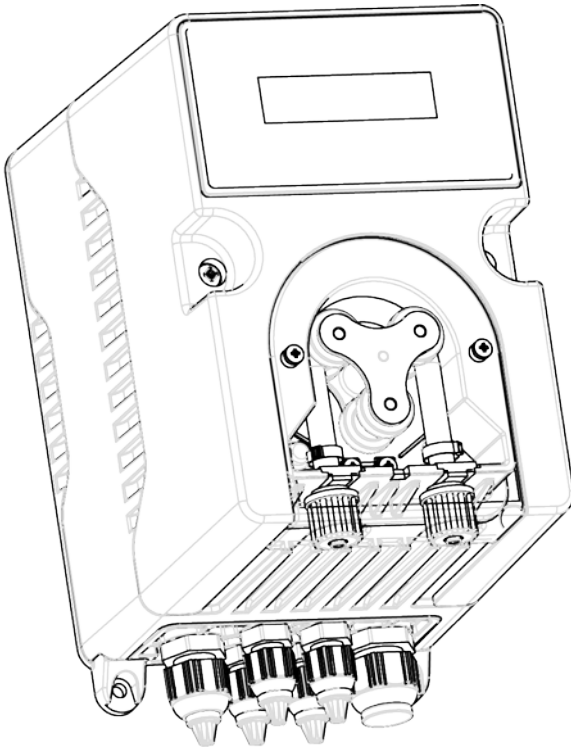


## KRONOS 50 KR AND KK SERIES TECHNICAL DATA



# DOSING PUMP

## Kronos 50 KR and KK SERIES



### FUNCTIONS:

- Adjustable flow rate
- Proportional
  - 4...20mA
  - 0...10V
  - 1:N
  - N:1
- PPM
- Batch
- Conductivity
- Password
- Statistics
- Remote STOP possibility

### Technical characteristics

- **FLOW RATES**
  - 2...15000 ml/h
- **BACK PRESSURE**
  - 0,1...3 bar
- **POWER SUPPLY**
  - 100...240 Vac - 50/60 Hz - 20 W
- **CONDUCTIVITY RANGE**
  - 200 $\mu$ S...15000  $\mu$ S with conductivity probe
  - 200 $\mu$ S...50000  $\mu$ S with inductive probe
- **MATERIALS**
  - **ENCLOSURE:** ABS
  - **PUMP HEAD:** PP
  - **TUBES:** Santoprene  
Sekomed  
Sekoextra  
Sekotech  
Sekofort
- **DOSING**
  - By stepper motor technology
  - Safely up to 15 l/h and up to 3 bar
  - Suitable firmware micro dosing
  - Minimum dosing rate 2 ml/h
- **MOTORS**
  - Accurate, reliable and silent (<35 db)

Kronos is the most complete and reliable series of peristaltic pumps ever produced by Seko. As a result of 35 years of experience, Kronos is able to adapt to the most simple applications, covering at the same time also complex solutions in industrial plants where accuracy in the chemical feeding and ability to operate in harsh environments are needed, in addition to ease of installation and low maintenance costs.

# DOSING PUMP

## Kronos 50 KR and KK SERIES



### PUMP KEY CODE

1°	Family					
KR	Kronos 50 peristaltic pumps					
KK	Kronos 50 peristaltic pumps special version					
2°	Model and functions					
Model	Functions					
FM	Adjustable flow rate – Manual – 4...20 mA – PPM – 1:n – n:1 – Batch					
FF	Adjustable flow rate – Manual – 4...20 mA - 0...10 V – PPM – 1:n – n:1 – Batch					
IR	Adjustable flow rate – Conductivity measure by inductive probe (200...50000µS)					
CR	Adjustable flow rate – Conductivity measure by conductivity probe (200...15000µS)					
3°	Max Back Pressure					
00	0,1 bar					
02	2 bar					
03	3 bar					
4°	Max Flow Rate (Flow rate range)					
02	2 l/h (2...2000ml/h)					
08	8 l/h (8...8000ml/h)					
10	10 l/h (10...10000ml/h)					
15	15 l/h (15...15000ml/h)					
5°	Power Supply					
A	230 Vac 50/60 Hz 20 W					
B	24 Vac 50/60 Hz 20 W					
C	115 Vac 50/60 Hz 20 W					
D	24 Vdc 20 W					
M	100...240 Vac 50/60 Hz 20 W					
6°	Tubes					
1	Santoprene					
2	Sekobril					
3	Sekoflex					
4	Sekokem					
5	Sekoextra					
6	Sekomed					
7	Sekotech					
8	Sekofort					
7°	Options					
000	Standard					

KR	FM	03	02	M	5	000
----	----	----	----	---	---	-----

# DOSING PUMP

## Kronos 50 KR and KK SERIES



### RESUME TABLE

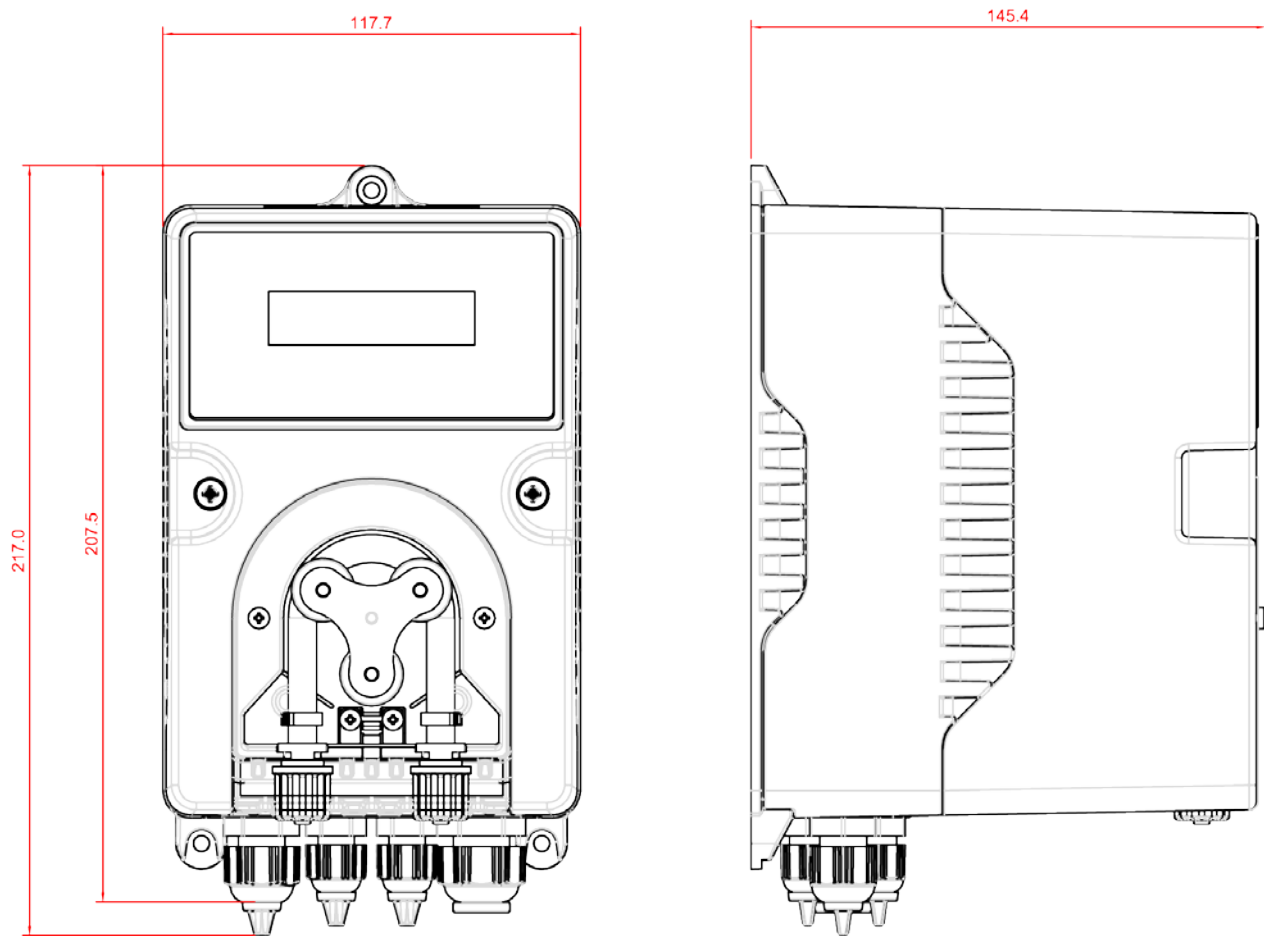
Code	Family	Model	Back Pressure bar (psi)	Min Flow Rate l/h (ml/min)	MAX Flow Rate l/h (ml/min)	Power Supply	Tube
KR FM 00 15 M 1	KR	FM	0,1 (1,5)	0.0015 (15)	15 (15000)	100...240 Vac 50/60 Hz 20 W	Santoprene
KR FM 02 10 M 6	KR	FM	2 (30)	0.0010 (10)	10 (10000)	100...240 Vac 50/60 Hz 20 W	Sekomed
KR FM 03 02 M 5	KR	FM	3 (44)	0,0002 (2)	2 (2000)	100...240 Vac 50/60 Hz 20 W	Sekoextra
KR FF 02 10 M 6	KR	FF	2 (30)	0.0010 (10)	10 (10000)	100...240 Vac 50/60 Hz 20 W	Sekomed
KR IR 02 10 M 6	KR	IR	2 (30)	0.0010 (10)	10 (10000)	100...240 Vac 50/60 Hz 20 W	Sekomed
KR CR 02 10 M 6	KR	CR	2 (30)	0.0010 (10)	10 (10000)	100...240 Vac 50/60 Hz 20 W	Sekomed
KK FM 03 02 M 8	KK	FM	3 (44)	0,0002 (2)	2 (2000)	100...240 Vac 50/60 Hz 20 W	Sekofort
KK FM 03 08 M 7	KK	FM	3 (44)	0,0008 (8)	8 (8000)	100...240 Vac 50/60 Hz 20 W	Sekotech

# DOSING PUMP

*Kronos 50 KR and KK SERIES*



## DIMENSIONS



# 1. SAFETY INFORMATION

Explanation of the safety information.



Warning – high- voltage



Warning – hot surface



Warning – danger zone

## Correct and proper use

- The pump may only be used to meter liquid feed chemicals.
- The system may only be used in accordance with the technical data and specifications outlined in the Operating Manual.
- The pump may only be used if it has been correctly installed and commissioned for use.
- Any other uses or modifications are prohibited.
- The pump is not intended to meter gaseous media or solids.
- The pump may not be used outdoors without additional protection (covering, weather protection roof).
- The pump should only be operated by trained and authorized personnel, see the following table.
- You are obliged to observe the information contained in the operating instructions at the different phases of the system's service life.

## Technical personnel

A qualified employee is deemed to be a person who is able to assess the tasks assigned to him and recognize possible hazards based on his/ her technical training, knowledge and experience, as well as knowledge of pertinent regulations.

## Electrician

Electricians are deemed to be people, who are able to complete work on electrical systems and recognize and avoid possible hazards independently based on their technical training and experience, as well as knowledge of pertinent standards and regulations. Electricians should be specifically trained for the working environment in which they are employed and know the relevant standards and regulations. Electricians must comply with the provisions of the applicable statutory directives on accident prevention.

## Instructed personnel

An instructed person is deemed to be a person who has been instructed and, if required, trained in the tasks assigned to him/her and possible dangers that could result from improper behavior, as well as having been instructed in the required protective equipment and protective measures.

## Protective equipment

The transparent cover on the liquid end serves to prevent persons touching the moving rotor and prevents metering medium leakage in the event of a hose fracture.

### Information in the event of an emergency

Remove the mains plug or press one of the emergency stop buttons, if fitted, in the event of an emergency.

If feed chemical escapes, also depressurize the hydraulic system around the pump. Observe the safety data sheet for the feed chemical.

## 2. ABOUT THIS PRODUCT

The **Kronos** is a peristaltic metering pump drive by a stepper motor. The feed chemical is conveyed by means of the rotor squeezing on the hose. No valves are needed for this. This ensures gentle handling of the metered media.

Typical applications are in processes where only a low discharge pressure is required, such as in the metering of chemicals into galvanic baths, in clarification tanks or for metering conditioning agents into swimming pools (flocculants, activated carbon and chemicals).

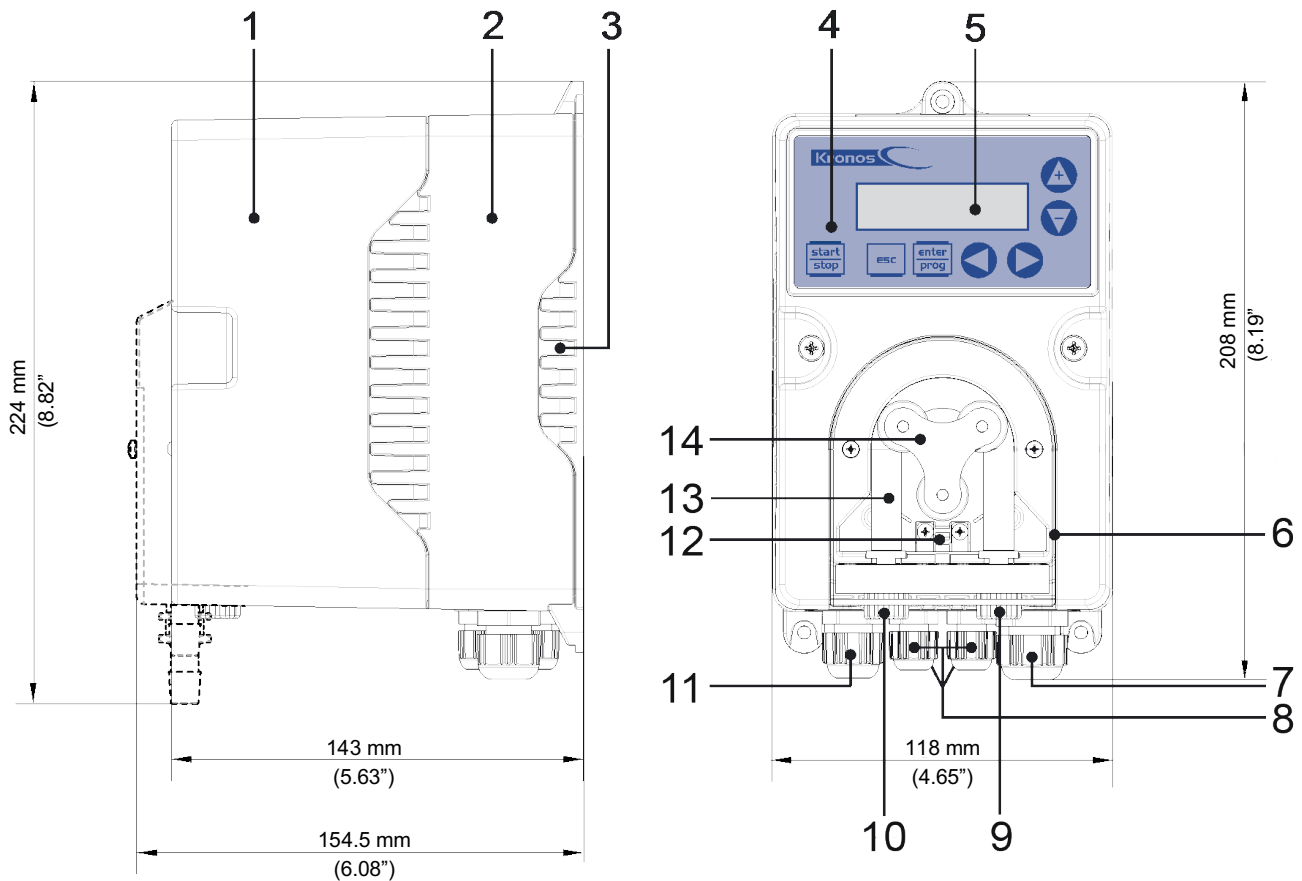
The housing is made from shock-proof and chemical resistant PPE with IP65 protection degree.

It is equipped with several inputs for metering configuration. The stepper motor means that metering is infinitely adjustable.

The following provides an overview of the most important features:

- Power supply 100÷240 Vac 50/60 Hz
- Output range: see label in the pump.
- Powerful stepper motor, speed configurable
- Infinite adjustment of the metering output either manually or externally via 0/4-20 mA signals
- Priming function (high-speed run)
- Display of metering output on display in l/h, ml/m, Gph or %
- Reversible direction
- Housing protection class IP 65
- Tube breaking system
- Fuse 1.6A (20W)

### 3. DIMENSIONS AND DEVICE OVERVIEW



1	Housing: upper section	8	PCBs 7
2	Housing: central section	9	Discharge connector
3	Housing: bottom section	10	Suction connector
4	Control keys	11	PCB 9
5	LCD display	12	Hose rupture monitoring
6	Transparent cover	13	Pump hose
7	PCB 11	14	Rotor

### 4. DESIGN AND FUNCTIONAL DESCRIPTION

The pump is comprised of two main components:

- Driver unit (stepper motor)
- Liquid end (rotor, rollers and pump hose)

#### Operating unit

The device is housed in a robust plastic housing. The plastic housing is comprised of upper and lower sections, which are screwed together. The lower section contains the PCBs for power supply and connectors. The upper section of the housing accommodates the CPU, motor and display PCB with display and buttons.

The liquid end is mounted at the front and is closed off by means of a screwed transparent cover to protect against injuries. The pump hose can easily be exchanged after the transparent cover has been removed.

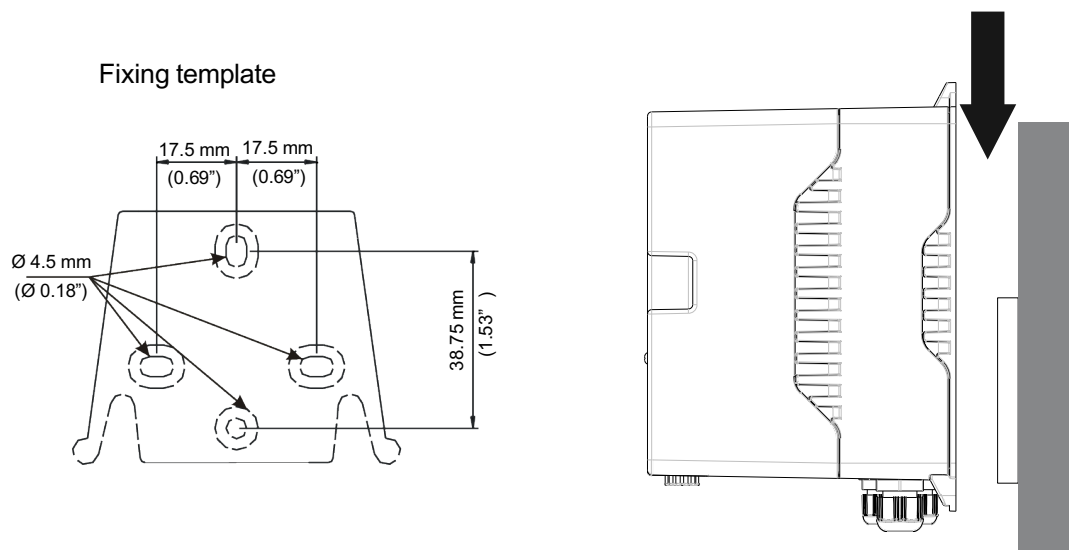
The rotary movement of the rotors alternately press and relax pump hose by three rollers. As a result, the liquid is sucked in and transported through the pressure hose.

The pump is operated by means of the operating unit. The desired metering level and mode are configured with this. The metering operation is controlled with the operating unit or via an external contact, level input.



## 5. INSTALLATION

1. Mark the bore holes on the wall
2. Drill the Ø 8 mm holes and insert the dowels supplied
3. Fix the bracket to the wall
4. Hook the device at the top



## 6. HYDRAULIC INSTALLATION

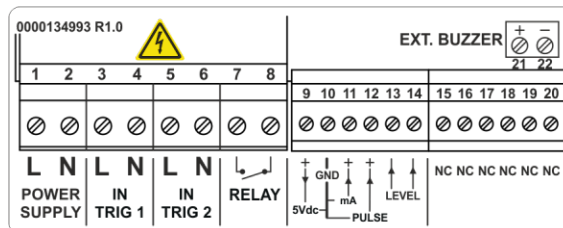
Mount the suction and discharge lines:

1. Cut off the ends of the hoses so that they are straight.
2. Screw on the cap nut and slide over the hose.
3. Screw in the hose end until it stops over the nozzle.
4. Connect the discharge line to the right-hand hose connection.
5. Connect the suction line to the left-hand hose connection.
6. Tighten up the cap nuts.
7. To do this, shorten the free end of the suction line so that the end hangs just above the container bottom.
8. If necessary, feed a hose line from the leakage fitting to the container.

## 7. ELECTRICAL INSTALLATION

1. Lay a power cable with short-circuit protection and mains switch - if necessary, with emergency stop switch.
2. Ensure that the mains power cable is dead and remains so!
3. Break out the small bore hole at the far right on the lower side of the back section by means of a screwdriver.
4. Screw in the corresponding screw and tighten up - not the scalping screw.
5. Insert the reducing inserts depending on the cable diameter being used and insert the threaded assembly.
6. Feed the mains cable into the threaded assembly.
7. Connect the mains cable to terminal block.
8. Tighten up the clamping screw so that the threaded assembly is moisture-proof.

## 7.1 Electrical Connections



Terminal number	Description			Electrical features
1 - 2	Power supply			100÷240 VAC (50–60Hz)
3 - 4	Trigger 1 input signal			24÷240 VAC or VDC
5 - 6	Trigger 2 input signal			24÷240 VAC or VDC
7 - 8	Alarm relay output			250VAC 8A
10 - 11	11	Pole + (mA)	Input mA	0/4÷20 mA (Input impedance: 200 ohm)
	10	Pole - (GND)		
10 - 12	10	Pole - (GND)	Pulses input	Pulses free from voltage (pulse emission meter; dry contact: on-off, maximum frequency 1KHz)
	12	Pole + (Pulse)		
13 - 14	Level control probe input			Dry contact (on-off)
15 ÷ 20	Not used			Not used
21 - 22	21	Pole +	External buzzer	20÷24 VDC
	22	Pole -		

Fast connection with polarized connector for frequency input



Connector	Terminal block Kronos50 pump
Pin 1 GND (-)	Terminal 10 GND (-) negative input
Pin 2 Pulse (+)	Terminal 12 Pulse (+) positive input
Pin 3 none	
Pin 4 none	
Pin 5 none	

## 8. OPERATING UNIT

### 8.1 Control Keys



The control keys are designated as follows:

Key	Description
	Starts and stops the pump. In the event of a level alarm (alarm function only), flow alarm and active memory alarm, it deactivates the signal on the display.
	Used to "exit" the various menu levels. Before definitively exiting the programming phase, you will be asked if you wish to save any changes.
	When pressed during the pump operation phase, it cyclically displays the programmed values on the display.  When pressed at the same time  or  keys, it increases or decreases a value dependent on the selected operating mode. During programming it carries out an "enter" function, meaning that it confirms entry to the various menu levels and modifications within the same.
	Used to run upwards through the menu
	Used to run downwards through the menu or for the priming, keeping it there for at least 3 seconds, pump start running at 100% until the  key is pressed.
	Used to increase the numerical values to be changed. Can be used to start dosage in Batch mode.
	Used to decrease the numerical values to be changed.

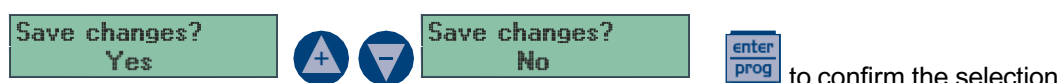
### 8.2 Programming menu

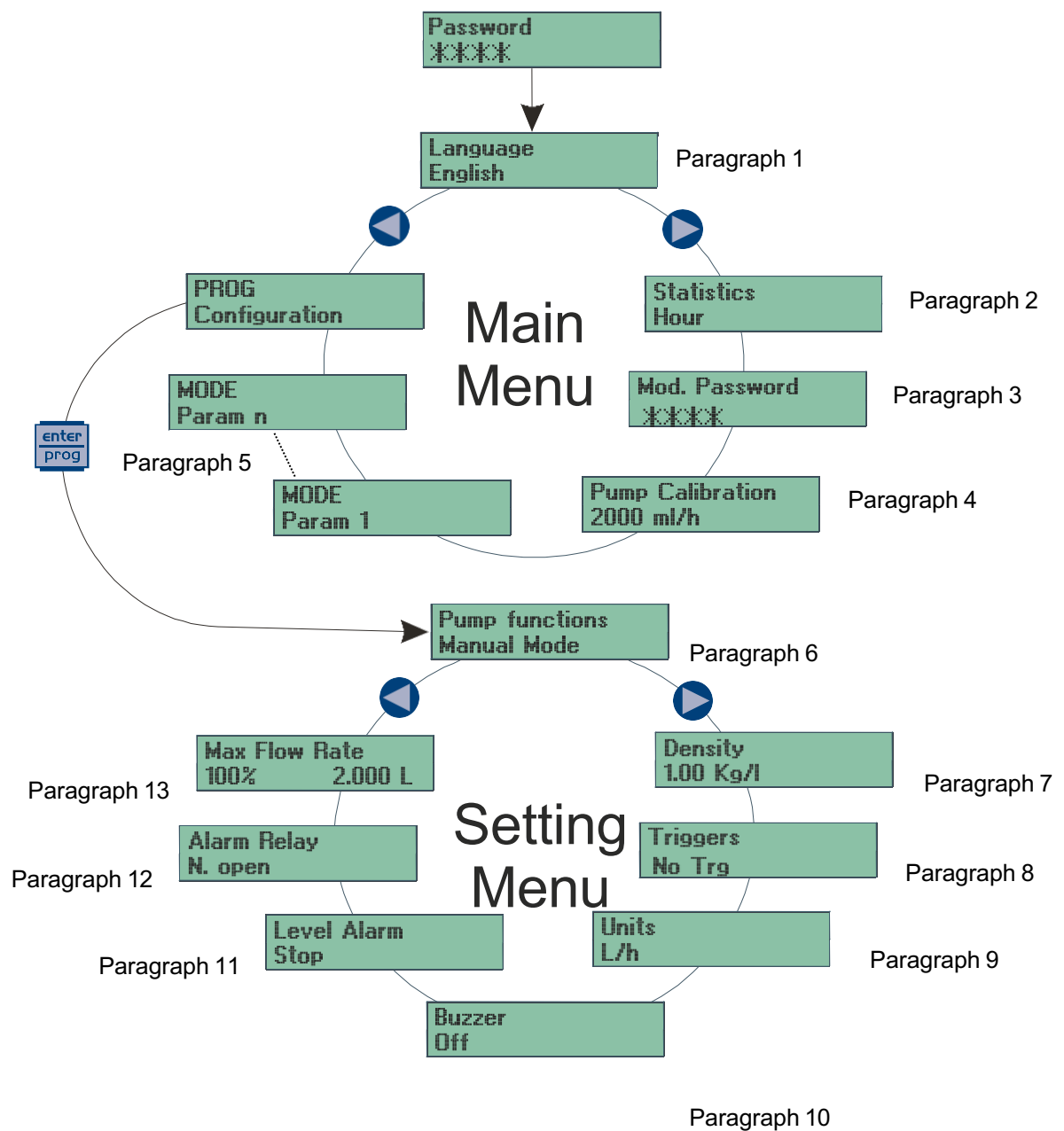
You can access the programming menu by pressing the key.

The keys can be used to run through the menu items, with the key being used to access changes.

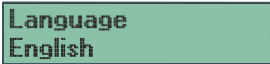




The pump is programmed in constant mode in the factory. The pump automatically returns to the operating mode after 1 minute of no activity. Any data entered in these circumstances will not be saved.

The key can be used to exit the various programming levels. Upon exiting programming, the display will show:











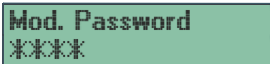




### Paragraph 1

Programming	Operation
	<p>Makes it possible to select the language. The pump is set in English in the factory.</p> <p>Changes can be made by pressing the  key, then using the   keys to set the new value.</p> <p>Press  to confirm and return to the main menu.</p>





### Paragraph 2

Programming	Operation
	<p>The main menu displays the pump operation times. By pressing the  key you can access other statistics:</p> <ul style="list-style-type: none"> <li>- Tubing hours = tubing operation times.</li> <li>- Q.ty (liters) = quantity dosed by the pump in liters.</li> <li>- Reset = use the   to reset the counters (YES) or otherwise (NO), then confirm by pressing the  key.</li> </ul> <p>Pressing the  key will take you back to the main menu.</p>

### Paragraph 3

Programming	Operation
	<p>Makes it possible to change the access password.</p> <p>Changes can be made by pressing the  key, then using the   keys to set the new value.</p> <p>To disable the password, enter the value 0000.</p> <p>Pressing the  key will take you back to the main menu.</p>

#### Paragraph 4

Programming	Operation
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Calibration 2000 ml/h</div>	<p>The pump can be calibrated as follow:</p> <p>the pump run at the maximum speed for 36 sec (version 10 l/h) or 180 sec (version 2 l/h) , which is started by pressing the  key.</p> <p>At the end of this time, enter the quantity sucked up by the pump using the   keys and confirm by pressing the  key.</p> <p>The entered figure will be used in flow calculations.</p>

#### Paragraph 5

These items menu are different depending on the settings:

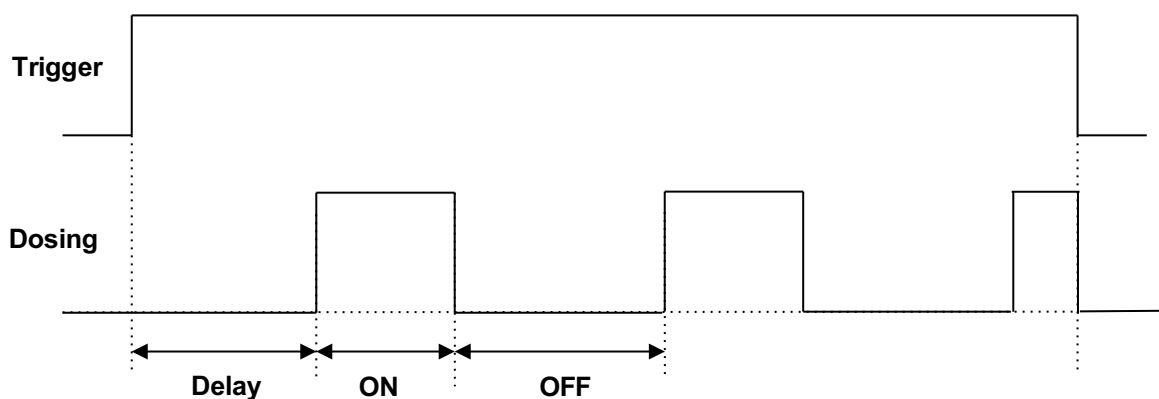


- **Manual Mode**
- **PPM Mode**





#### Case **Manual Mode**:

Pump doses at selected flow rate. If OFF Time is set to 0sec, pump runs continuously.  
Pump start dosing after a selectable Delay time.

Ex. Manual Dosing with trigger:



If no trigger is selected, pump start delay counting after power-on.





Programming	Operation
<pre> graph TD     A[Manual MODE ON Time sec] --&gt; B[Manual MODE OFF Time sec]     B --&gt; C[Manual MODE DELAY Time sec] </pre>	<p>The pump operates in constant mode. The flow can only be manually regulated by pressing the   keys at the same time to increase the flow, or the   keys to decrease it.</p> <p>Makes it possible to set:</p> <ul style="list-style-type: none"> <li>• <b>ON Time</b>= Time for which the pump runs.</li> <li>• <b>OFF Time</b>= Time for which the pump is stopped.</li> <li>• <b>DELAY Time</b>= time delay after which the pump starts to run.</li> </ul>

### Case PPM Mode:

In order to maintain the selected ppm of chemical, The pump calculates the right dosing rate starting from the following parameters:

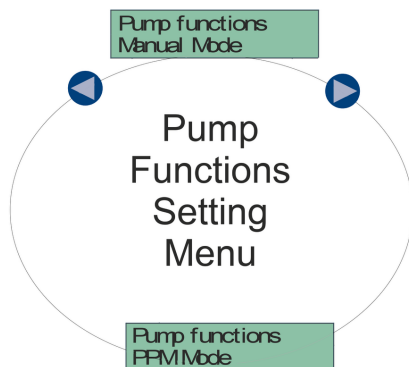
- Pulse per minute on pulse input
- Flowmeter factor (pulse/liter)
- Density of chemical
- Concentration of chemical

If calculated flow rate is bigger than maximum, the pump goes in MEM function (if selected) and doses the lasting quantity when possible.

Programming	Operation
<pre> graph TD     A["PPM MODE Conc.(%) 100%"] --&gt; B["PPM MODE Memory Off"]     B --&gt; C["PPM MODE 1/1 p/L"]     C --&gt; D["PPM MODE Set P. 100.0ppm"] </pre>	<p>The pump doses in proportion to an external signal (i.e.: impulse launch counter), automatically calculating the relationship between incoming signals and pump speed on the basis of the programmed ppm value.</p> <p>The dosage frequency can be modified during operation, by pressing the   keys at the same time to increase the flow, or the   keys to decrease it.</p> <p>Makes it possible to set:</p> <ul style="list-style-type: none"> <li>• <b>Conc.(%)</b>= product concentration.</li> <li>• <b>Memory</b>= The pump has a memory function, which signals the reception of a signal during dosage. If set to Off, it merely sends a signal, if set to On it sends a signal and memorizes the impulses, then executes them when it has finished receiving signals</li> <li>• <b>1/1</b>= number of impulses per liters (1/1-999/999) and consequently the system will dose according to the values set.</li> <li>• <b>Set P.</b>= ppm value that the system will dose.</li> </ul>

## Paragraph 6

Makes it possible to set the Pump Functions as follow:



## Paragraph 7

Programming	Operation
<div>Density 1.00 kg/L</div>	This makes it possible to set the density of the chemical product.

## Paragraph 8


Programming	Operation
<div>Triggers No Trg</div>	<p>This makes it possible to set the input triggers. When the triggers are present, gives consent to the pump to run, depending the setting pump function:</p> <ul style="list-style-type: none"><li>• <b>No Trg</b>= the triggers are disabled.</li><li>• <b>Trg 1</b>= the pump run when only the trigger 1 is enabled.</li><li>• <b>Trg 2</b>= the pump run when only the trigger 2 is enabled.</li><li>• <b>Trg 1&amp;2</b>= the pump run when the both triggers (1&amp;2) are enabled.</li></ul>

## Paragraph 9


Programming	Operation
<div>Units L/h</div>	<p>This makes it possible to set unit of measurement, which can be:</p> <ul style="list-style-type: none"><li>• L/h= liter per hour.</li><li>• ml/m= milliliter per minute.</li><li>• Gph= Gallon per hour.</li><li>• %= the percentage of the maximum flow-rate.</li></ul>




### Paragraph 10

Programming	Operation
	The buzzer is active when there is an alarm condition. This makes it possible to set the buzzer the system to On or Off.

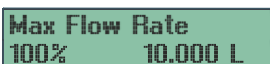
### Paragraph 11

Programming	Operation
	This makes it possible to set the level alarm as follow: <ul style="list-style-type: none"><li>• <b>Stop</b>= the pump stops.</li><li>• <b>Run</b>= the pump keeps running.</li></ul>

### Paragraph 12




Programming	Operation
	This makes it possible to set the alarm relay as follow: <ul style="list-style-type: none"><li>• <b>N.Open</b>= normally open.</li><li>• <b>N.Closed</b>= normally closed.</li></ul>



### Paragraph 13

Programming	Operation
	This makes it possible to set the maximum flow offered by the pump, and the programmed mode (% or frequency) is used as the standard unit of measurement when displaying the flow.




## 9. Maintenance

### 9.1 Tubing change

With the pump in **Stop** (press the  key), by pressing the  key for at least 3 seconds the pump run anticlockwise at the minimum speed in order to facilitate the removing hose, to terminate the running pump press the  key.

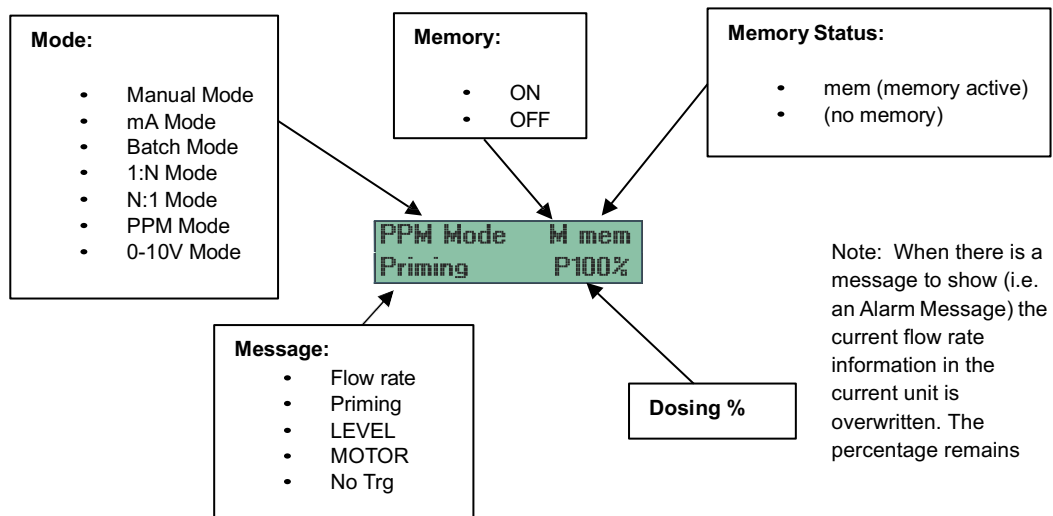
With the same procedure, by pressing the  key for at least 3 seconds the pump run clockwise at the minimum speed in order to facilitate the replacing hose, to terminate the running pump press the  key.

### 9.2 LCD Contrast

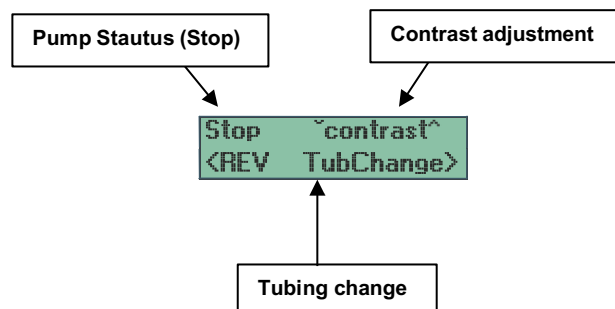
With the pump in **Stop** (press the  key), by pressing the  and  keys to increase or decrease the contrast.

## 10. Display view


### 10.1 During the dosage



### 10.2 During the Stop



## 11. QUICK PARAMETER SETTING

From dosing visualization mode, by pressing for at least 3 seconds the  key, the display will show the quick setting menu:



Manual Mode  
15.0 l/h

In this menu you can change the following items:

### 1) Max Flow Rate in:

- mA Mode
- 0-10V Mode
- Manual Mode

Note: the information is shown both, in the current units (i.e. l/h) and also in percentage of the maximum

### 2) N in:




- 1:N Mode
- N:1 Mode

### 3) Quantity in:

- Batch Mode

### 4) ppm in

- ppm Mode

To modify the current value keeping pressed the  with  or  keys.

## 12. Parameter List

	Parameter	Value	Value	Value	Value	Value	Value	Default
1	Language	english	german	italian	french	spanish		english
2	Password	0 - 9999						0 (disabled)
3	Statistics	dosing hours	tubing hours	liters				
4	Max flow rate	0.1 – 100.0%						100.0%
5	Pump Function	Manual Mode	mA Mode	Batch Mode	1 :N Mode	N :1 Mode	Ppm Mode	Manual Mode
6	Alarm Relay	N. Open	N.Closed					N.Open
7	Level Alarm	Stop	Run					Stop
8	Buzzer	ON	OFF					OFF
9	Unit	ml/h	L/h	%				ml/h
10	Trigger	No Trg	Trg 1	Trg 2	Trg 1&2			No Trg
11	Density	0.50-2.00						1.00
12	On Time	0-10000						10
13	Off Time	0-10000						0
14	Delay Time	0-10000						0
15	mA for 0%	0.0-20.0						4.0
16	mA for max	0.0-20.0						20.0
17	N	1-1000						1
18	pulse	1-2000						1
19	liter	1-2000						1
20	Chem. Conc.	1-100						100
21	ppm	0-3000						100.0
22	memory	ON	OFF					OFF
23	quantity	0-30000						100
24	time	0-10000						100
25	Flow rate	Calibr.						\

## 13. Dosing parameter Table

Mode	Param 1	Param 2	Param 3	Memory	Trigger	Max flow rate	Density
Manual	ON Time sec ( <u>0</u> -10000)	OFF Time sec ( <u>0</u> -10000)	DELAY Time sec ( <u>0</u> -10000)		TRIGGER ( <b>No Trg</b> /Trg 1/Trg 2/Trg 1&2)	MAX FLOW RATE (0.1 – <b>100</b> %)	
Direct or Inverse mA	mA Input for min dosing ( <u>0.0</u> -20.0 mA)	mA Input for max dosing (0.0- <u>20.0</u> mA)			TRIGGER ( <b>No Trg</b> /Trg 1/Trg 2/Trg 1&2)	MAX FLOW RATE (0.1 – <b>100</b> %)	
PPM	Set Point ( <u>1</u> -3000 ppm)	Flowmeter factor (1-2000 pul / 1-2000 Lit)	CHEM. CONC. (1- <b>100</b> %)	MEMORY (ON- <b>OFF</b> )	TRIGGER ( <b>No Trg</b> /Trg 1/Trg 2/Trg 1&2)		DENSITY (0.50 – 2.00 kg/L) <b>1.00</b>
Batch	Quantity ( <u>1</u> -30000ml)	Time sec ( <u>1</u> -10000)		MEMORY (ON- <b>OFF</b> )			DENSITY (0.50 – 2.00 kg/L) <b>1.00</b>
PROP 1:N	N ( <u>1</u> -1000)			MEMORY (ON- <b>OFF</b> )	TRIGGER ( <b>No Trg</b> /Trg 1/Trg 2/Trg 1&2)		
PROP N:1	N ( <u>1</u> -1000)			MEMORY (ON- <b>OFF</b> )	TRIGGER ( <b>No Trg</b> /Trg 1/Trg 2/Trg 1&2)		

Default parameters are typed bold and underlined

## 14. Alarms Table

alarm	dosing	Display	buzzer	Relay	solution
Tube Break	stop	TUBE BREAK	ON if selected	ON if selected	Replace hose, clean the contacts and power cycle the system
Level	Stop if selected	LEVEL	ON if selected	ON if selected	Restore the level of the chemical product
Motor	stop	MOTOR	ON if selected	ON if selected	Check the pump