	ccording to Cod02 without any
	change				
0 X 000	Top loading	MICROCOMP	T+ only:		
		Burnana	- Bymana	Function	1
		SECURIM	Dead-man	'dead-man'	
		SECONIM	switch	ueau-man	
	0	-	-	Volume	
	1	ON	-	Volume	
	2	-	ON	Volume	1
	3	ON	ON	Volume	1
	4	-	-	Duration	1
	5	ON	-	Duration	
	6	-	ON	Duration]
	7	ON	ON	Duration	
	Any other va	lue: Idem mod	dulo 8		
00 X 00	Top loading	MICROCOMP	T+ only:		
	1: Ground (let	ft or right) forc	ing via network	K SESAME II. Ph	nysical ground is uploaded in the
	network SES/	AME II			
	2: Idem 1 with	n the requirem	ent to remove	forcing between	each measurement
	5: Idem 1 but	the logical gro	ound' is upload	led in the netwo	rk SESAME II (final combination
	between phys	sical ground ar	nd forcing)		
	Any other va	iue: No groun	d forcing	h a ainala aida a	configuration (and above)
000¥0	Top loading			n a single-side c	configuration (see above)
000 A 0	1: Forcing of	the arm directi	on (left. right o	r locking) via ne	twork SESAME II
	2: Idem 1 with	n the requirem	ent to remove	forcina between	each measurement
	Any other va	lue: No forcine	a of the arm di	rection	
	Note: Forcina	is not taken ir	nto account wit	h a sinale-side d	configuration (see above)
0000 X	Top loading	MICROCOMP	T+ only:	in a chigie chae e	
	1: Forcing of	the arm down-	position or dea	ad-man switch v	ia network SESAME II
	2: Idem 1 with	n the requirem	ent to remove	forcing between	each measurement
	3: Idem 1 with a prohibition on forcing arm down-position and dead-man switch				
	simultaneously				
	4 : Idem 1 + 2 + 3				
	Any other va	lue: No forcing	g		
	Note: Forcing forced to TRL	of dead-man JE elsewhere (switch via netv (see above)	vork SESAME II	l is void if dead-man switch is
	Note 2: Forcir	ng of dead-ma	n switch disab	les control of de	ad-man switch (see above)

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<u>Cod 04</u>

Option	Meaning
X 0000	Bitmask on the 3 authorization inputs for quality selection, in autonomous mode:
	1 à 7: Bitmask to apply on inputs #1, #2, #3 with respectively bits 0, 1 and 2 of the mask
	Example: Mask = 1 means that input #1 is used, Mask = 3 means that inputs #1 and #2 are used
	Any other value: Same as Mask = 7 (the 3 inputs are used)
0 X 000	 Activates the display of the additive name and displays « BLEND » on the prompter if the blender is requested during a measurement. Displays the dye name if there's enough place on the prompter. Activate the display of rate details on the prompter during a measurement Any other value: Void
00 X 00	1: The presence of the PCC is not required. If the PCC is present but not working, starting a measurement is impossible
	Any other value : PCC is metrological. Its presence is necessary ; it must communicates to the MICROCOMPT+ it is operational to enable a measurement
000 X 0	 ≠0: Activates the EMB information update on the network SESAME II if EMB is set for metrological denaturation 0: No EMB information on the network SESAME II if metrological configuration
0000 X	1: Prohibits MODBUS writings on COM1
	2: Prohibits MODBUS writings on COM2
	3: Prohibits MODBUS writings on COM1 and COM2
	Any other value: Void

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<u>Cod 05</u>

Option	Meaning
X 0000	If X is non-zero, the MICROCOMPT+ is allowed to top up the level
0 X 000	If X is non-zero, the MICROCOMPT+ is allowed to blend without waiting for EMA to switch in high flow
00 X 00	 The MICROCOMPT+ makes a blending according to the inverse algorithm (downstream assembly with a required rate greater than the ratio of the flow rates EMA/EMB). If X is non-zero, the MICROCOMPT+ changes its functionalities as follows: The rinsing may not be equal to the rinsing volume, if this volume is greater than the volume EMA to be loaded No pollution control of the line due to the lack of rinsing after activation of a 'high rate' blending
000 XX	Gives the number of seconds of the 'dead man' function with the pushbutton used for top up (checks the pushbutton is released cyclically) If XX=0, the 'dead man' control for top up function is disabled For BOTTOM applications , XX=0 allows to top up the level by pressing BP1

<u>Cod 06</u>

Option	Meaning
0000 X	1: The request for the injector 1 pump remains active during a stop
000 X 0	1: Specify a 'wide' preset end coefficient:
	 The time before the control of the valve closure is extended (100 seconds instead of 10)
	 The duration of the control of the valve closure is reduced (5 seconds instead of 15)
	 The maximum value of the preset end coefficient is multiplied by 16
	Disable the default 'VALVE'
00 X 00	1: Reverse the polarity of the LSL inputs
0 X 000	1: Disable display

<u>Cod 07</u>

Option	Meaning	Note
00 XYZ	000: No 'addit tou' injector (injection of all doses from the first range)	Temporary code pending establishment of a
	Otherwise: XYZ allows to activate the i-eme injector (i = 1 to 8) by adding the value $2^{(i-1)}$ to this figure	configuration menu
	Example: XYZ = 1 only the injector #1 is 'addit tou' XYZ = 1 + 2 = 3 for the injectors #1 et #2, XYZ = 1 + 2 + 4 = 5 for the injectors #1, #2 et #3, etc.	
0 X 000	1: Remove the VARC control in case of any injector leakage	

Cod 08 to Cod 10

Not used

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RELATED DOCUMENTS

GU 7036_1	Operating guide MICROCOMPT+ FOR BOTTOM LOADING
GU 7036_2	Operating guide MICROCOMPT+ FOR TOP LOADING
GU 7036_3	Operating guide MICROCOMPT+ FOR BOTTOM LOADING BLENDER/DENATURANT
GU 7036_4	Operating guide MICROCOMPT+ FOR TOP LOADING BLENDER/DENATURANT
FM 8000	Replacement of the backup batteries on the AFSEC electronic board
FM 8001	Diagnostic support for power supply failure
FM 8002	Diagnostic support for a display failure
FM 8003	Diagnostic support for DEB_0 or ZERO FLOW DEFAULT alarm
FM 8004	Diagnostic support for GAS or PRESENCE GAS alarm
FM 8005	Diagnostic support for METERING PROBLEM
FM 8011	Configuration of jumpers and adjustment of metering thresholds on the AFSEC+ electronic board
FM 8500	Adjustment of an BOTTOM MICROCOMPT+
FM 8510	Adjustment of a temperature chain on MICROCOMPT+

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