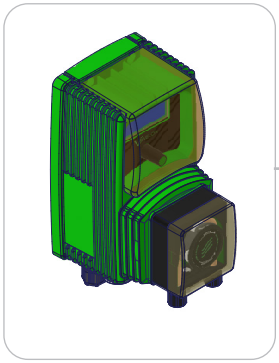
This manual contains important safety information regarding the installation and operation of the equipment.
Strictly follow these instructions to avoid injury to persons and damage to property.

The use of this equipment with radioactive chemical materials is strictly prohibited.



OPERATION MANUAL FOR “VELON” SERIES METERING PUMPS

Keep the pump protected from direct sunlight and rain.
Avoid water splashes.

ENGLI SH Version

R030226

Read Carefully!

General Safety Information

Danger!

In the event of any emergency in the environment where the pump is installed, immediately disconnect the power supply and unplug the pump from the mains.

When using particularly aggressive chemical substances, strictly comply with all applicable regulations regarding their use and storage.

Always comply with local safety regulations.

The manufacturer of the metering pump cannot be held liable for damage to persons or property resulting from improper installation or incorrect use of the metering pump.

Warning!

Install the metering pump so that it is easily accessible whenever maintenance is required.
Never obstruct the area where the metering pump is installed.

The equipment must be connected to an external control system.
In the event of water shortage, dosing must be stopped.

Servicing and maintenance of the metering pump and all its accessories must always be carried out by qualified personnel.

Before performing any maintenance operation, always depressurize the metering pump connection tubing.

Always carefully empty and flush tubing that has been used with particularly aggressive chemical substances.
Wear appropriate personal protective equipment during maintenance operations.

Always carefully read the chemical characteristics of the product to be dosed.

Model Overview

VELON MF is the most advanced model in the range, designed for complex applications requiring maximum versatility.
Thanks to its multifunction stepper motor and the availability of numerous operating modes, it easily adapts to scenarios where dynamic and highly configurable dosing is required.

VELON CL is the essential model in the range, designed to ensure constant and safe dosing with maximum ease of use.
It is the ideal solution for systems and applications where advanced communication functions are not required, and where continuous, linear, and trouble-free operation is preferred.
Its compact and robust construction makes it suitable for a wide range of standard applications, ensuring reliability in everyday operating conditions.

VELON PM is the model designed for integration into complex and centralized systems.
Thanks to its architecture, it not only ensures precise and reliable dosing, but also becomes an active component of industrial automation systems, communicating with PLCs and supervisory platforms.

VELON PO is a “smart” metering pump developed for applications where precision must go hand in hand with adaptability to process parameters.
Thanks to advanced peristaltic technology and a stepper motor, it ensures stable, safe, and dynamic proportional dosing, even under variable operating conditions.

DOSING CAPACITY			
Pressure	**RPM**	**Flow Capacity** (Hose **Ø1,6x1,6)**	**Flow Capacity** (Hose **Ø4,8x1,6)**
bar (psi)	rpm	l/h (gal/h)	l/h (gal/h)
2 (29)	1 to 100	0,018 to1,8 l/h | 0,0047 to 0,47 gal/h	0,12 to12 l/h | 0,0317 to 3,17 gal/h

Designs and technical specifications may be modified without prior notice for the purpose of improving product performance.

2. Package Contents

The package contains the pump and all accessories required for proper installation and commissioning, as listed in the table below.

MOD.	INJECTION	LEVEL PROBE WITH FOOT FILTER	FUSE	INPUT CABLE	STANDBY CABLE	MODBUS CABLE	ALARM CABLE	WALL PLUGS	HOSES	HOSE KIT	HOSE KIT FOR PER	USER MANUAL
CL	☑	☑	☑	X	X	X	☑	☑	☑	☑	☑	☑
MF	☑	☑	☑	☑	X	☑	☑	☑	☑	☑	☑	☑
PM	☑	☑	☑	X	X	☑	X	☑	☑	☑	☑	☑
PO	☑	☑	☑	X	☑	☑	☑	☑	☑	☑	☑	☑

The packaging used for transport (box, protective materials, molded inserts, etc.) is designed to ensure product integrity during shipment.

It is recommended not to dispose of the original packaging after opening the package.
These materials may be essential in the event of:

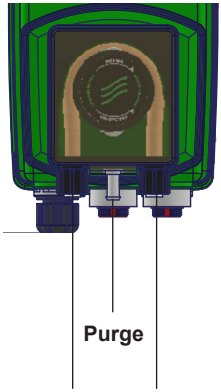
- shipment of the unit for service or repair;
- possible return of the product;
- subsequent relocation of the equipment.

Use of the original packaging reduces the risk of damage during transport and ensures compliance with the safety conditions specified by the manufacturer.
If the original packaging is no longer available, it is the user's responsibility to adopt equivalent packaging solutions suitable for adequately protecting the product.

The packaging materials are recyclable and must be disposed of in accordance with applicable local waste management regulations.

NEVER DISPOSE OF THE PACKAGING.
IT CAN BE REUSED TO TRANSPORT THE PUMP.

Disconnect the pump from the power supply before making connections to the probes, the selected outputs, and the hydraulic connections. The hydraulic connections for all models are as follows:



Correct tubing connection is essential to ensure safe and reliable operation of the peristaltic pump.
Before proceeding, make sure that the unit is switched off and disconnected from the power supply.
Use only tubing of the type, diameter, and material compatible with the pump model and the fluid to be dosed, in accordance with the technical specifications provided by the manufacturer.
Use of unsuitable tubing may impair performance, reduce tubing service life, and cause malfunctions or leaks.

Insert the tubing into the peristaltic pump head following the specified routing, ensuring that it is correctly seated in the roller track and that it is free from bends, twists, or compression.
Ensure that the tubing is evenly positioned and that the ends are correctly aligned with the suction and discharge fittings.
Once the tubing is in place, secure it to the suction and discharge connections using the appropriate fittings and check that all connections are properly tightened.
Improperly tightened connections may result in air ingress, fluid leakage, or irregular dosing.

After installation, perform a brief visual and functional check by running the pump at low speed to verify that the tubing moves smoothly and that there are no vibrations, abnormal noise, or fluid leakage.
It is recommended to periodically inspect the condition of the tubing and replace it in the event of wear, hardening, or deformation, in order to maintain system efficiency and reliability over time.

For peristaltic tubing maintenance and/or replacement procedures, refer to the “Peristaltic Maintenance” chapter of this manual.

Warning: the bleed tube must be inserted into the container of the product to be dosed.
If left free, it may cause damage to persons or property.

4. Preparation for Installation

Installation and commissioning of the pump are divided into four main steps:

- Pump installation
- Installation of hydraulic components (tubing, level probe, injection valve)
- Electrical installation (connection to the power supply, priming)
- Setup

Before starting installation, ensure that all necessary precautions for installer safety have been taken.

Protective Clothing

Always wear protective masks, gloves, safety glasses, and, if required, additional personal protective equipment (PPE) during all installation phases and when handling chemical products.

Installation Location

- Ensure that the pump is installed in a safe location and securely fastened so that vibrations generated during operation do not allow any movement.
- Ensure that the pump is installed in a location that is easily accessible.
- The metering pump must be installed with the base in a horizontal position.
- Avoid water splashes and direct sunlight.

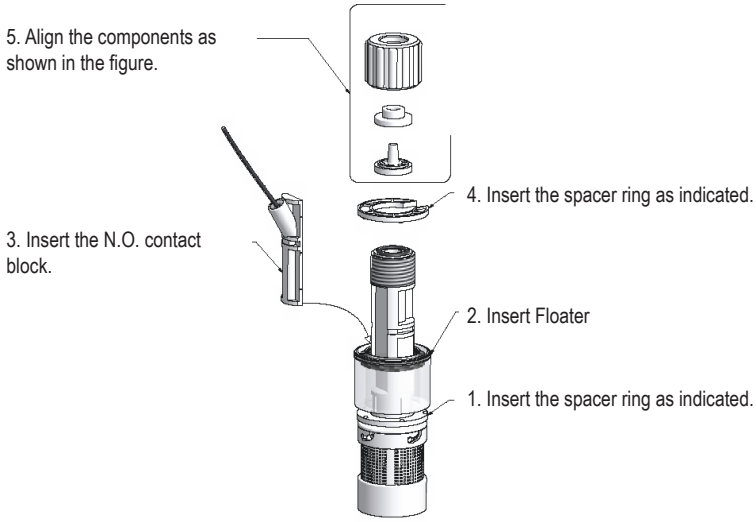
Tubing and Valves

- Suction and discharge valves must always be installed in a vertical position.
- All tubing connections to the pump must be made using hand-tightening only.
- Use only tubing compatible with the chemical product to be dosed.
- Refer to the chemical compatibility table.
- If the product is not listed in the table, consult the supplier.

5. Installation of Hydraulic Components

Assembly of the foot filter with level probe

The level probe must be assembled using the supplied kit with foot valve.
The foot valve is designed to be installed on the bottom of the product container, ensuring proper suction without drawing in sediment.



Connect the BNC connector of the level probe to the level input located on the pump connection side. Insert the level probe, with the assembled foot filter, into the bottom of the container of the product to be dosed.

Note: If an agitator is present in the container, a suction lance must be installed.

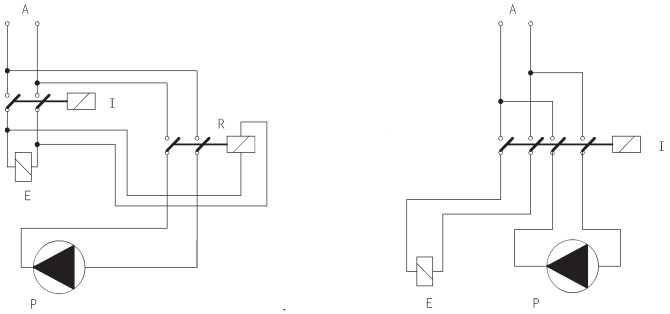
6. Electrical Installation

Electrical connection of the pump must be carried out by qualified personnel only.

Before connecting the pump, check the following points:

- Verify that the nameplate ratings of the pump are compatible with the mains power supply. The pump nameplate is located on the side of the unit.
- The pump must be connected to an electrical system equipped with an efficient grounding system and a residual current device (RCD) with a sensitivity of 0.03 A.
- To prevent damage to the pump, never connect it in parallel with inductive loads (e.g. motors); use a relay instead.

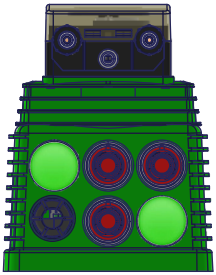
See the figure below.



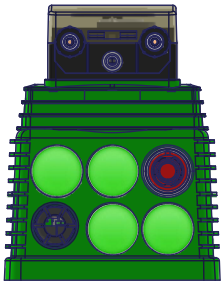
R – Relay
I – Switch or safety device
E – Solenoid valve or inductive load
A – Power supply

Warning: For pumps powered at 115 or 230 VAC, do not use motor protection devices (“motor protection switches”).

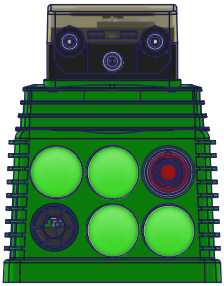
Pump connections by model.
Make the connections to the metering pump according to the drawings for your specific product.



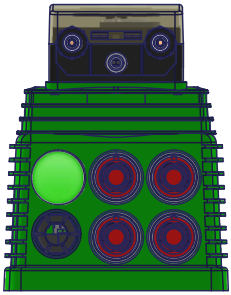
VELON MF	
INTERFACE	POSITION
ALARM (OPTIONAL)	Top left
POWER SUPPLY INPUT	Bottom left
MULTI FUNCTION INPUT	Bottom center
MODBUS RS485	Top center
LEVEL INPUT	Top right



VELON CL	
INTERFACE	POSITION
ALARM (OPTIONAL)	Top left
POWER SUPPLY INPUT	Bottom left
LEVEL INPUT	Top right



VELON PM	
INTERFACE	POSITION
POWER SUPPLY INPUT	in basso a sinistra
MODBUS RS485	in alto al centro
LEVEL INPUT	in alto a destra



VELON PO	
INTERFACE	POSITION
ALARM (OPTIONAL)	Top left
POWER SUPPLY INPUT	Bottom left
STANDBY INPUT	Bottom center
MODBUS RS485	Top center
LEVEL INPUT	Top right
SERIAL PROBE INPUT	Bottom right

CONNETTORI

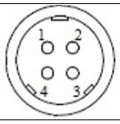
N.	M12x1	Decription	Wire Color	Function
1		RS485 MODBUS	1 Yellow	+ RS485
			2 Green	- RS485
			3 Blue	GND

N.		Decription	Wire Color	Function
2		STAND-BY	4 White	+ STAND-BY
			3 Brown	- GND
		INPUT [1]	2 Blue	+ INPUT (MAX 120Hz FREQ.)
			3 Brown	- GND
			1 [Yellow] - Hall effect water meter	+ 12 V
		EXT CONSTANT	5 Green	+ EXT CONST
			3 Brown	- GND

1 This INPUT can be used as:
pulse input from a dosing lance (reed signal)
pulse input from a dosing lance with Hall effect sensor
start contact for "BATCH" mode
voltage input for "VOLT" mode
"PULSE" contact

If not in use, it is recommended to protect the connectors with the appropriate cap.

N.		Decription	Wire Color	Function
3		LEVEL	sonda di livello (1 giallo, 2 blu)	/

N.		Decription	Wire Color	Function
4		ALARM contatto libero	3 Bianco	N.O.
			1 Giallo	N.C.
			2 Verde	COMMON

Navigation
The backlit LCD display and the front encoder allow simple and intuitive user interaction, even when numerous options are available. The menus guide the user step by step, simplifying programming and reducing configuration time.

Dosing
The pump features 10 operating modes, allowing it to cover both standard applications and more advanced processes requiring flexibility and adaptability.

Additional Functions
The pump integrates tank management to ensure operational continuity and prevent unexpected shutdowns.
A multifunction operating mode is available for selecting the specific required task.
The optional alarm provides an additional level of safety.
Advanced electronics ensure consistent accuracy even under varying load conditions.

IoT and Services
The pump stands out for its connectivity features: it supports Wi-Fi, OTA firmware updates, and can be managed through dedicated digital platforms.
This enables remote monitoring and control, making it suitable for applications requiring continuous supervision.

Startup

All operations described above must be completed before starting the pump:

- Pump positioning
- Hydraulic connection
- Electrical connections (power supply, standby/input, level, alarm output)
- Programming

⚠ The pump may require a few seconds before starting.
This depends on the motor start-up time.

⚠ Verify that the pressure does not exceed the nameplate pressure.
If this occurs, immediately stop the motor.

If the pump does not dose, perform the following operations:

a) Stop the motor.
b) Prime the pump.
c) Restart the motor.

Monitor the pump while it is operating.

Test

Use this function to accurately determine the pump flow rate with the liquid being used. (MF model only)

1. Install the pump on the system, making sure that the suction tubing (complete with foot filter) is inserted into a graduated cylinder in milliliters (ml) (1 ml = 1 cc).

2. Fill the graduated cylinder with the product to be dosed and prime the pump, ensuring that the pump head is completely filled with the product.
Check the initial quantity of product in the graduated cylinder, including the foot filter.

3. Power the pump.

4. From the Setup / More menu, select "TEST" and set the test duration time.

5. Press the "START" icon. The pump will begin dosing the liquid against the system pressure.

6. At the end of the test, read the remaining quantity of chemical product on the graduated scale.
The dosed quantity corresponds to the initial quantity minus the remaining quantity.

The hourly pump flow rate is calculated by multiplying the dosed quantity per minute by 60 minutes.

Example:
Dosed quantity: 100 ml
Test duration time: 60 seconds

Hourly pump flow rate: 100 × 60 = 6,000 ml/h = 6 l/h

Note: To optimize the procedure, it is also possible to set the quantity of product to be dosed during the test phase.

Warnings

Prime the pump:

- at first use;
- whenever the pump has been stopped for a long period;
- if air is present in the pump body or in the suction tubing.

⚠ The equipment must be connected to an external control system.
In the event of water shortage, dosing must be stopped.

⚠ Adopt suitable measures to prevent different chemical products from coming into contact with each other.

⚠ Stop dosing during backwash cycles and in the absence of flow, as these conditions may cause chemical overdosing and/or the generation of hazardous gases in tanks or piping.

⚠ Do not operate the pump with suction and discharge blocked.
Adopt all necessary measures to prevent this condition.

OPERATOR PROTECTION

Always wear safety equipment in accordance with company regulations.

In the work area, during installation, maintenance, and when handling chemical products, use:

- protective mask
- protective gloves
- safety glasses
- earplugs or earmuffs
- additional PPE, if required

Priming

At first use and whenever the pump has been stopped for a long period, priming must be performed.
To prime the pump without coming into contact with the chemical product:

- connect all tubing (discharge tubing, suction tubing, and drain tubing);
- open the bleed valve by fully turning the bleed knob;
- select PRIMING on the display, set the time, and start the procedure.

When the product begins to circulate through the drain tubing, close the bleed knob.
At the end of the procedure, the pump will return to the normal operating mode, if set.
With viscous liquids, to facilitate priming, insert a 20 cc syringe into the bleed tubing and draw the liquid.
When the syringe is almost full, close the valve by turning the bleed knob.

11. VELON MF / INTERFACE

Main Functions

The encoder allows you to:

Select a menu	Rotate the encoder to scroll through the menu items.
Enter a menu	Press the encoder on the selected menu item.
Save changes and return to the main screen	Press the encoder on the icon ⌂
Save and return to the previous menu	Press the encoder on the icon ↰
Enter a (numeric) value	Press the encoder on the value, rotate clockwise to increase and counterclockwise to decrease. Press to confirm the selection.

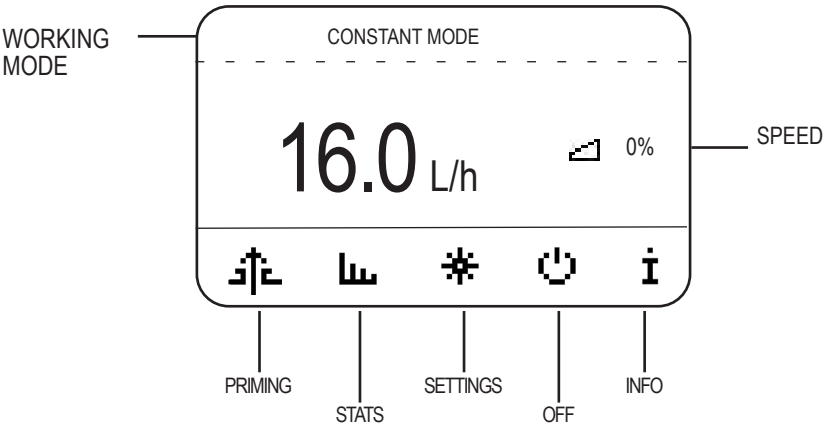
On all screens, after 60 seconds of inactivity, the display automatically returns to the main screen without saving.

At first power-up, set the language.
The language can be changed later in the Advanced / More menu.

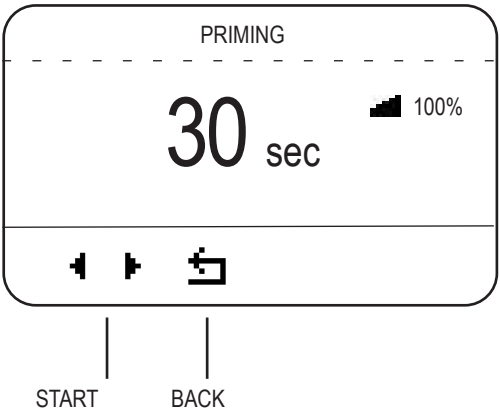
Icone sul display

	PRIMING	■	STOP
	STATISTICS		RESET
	SETTINGS	⌂	SAVE and GO TO MAIN SCREEN
	OFF		ALARM / STANDBY
↰	SAVE and GO BACK TO PREVIOUS SCREEN		FLOW SPEED
	START		
i	INFO		

HOME



PRIMING

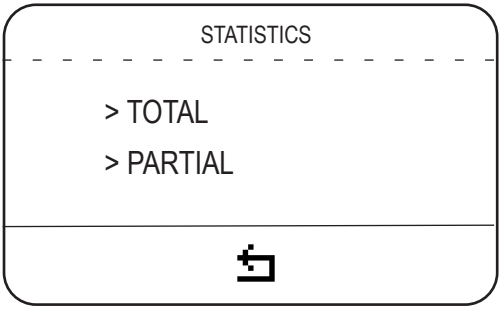


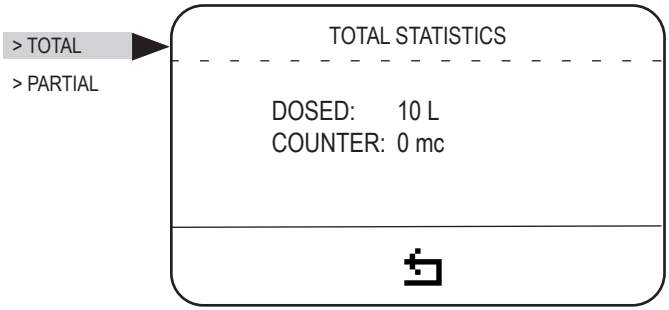
START: starts the priming ▸ or unloading ◂ function.

■ STOP: stops the priming process and resets the counter. The default counter value is 30 seconds.

The pump may take up to 10 seconds before starting the PRIMING function.

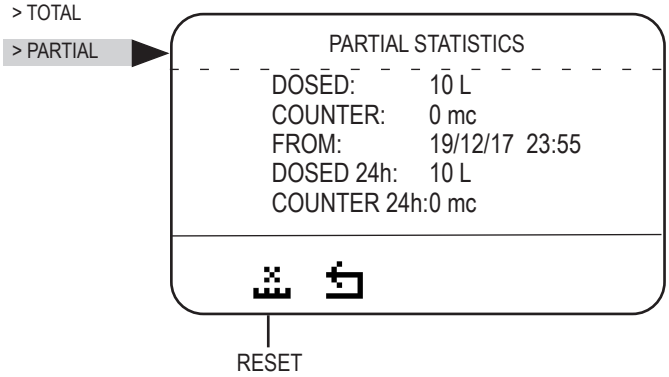
STATISTICS





DOSED: TOTAL DOSED QUANTITY (MAX 999,999,999 L).
COUNTER: COUNTER (CUBIC METERS OF WATER).

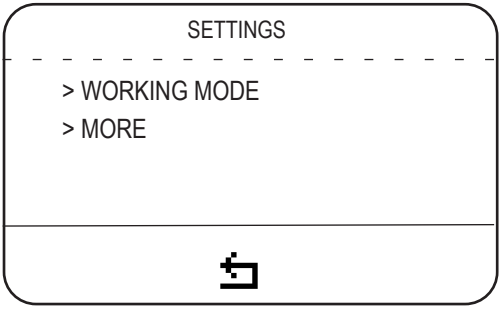
To reset all counters, access the LOAD DEFAULT function in the menu:
Settings / Advanced / More / Load Default



DOSED: total dosed quantity (max 999,999,999 L).
COUNTER: counter (cubic meters of water).
FROM: date and time of the last statistics reset.
DOSED 24h: quantity dosed during the previous day (00:00 to 23:59 of the previous day).
COUNTER 24h: water counter for the previous day (00:00 to 23:59 of the previous day).
To reset all counters, press the RESET icon.

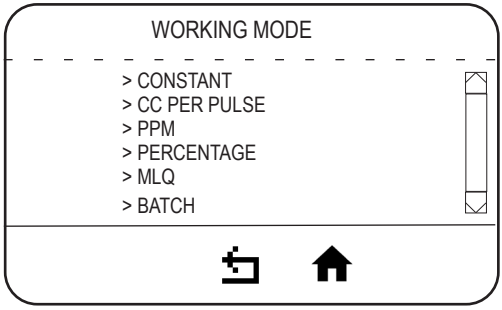
SETTINGS

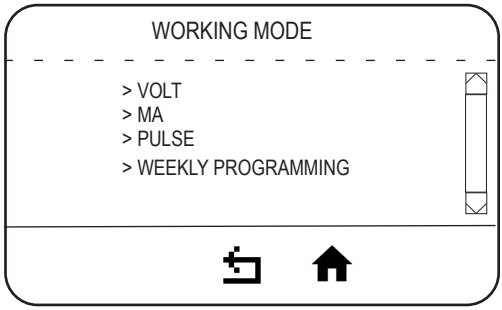
In the Settings menu, after 60 seconds of inactivity, the display automatically returns to the HOME screen without saving.



> WORKING MODE

> MORE





Note: Only the MLQ, PERCENTAGE, and PPM modes affect the pulse counter statistics.

WORKING MODE	PARAMETERS TO SET*		NOTES	WHEN
CONSTANT	l/h: liters / hour. turn the knob to the required liters per hour VALUE. the pump will increase / DECREASE the speed according to its maximum capacity.		The pump doses at a constant frequency corresponding to a specific number of engine's rotations that can be visualized by the icon .	To dose regularly a standard quantity of chemical (no external signal).
CC PER PULSE*	CC MIN 0,0001 M/L MAX M/L 1X 1 PULSE = M/L SET WMETER P/L OR L/P AND PULSES SET		Dosing rate is determined by pulses from a water meter..	When using an external signal from a pulse sender water meter.
PPM	PPM:1.00 (max 9999.99) CONCENTRATION:10.0% WMETER P/L OR L/P AND PULSES SET		Dosing rate is determined by pulses from a water meter, PPM, chemical product (%) concentration.	When using an external signal from a pulse sender water meter and it's necessary to specify only PPM (parts per million) and product concentration, leaving the pump to manage coming pulses.
PERCENTAGE	PERCENTAGE:1.00 (max 100.00) CONCENTRATION:10.0% WMETER P/L OR L/P AND PULSES SET		Dosing rate is determined by pulses from a water meter, percentage (%), chemical product concentration.	When using an external signal from a pulse sender water meter and it's necessary to specify only %, leaving the pump to manage the coming pulses.
MLQ	MLQ:1.00 (max 1000.00) CONCENTRATION:10.0% WMETER P/L OR L/P AND PULSES SET		Dosing rate is determined by pulses from a water meter on the base of set MLQ (milliliters per quintal), chemical product concentration (%).	When using an external signal from a pulse sender water meter and it's necessary to dose the product quantity set specifing the MLQ (milliliters per quintal) and leaving the pump to manage the coming pulses.
BATCH	EXTERNAL MANUAL	EXTERNAL Quantity: 10.000 L Contact: N.C. (or N.O.) ☐ RESET AFTER ALARM	External mode: signal from an external contact starts the pump to dose the amount product at max frequency.	This mode allows to start dosing after pump receives an external signal. Reset after alarm to reset counting.
		MANUAL 10.000 L (Start icon for manual dosing)	Manual mode: to dose a quantity at max frequency (manual start).	This mode allows to start dosing manually.
VOLT	HIGH:10.0 V 60.00 L/H LOW: 0.0 V 0.00 L/H		In Voltage mode, the pump doses proportionally between the low and high voltage values. In VOLT working mode, voltage input value is shown on main menu (top/ right).	This mode is used with controllers provided of a proportional output in voltage.

***Only one operating mode can be set at a time.*

PULSE	HIGH:180 p/m 60.00 L/H LOW: 0 p/m 0.00 L/H		The pump doses proportionally between the low and high p/m values. In Pulse working mode, pulses number is shown on main menu (top/right).	This mode is used with controllers provided of an impulsive output
WEEKLY PROGRAMMING	☑ PROGRAM 1 ☐ … ☐ PROGRAM 24	Start: hh:mm Duration: 00h 00m Quantity: 2,5 l 15% ☑ Sunday ☐ Monday ☐ … ☑ Saturday	Set programs (up to 24). For each program set start time, duration, quantity to dose and days. Pump will dose the quantity starting at the time set. The duration cannot be over the day. Minimum quantity is calculated basing on pump capacity. Do not overlap programs.	The mode is used to schedule the pump's weekly dosing. The operating frequency cannot be lower than 1%. Note: time adjustment is in 10-minute steps.

Note: in all operating modes, the pump has a dosing value resolution of 1%.

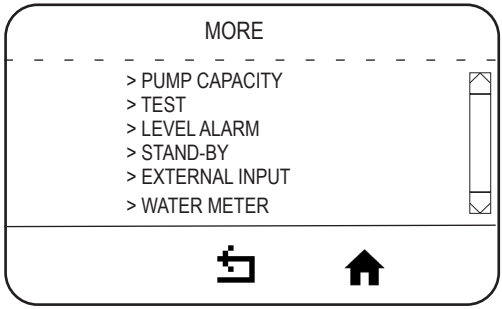
"UPKEEP" Mode.

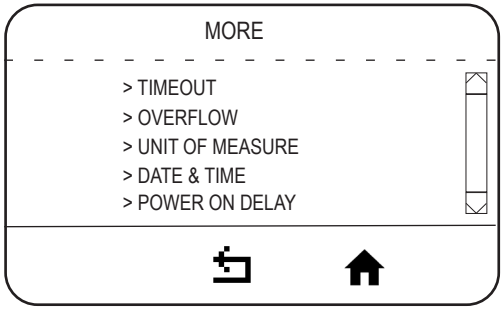
The "ppm", "perc", and "mlq" operating modes include an additional configurable function called "upkeep", which can be enabled or disabled. This function allows a "timeout" to be set, a countdown between 0 and 24 hours.

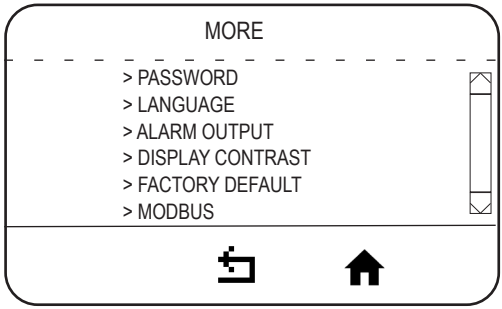
Once the timeout has elapsed, if the pump has not yet received a pulse from the pulse counter, it performs a series of maintenance dosing cycles until the ml/h value set in the "upkeep dosage" field is reached.

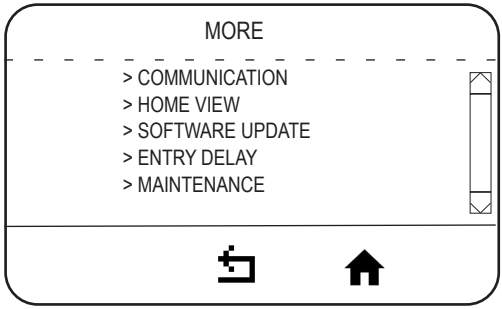
> WORKING MODE

> MORE









	PARAMETERS TO SET		NOTES
PUMP CAPACITY	FLOW: 999.9 L/h CC/MIN: 16665.00 HOSE: IF SET TO 12L/H THEN SIZE IS 4,8X1,6 IF SET TO 1.8L/H THEN SIZE IS 1,6X1,6		By default, the pump flow rate is the one indicated on the nameplate.
TEST	FROM 1 MIN TO 60 MINUTES (DEF 6 MINUTES)		Perform the test to verify the pump flow rate at maximum frequency (see page 12).
LEVEL ALARM	STOP AFTER: 10.0 L ☐ CONTACT: N.O. ↘		Level pre-alarm (low product level). To clear the alarm, refill the container. If set to "0 L", the pump stops when the alarm occurs. The contact can be set as N.O. or N.C.
STAND-BY (EXT CONSTANT)	DISABLED STAND-BY ↘	CONTACT: N.O.	The external signal connected to the stand-by input can be: enabled (Stand-by) and set as N.O. or N.C. This is for starting the pump in constant mode upon opening or closing of an external contact.
EXTERNAL INPUT	DISABLED EXTERNAL INPUT ↘	CONTACT: N.O. QUANTITY: 12.00 l/h 15%	The external signal starts constant dosing of a defined hourly quantity (QUANTITY). In this case, the displayed operating mode is EXT CONSTANT. The mode remains active until the contact state changes. In both cases, the contact can be set as N.O. or N.C.
WATER METER	L/pulse: 1.0 [gal/pulse: 1.0]		This menu allows setting the characteristics of the counter. It is possible to select the quantity in pulses per liter or liters per pulse generated by the counter. This value determines dosing in PPM / MLQ / percentage modes.
	pulse/L: 1.0 [pulse/gal: 1.0]		
TIMEOUT	0 - 120 SEC		Maximum time between one pulse and the next: within this interval, the pump will distribute the product evenly. The default value is 10 seconds; 0 disables the function.
OVERFLOW	ALARM WORK		The Overflow function generates an alarm (displayed on the screen) that may or may not stop the pump. The function can be enabled for PPM / percentage / mlq / BATCH operating modes. In PPM / percentage / mlq, the overflow alarm occurs when the operating frequency exceeds the rated value. In BATCH, it occurs when the pump receives an external signal during the dosing phase.
	ALARM STOP		
UNIT OF MEASURE	LITER	GALLONS	Units of measure: liters / gallons
DATE & TIME	Format: dd/mm/yy 24 Date: Saturday 26/12/15 time: 16:01:19	Format: mm/dd/yy 12 Date: Saturday 12/26/15 time: 04:01:19 pm	Changing the date and time resets the partial statistics.

POWER ON DELAY	00 min (max 10 min)		Power on delay sets a start-up delay from 0 to 10 minutes.
PASSWORD	ADMINISTRATOR PASSWORD New password: 0 _ _ _	> ADMINISTRATOR > USER	The pump is supplied without a password. At first use, set the administrator password. To also set the user password, exit and re-enter the PASSWORD menu. To reset the passwords, perform the Load Default function from the menu.
LANGUAGE	IT - EN - FR - DE - PT - ES - PL - TK		System Language choice
ALARM OUTPUT	ENABLED CONTACT N.C.(or N.O.) LEVEL WARNING LEVEL ALARM STAND BY OVERFLOW WARNING OVERFLOW ALARM NO INPUT MC ERROR OFF WARNING HOSE RPM WARNING HOSE DAY		Alarm output manages the status of the alarm relay output contact (N.O. or N.C.): **level warning**: product reserve **level alarm:** product reserve ended **stand-by**: pump stopped **overflow w.**: too many pulses, if warning: continues to operate, if alarm: stop activity; **no input**: missing input signal; **mc error**: engine blocked, error code ref.; **off**: when off and pump is off then it active alarm out **warning hose:** hose status alarm / hose life exceed
DISPLAY CONTRAST			Display Contrast Adjustment
FACTORY DEFAULT	YES	NO	Reset of all values and restoration of factory settings.

MODBUS	ID: 1 BAUDRATE: 9600 FORMAT 8N1 (default)	Set ID (1 to 255) Set the communication speed: 2400 / 4800 / 9600 / 19200 / 38400 / 115200 Set the bit format

COMMUNIC.	DHCP MODE MESSAGE WIFI SCAN* ***2,4 Ghz WiFi only supported**	**DHCP** to set automatic retrieval of network parameters, or manual configuration if specified by your network administrator. **MESSAGE** to configure push notifications via the app and the alarm type, or email notifications by entering a valid email address. **WIFI SCAN** to list all available Wi-Fi networks in the area and connect to the preferred one.

HOME VIEW	OPERATING UNIT DISPLAY MODE	% mode L/h % mode % L/h mode

SOFTWARE UPDATE **ENTRY DELAY** **MAINTENANCE**	UPDATE FIRMWARE IF ENABLED, STANDBY AND LEVEL DELAY RESET HOSE WARNING	OTA / WIFI UPDATE 3SECONDS HOSE EXCHANGED

> INFO ▶ ALARMS
SOFTWARE RELEASE
RESERVE
INSTANT FLOW RATE
IOT SERVICES
MAINTENANCE

To view active alarms, access the Info / Alarms menu.

The ⚠ icon on the main menu indicates one or more active alarms or standby status.

Tab. 1. Alarms management

ALARM	PROBLEM	HOW TO FIX IT
LEVEL	Tank, end of product	Fill Tank
OVER FLOW	Pump's flow out of range	Check settings then switch off and then back on the pump

Tab. 2. Software Release

Release	Current Firmware Release

Tab. 3. Reserve

Reserve	Indicates the reserve level of the product to be dosed in the container, as set in the level alarm menu (stop after).

Tab. 4. INSTANT WM FLOW RATE

Insant WM FR	Indicates the flow capacity of the pulse counter connected to the installation.

Tab. 5. IoT SERVICES

NIMBUS	Product activation and registration on the NIMBUS portal (serial number, network MAC address, portal registration QR code)

Tab. 6. MAINTENANCE

MAINTENANCE	Peristaltic Tube Life Counters

Navigation
The interface is intentionally minimal, designed for maximum ease of use. The front potentiometer allows quick and intuitive adjustment of the flow rate, while the status LED and the ON/OFF button enable the operator to continuously monitor pump operation. This operational simplicity makes the pump suitable even for less experienced users.

Dosing
The pump operates in constant mode, ensuring a stable and precise flow thanks to a highly reliable stepper motor. This approach makes the VELON CL ideal for repetitive processes where dosing stability is the most critical requirement.

Additional Functions
Additional features include tank level management, which helps prevent unexpected shutdowns, and an optional alarm output, providing an extra level of system safety.

Operating Modes
The pump is switched off by pressing and holding the ON/OFF button for 2 seconds. The LED turns orange.
When the pump is in OFF status, pressing and holding the ON/OFF button for 4 seconds switches the pump to unloading mode, or from unloading mode back to dosing mode.

LED (COLOUR)	PUMP STATUS
RED flashing	Motor alarm or BUS communication error
RED steady on	Level alarm, refill the chemical container
GREEN Quick flashing (once every 0.5 seconds)	Pump paused (OFF) and powered in loading mode (counter-clockwise motor rotation)
GREEN Turns OFF at each motor revolution	Pump operating in dosing mode (clockwise motor rotation)
ORANGE Fast flashing (once every 0.5 seconds)	Pump paused (OFF) and powered in unloading mode (counter-clockwise motor rotation)
ORANGE Turns OFF at each motor revolution	Pump operating in unloading mode (counter-clockwise motor rotation)

Navigation
Unlike other models, the PM does not rely on an advanced local user interface.
Control is performed via the MODBUS RTU protocol, allowing the pump to be directly integrated into plant management and supervision systems.
A status LED and an ON/OFF button complete the basic local control functions.

Dosing
The pump ensures constant and regular dosing, controlled by external systems.
The stepper motor provides stability and precision, while MODBUS control allows the pump to be synchronized with complex and centralized process logic.

Additional Functions
The pump includes tank level management to ensure safety and operational continuity.
Its compact and robust design facilitates integration even in limited installation spaces.

Connectivity and Services
The distinguishing feature is MODBUS RTU communication, which enables the pump to be managed and monitored as part of a larger system. Wi-Fi is not provided, as the pump is designed for industrial environments where wired and centralized automation is preferred.

LED (COLOUR)	PUMP STATUS
RED flashing	Motor alarm or BUS communication error
RED steady on	Level alarm, refill the chemical container
GREEN Quick flashing (once every 0.5 seconds)	Pump paused (OFF) and powered in loading mode (counter-clockwise motor rotation)
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ORANGE Turns OFF at each motor revolution	Pump operating in unloading mode (counter-clockwise motor rotation)

MODBUS PROGRAMMING OF REGISTER 40001

MODBUS is a serial communication protocol created in 1979 by MODICON (a company now part of the Schneider Electric Group) to enable communication between its programmable logic controllers (PLCs). It has become a de facto standard in industrial communications and is currently one of the most widely used connection protocols worldwide among industrial electronic devices. The main reason for the widespread adoption of MODBUS compared to other communication protocols is that it is an open, royalty-free protocol. With the MODBUS protocol, the format and method of communication are defined between a "master" that manages the system and one or more "slaves" that respond to the master's queries. The VELON MF device operates as a "slave". The device address (ID), data format, and communication speed in baud can be set directly from the device's MODBUS Communication menu.

MODBUS allows the connection of one master (e.g. a PC) and several "slaves" (e.g. measurement and control systems). Two versions are available: one for serial interfaces (RS-232 and RS-485) and one for ETHERNET. The following operating modes can be distinguished for data transmission:

MODBUS TCP: ETHERNET TCP/IP communication based on the client/server model
MODBUS RTU: asynchronous serial transmission via RS-232 or RS-485
MODBUS ASCII: similar to the RTU protocol, except for a different data format

The operating mode of the VELON PM is RTU (asynchronous serial transmission via RS-485).

The pump can be controlled exclusively via MODBUS RTU (RS-485 connector) at memory location 40001. Format 8N1 (default): 8 data bits, no parity ("No parity"), and 1 stop bit. The pump will always have ID 01. Baud rate: 38400.

Address	Byte Number	Format	Property	Function	Description
40001	2	uint16	R/W	03 / 06	0-100% Motore

Request to read the status of register 40001 by the "MASTER"

ID	FUNCTION	ADDRESS (HIGH)	ADDRESS (LOW)	DATE WORD (HIGH)	DATE WORD (LOW)	CRC (HIGH)	CRC (LOW)
01	03	00	00	00	01	84	0A

Esempio di invio comando di **scrittura** del registro 40001 per funzionamento della pompa al 50% della capacità da parte del "MASTER".

ID	FUNCTION	ADDRESS (HIGH)	ADDRESS (LOW)	DATE WORD (HIGH)	DATE WORD (LOW)	CRC (HIGH)	CRC (LOW)
01	06	00	00	00	32	78	14

Il campo "DATE WORD (LOW)" definisce la percentuale di capacità della pompa espressa da 0 a 100% in esadecimale. Nell'esempio il valore "DATE WORD (LOW) 32" corrisponde al decimale 50 ovvero 50%.

CRC ERROR HANDLING

During transmission, two types of errors may occur, which are handled differently: transmission errors and operational errors. Transmission errors occur when the transmitted message is corrupted during transmission and is therefore received incorrectly. In this case, the error is detected by a possible bit parity check, if enabled in the serial transmission, or by the CRC check. The "slave" that detects this type of error considers the message invalid, discards it, and does not send any response. If, on the other hand, the message is correct in its format and free from transmission errors, an error may still occur in the content of the message itself. For example, the requested function may not be executable for any reason, or an incorrect address may be specified. In this case, an operational error occurs. For this type of error, the "slave" device responds with an exception message.

This message consists of the address, the requested function code with a delta applied, an error code, and the CRC. To indicate that the response is an error notification, the function code is returned with the most significant bit set to "1". The structure of the response is as follows:

ADDRESS SLAVE	FUNCTION	ERROR CODE	CRC (HIGH)	CRC (LOW)

Request to a "slave" with an incorrect ID

ID	FUNCTION	ADDRESS (HIGH)	ADDRESS (LOW)	DATE WORD (HIGH)	DATE WORD (LOW)	CRC (HIGH)	CRC (LOW)
04	06	00	00	00	32	78	14

The message is considered invalid and no response is returned.

Richiesta con un "CRC" sbagliato

ID	FUNCTION	ADDRESS (HIGH)	ADDRESS (LOW)	DATE WORD (HIGH)	DATE WORD (LOW)	CRC (HIGH)	CRC (LOW)
01	06	00	00	00	32	BB	BB

The message is considered invalid and no response is returned.

Request to a non-existent address

ID	FUNCTION	ADDRESS (HIGH)	ADDRESS (LOW)	DATE WORD (HIGH)	DATE WORD (LOW)	CRC (HIGH)	CRC (LOW)
01	06	02	35	00	32	78	14

Answer: "Illegal Data Address"

ID	FUNCTION	EXCEPTION CODE	CRC (HIGH)	CRC (LOW)
01	83	02	C0	F1

Write request to an existing register with a non-permitted value

ID	FUNCTION	ADDRESS (HIGH)	ADDRESS (LOW)	DATE WORD (HIGH)	DATE WORD (LOW)	CRC (HIGH)	CRC (LOW)
01	06	00	00	00	FF	78	14

Answer

ID	FUNCTION	EXCEPTION CODE	CRC (HIGH)	CRC (LOW)
01	86	03	02	61

Request for a non-existent function

ID	FUNCTION	ADDRESS (HIGH)	ADDRESS (LOW)	DATE WORD (HIGH)	DATE WORD (LOW)	CRC (HIGH)	CRC (LOW)
01	06	00	00	00	01	21	CB

Answer

ID	FUNCTION	EXCEPTION CODE	CRC (HIGH)	CRC (LOW)
01	80	01	80	00

ERROR CODES

CODE	NAME	DESCRIPTION
01	ILLEGAL FUNCTION VALUE	Non-existent Function
02	ILLEGAL DATA ADDRESS	The address referenced by the data field is not a permitted address on the addressed "slave". Attempted write operation to a read-only register.
03	ILLEGAL DATA VALUE	The value to be assigned to the data field is not permitted for this address.
05	BUSY WRITING	n/a

Address	Register Number	Format	Property	Function	Description
40001	2	Int16	r/w	3/6	RPM value
40003	2	Int16	r/w	3/6	RUN
40004	2	Int16	r/w	3/6	OFF
40005	2	Int16	r/w	3/6	Loading*
40006	2	Int16	r/w	3/6	Unloading**

Only one of the two registers must be set to 1.

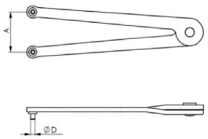
Example:

40003 = 1
40004 = 0
Pump in RUN.

To set the pump to OFF, set register 40004 to 1. Register 40003 will automatically switch to 0.
To set the pump to RUN, set register 40003 to 1. Register 40004 will automatically switch to 0.

* Motor rotation clockwise (normal operation, priming)
** Motor rotation counterclockwise (depriming operation)

Procedure for Replacing the Peristaltic Pump Tube + Slide Semi-Assembly (WN)



Required / Useful Tools

New tube + slide semi-assembly (Required)

Adjustable pin wrench with ØD = 4 mm and A = 19.7 mm (Useful)

Operating Steps

1. Pump Preparation

Switch off the pump and disconnect it from the power supply to ensure safety.

Close any discharge and suction valves to prevent liquid leakage.

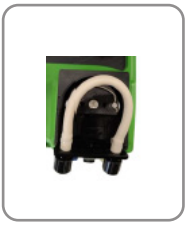
Drain any residual fluid remaining in the peristaltic tube.

2. Removal of the Old Semi-Assembly

Open the pump cover to access the slide and the tube.

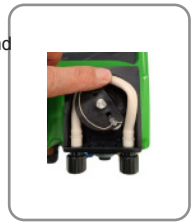
3. Remove the rotor cover disc

4. Remove the slide with the worn tube, taking care not to damage the rollers and the pump housing.



5. Insert and secure the slide with the new tube into the pump, ensuring it is correctly aligned.

6. Position the tube using the pin wrench or manually by rotating the roller carrier and guiding the tube while pressing it inward toward the pump housing.



7. Inspection and Test

Manually rotate the rollers to ensure that the tube is correctly positioned and moves freely without obstruction.

Reinstall the rotor cover disc.

Close the pump cover.
Restore the power supply and start the pump to perform a dry run test.

Warning: If the roller carrier is removed, always ensure that during reassembly the “A” marking is oriented toward the operator.

PRECAUTIONS RELATING TO DIRECTIVES, REGULATIONS AND STANDARDS

§ CE/EU and UKCA Marking

It is guaranteed that this product complies with the essential requirements of the applicable Directives and Regulations in accordance with the following specifications. Carefully consider the following specifications when using the product in European Union Member States and in the United Kingdom.

CE/EU Directives and Harmonized Standards

Directives
DIRECTIVE 2006/42/EC
DIRECTIVE 2014/35/EU
DIRECTIVE 2014/30/EU
DIRECTIVE 2011/65/EU
COMMISSION DELEGATED DIRECTIVE (EU) 2015/863

Harmonized Standards
EN ISO 12100
EN 809
EN ISO 20361
EN IEC 61326-1
EN 61010-1
EN IEC 63000

UKCA Regulations and Harmonized Standards

Regulations
2008 No. 1597
2008 No. 1091
2016 No. 1101
2012 No. 3032

Harmonized Standards
BS EN ISO 12100
BS EN 809
BS EN ISO 20361
BS EN IEC 61326-1
BS EN 61010-1
BS EN IEC 63000

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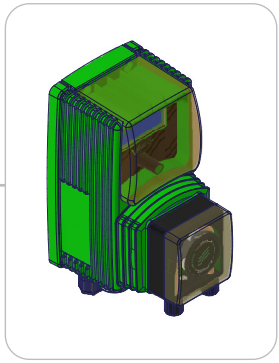

Tutti i materiali utilizzati per la costruzione della pompa dosatrice e per questo manuale possono essere riciclati e favorire così il mantenimento delle incalcolabili risorse ambientali del nostro Pianeta. Non disperdere materiali dannosi nell'ambiente! Informatevi presso l'autorità competente sui programmi di riciclaggio per la vostra zona d'appartenenza!