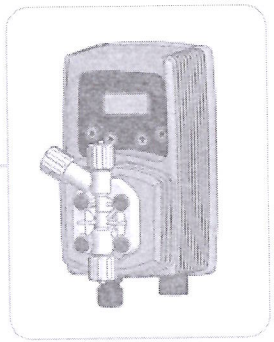
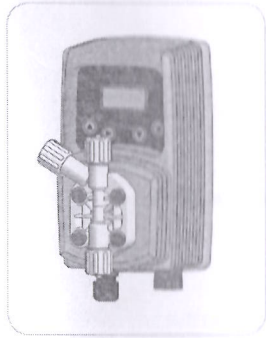


When dismantling a pump please separate material types and send them according to local recycling disposal requirements.
We appreciate your efforts in supporting your local Recycle Environmental Program.
Working together we'll form an active union to assure the world's invaluable resources are conserved.

This operating instructions contains safety information that if ignored can endanger life or result in serious injury. They are indicated by this icon.

Use of this pump with radioactive chemicals is forbidden!

Keep the pump protected from sun and water.
Avoid water splashes.



OPERATING MANUAL FOR "VMSA H_2O_2" DOSING PUMP

Read Carefully !

ENGLISH Version

R1-05-09

VMSA-H
FP0704

NORME CE
EC RULES(STANDARD EC)
NORMAS DE LA CE

Direttiva Basso Voltaggio
Low Voltage Directive
Directiva de baja tensión
} 2006/95/CE

Direttiva EMC Compatibilità Elettromagnetica
EMC electromagnetic compatibility directive
EMC directiva de compatibilidad electromagnética
} 2004/108/CE

GENERAL SAFETY GUIDELINES

Attention! In emergencies the pump should be switched off immediately!
Disconnect the power cable from the power supply!

When using pump with aggressive chemicals observe the regulations concerning the transport and storage of aggressive fluids!

When installing always observe national regulations!

Manufacturer is not liable for any unauthorized use or misuse of this product that may cause injury, damage to persons or materials.

Caution! Pump must be accessible at all times for both operating and servicing.
Access must not be obstructed in any way!

Feeder should be interlocked with a no-flow protection device.

Pump and accessories must be serviced and repaired by qualified and authorized personnel only!

Always discharge the liquid end before servicing the pump!

Empty and rinse the liquid end before work on a pump which has been used with hazardous or unknown chemicals!

Always read chemical safety datasheet!

Always wear protective clothing when handling hazardous or unknown chemicals!

Introduction:

Metering Pumps "VMSA H_2O_2" Series are the ideal solution for low / middle dosing of chemicals. All control and setup parameters are available through a digital keyboard and they are displayed on a LCD backlit display. Pump has "Level" input, temperature probe input and standby as option.

Pump's capacity

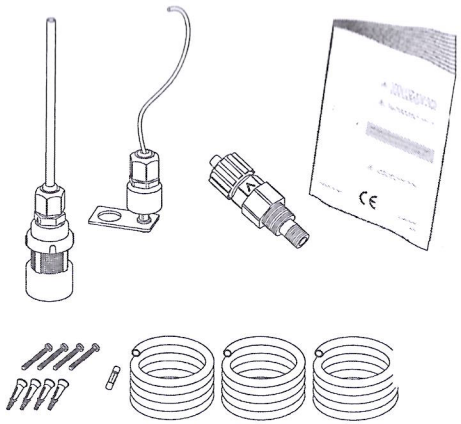
4l/h - 3bar with self venting pump head.

Included into package:

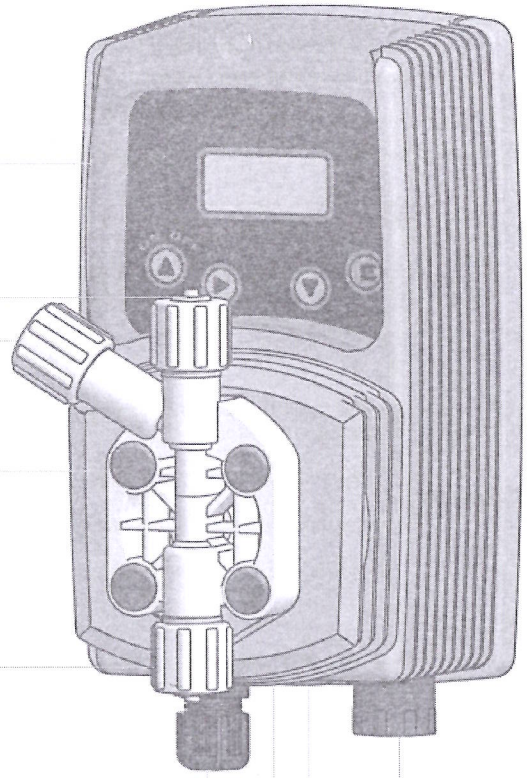
n.4	Dibbles ø6
n.4	Self tapping screws 4,5 x 40
n.1	Delayed fuse 5 X 20
n.1	Foot filter with valve
n.1	Injection valve
n.1	Level probe
m 2	Delivery pipe* (opaque PE)
m 2	Suction pipe * (transparent PVC)
m 2	Discharge pipe (PE)
n.1	This installation manual

* If hose is 6x8 there is only a 4meters long hose.
Cut to obtain suction and delivery hoses.

Remove the contents from the box.



PLEASE DO NOT TRASH PACKAGING.
IT CAN BE USED TO RETURN THE PUMP.



4. Before to Install warnings

installation and operativity is made in 4 main steps:

Pump's installation
Hydraulic Installation (hoses, level probe, injection valve)
Electrical Installation (main power connection, priming)
Programming the pump.

Before to start, please read carefully the following safety information.

Protective clothes

Wear always protective clothes as masks, gloves, safety glasses and further security devices during ALL installation procedure and while handling chemicals.

Installation location

Pump must be installed in a safety place and fixed to the table / wall to avoid vibration problems!

Pump must be installed in a easy accessible place!

Pump must be installed in horizontal position!

Avoid water splashes and direct sun!

Hoses and Valves

Suction and delivery hoses must be installed in vertical position!
All hoses connections must be performed using only hands' force!
No tongs required!

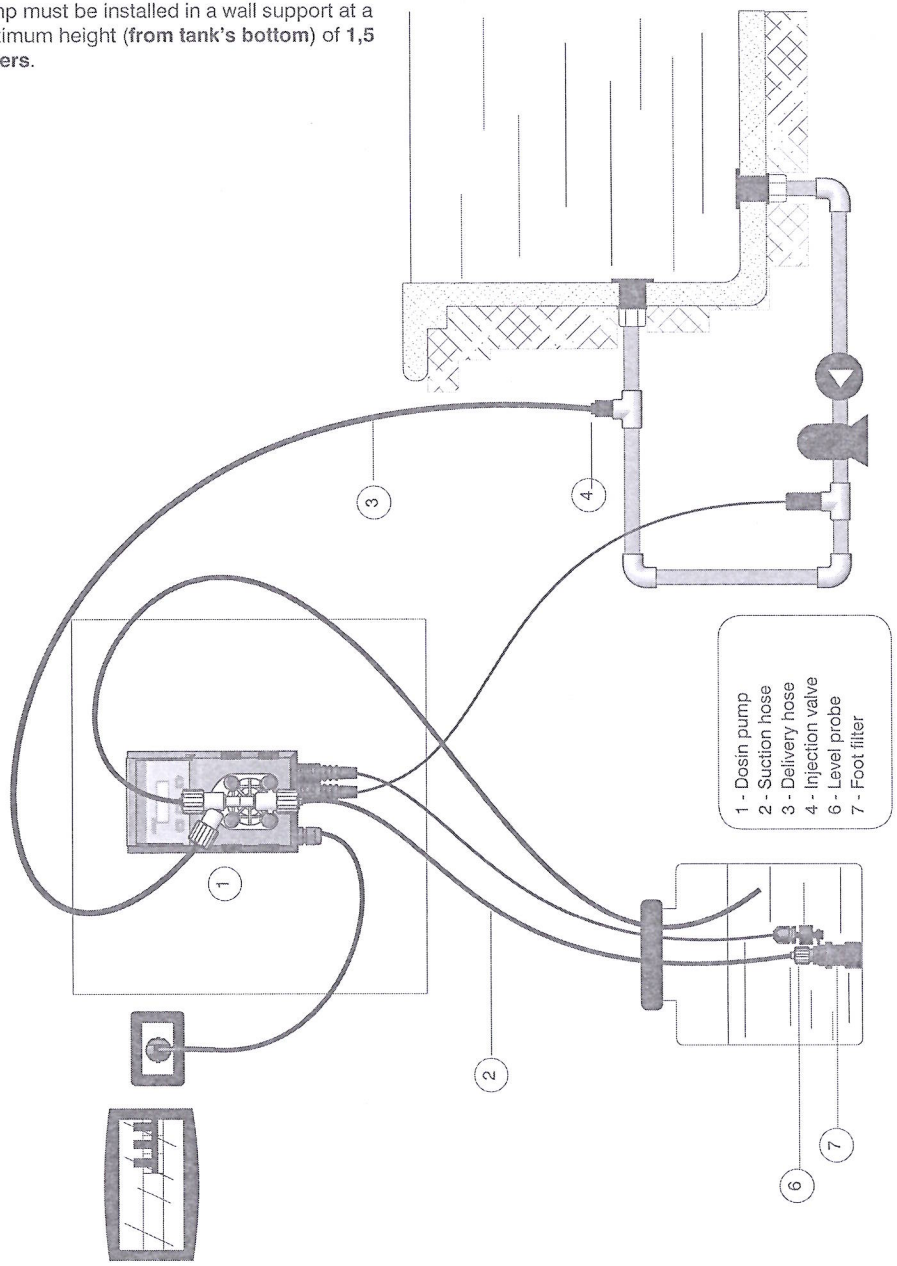
Delivery hose must be firmly fixed to avoid suddenly movements that could damage near objects!

Suction hose must be shorter as possible and installed in vertical position to avoid air bubbles suction!

Use only hoses compatibles with product to dose! See chemical compatibility table. If dosing product is not listed please consult full compatibility table or contact chemical's manufacturer!

5. Installation Draw

Pump must be installed in a wall support at a maximum height (**from tank's bottom**) of **1,5 meters**.



Hydraulic connections are:

Suction Hose with level probe and foot filter
Delivery Hose with injection valve
Discharge Hose

Suction Hose.

Completely unscrew tightening nut from pump's head and remove assembling components: *tightening nut, holding ring and pipe holder.*

Assembly as shown in fig. (A). Insert hose into pipe holder until it reaches the bottom.

Lock hose on pump's head by screwing down the tightening nut.
Use only hands to do it!

Connect other side of the hose to the foot filter using the same procedure.

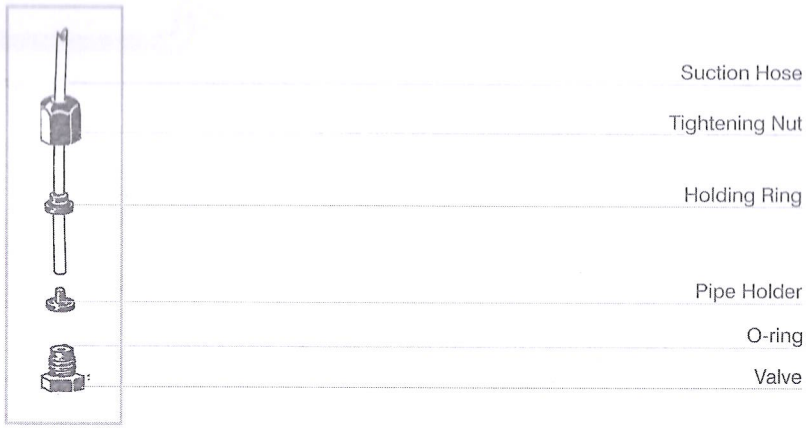


fig. (A)

Assembling foot filter with level probe.

Level probe must be assembled with foot filter using the provided kit.
Foot valve is made to be installed into tank's bottom without sediments priming problem.

Completely unscrew level probe's nut and assembly as described in fig. (B) **paying attention to the black ring: it must be inserted from floater side.**
Lock nut on the opposite side of the floater using hands only.

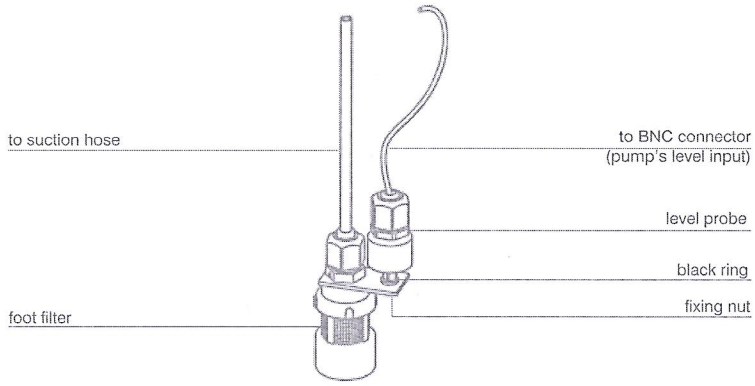


fig. (B)

Connect BNC from level probe into pump's level input (front side of the pump).
Put level probe assembled with foot filter into tank's bottom.

Warning: If there is a mixer installed into tank, install a suction lance instead of level probe / foot filter.

Delivery Hose.

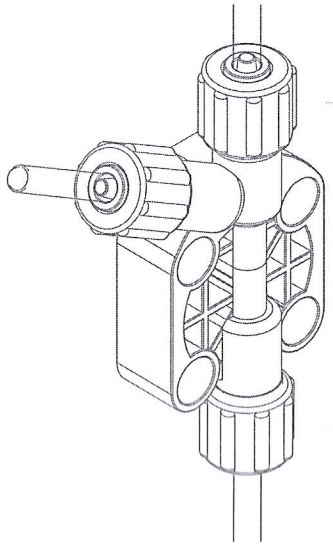
Completely unscrew tightening nut from pump's head and remove assembling components: *tightening nut, holding ring and pipe holder.*

Assembly as shown in fig. (A). Insert hose into pipe holder until it reaches the bottom.

Lock hose on pump's head by screwing down the tightening nut.
Use only hands to do it!

Connect other side of the hose to the injection valve using the same procedure.

ting pump head.



Self-venting pump head must be used when using chemicals that produce gas (i.e. hydrogen peroxide, ammonium, sodium hypoclorite at particular conditions).

Hoses assembling procedure (*including purge hose*) is described in fig. (A).

Notes:

- suction, delivery and purge valves are DIFFERENT! Do not exchange them!

- delivery and purge hoses are made of same material!

- it's allowed to lightly bend discharge hose!

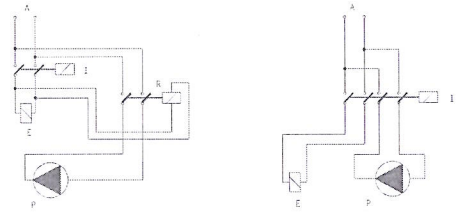
- during calibration procedure ("TEST") insert discharge hose into BECKER test-tube!

All electrical connections must be performed by **AUTHORIZED AND QUALIFIED** personnel only. Before to proceed, please, verify the following steps:

- verify that pump's label values are compatible with main power supply.

- pump must be connected to a plant with a differential switch (0,03A sensitivity) if there isn't a good ground.

- to avoid damages to the pump do not install it in parallel with heavy inductance load (for example: engines). A relay switch must be used. See below picture.

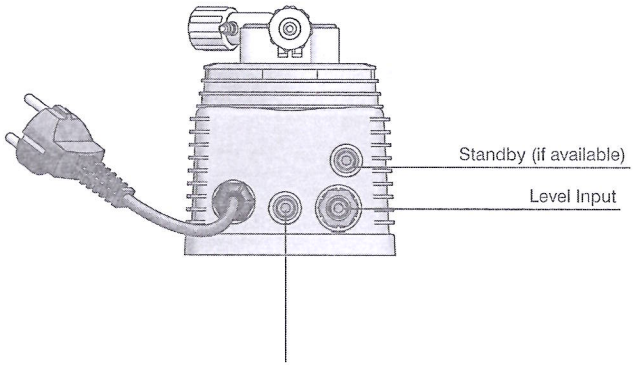


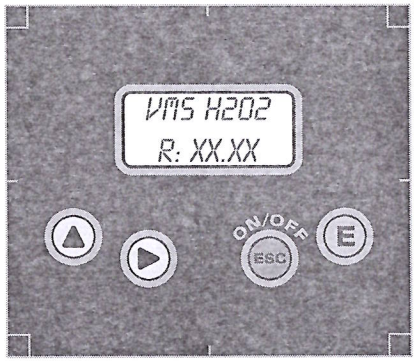
***P** - Dosing Pump*
***R** - Relay*
***I** - Switch or safety device*
***E** - Electrovalve or inductance load*
***A** - Main Power*

verified previous steps proceed as follows:

- check that "BNC" of level probe has been connected as described in "Hydraulic Installation" chapter.

- connect probe as described above





"UP" Key

ESC "ON/OFF" or "ESC" Key

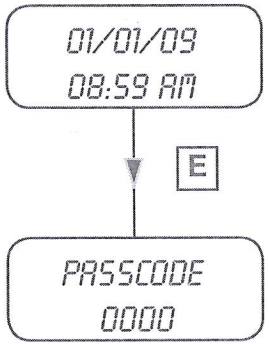
"RIGHT" Key

E "E" or "ENTER" Key

When pump is switched on it shows software release version prior to go into main screen. Use keyboard to operate the pump.

8.1 How to enter into setup menu

From main screen (date & hour or dosing activity) press "E" and enter passcode using "UP" key (digit) and "RIGHT" key (next digit) . Default passcode is 0000.

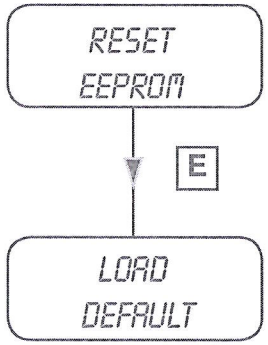


8.2 Switching ON and OFF the pump

From main screen press **"ON/OFF"** key to disable the pump. Press it again to re-enable the pump. During "OFF" mode all operations are suspended.

8.3 Resetting the pump

To revert the pump to factory settings enter into main menu (password protected) and press "UP" key until "RESET EEPROM" sub-menu appears. Press "E". Please note that all set parameters will be reverted to their original settings, password included.

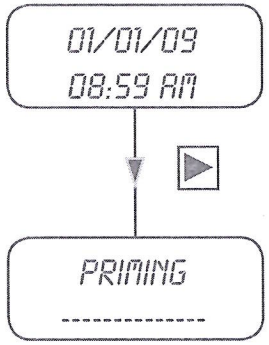


8.4 Setting the password

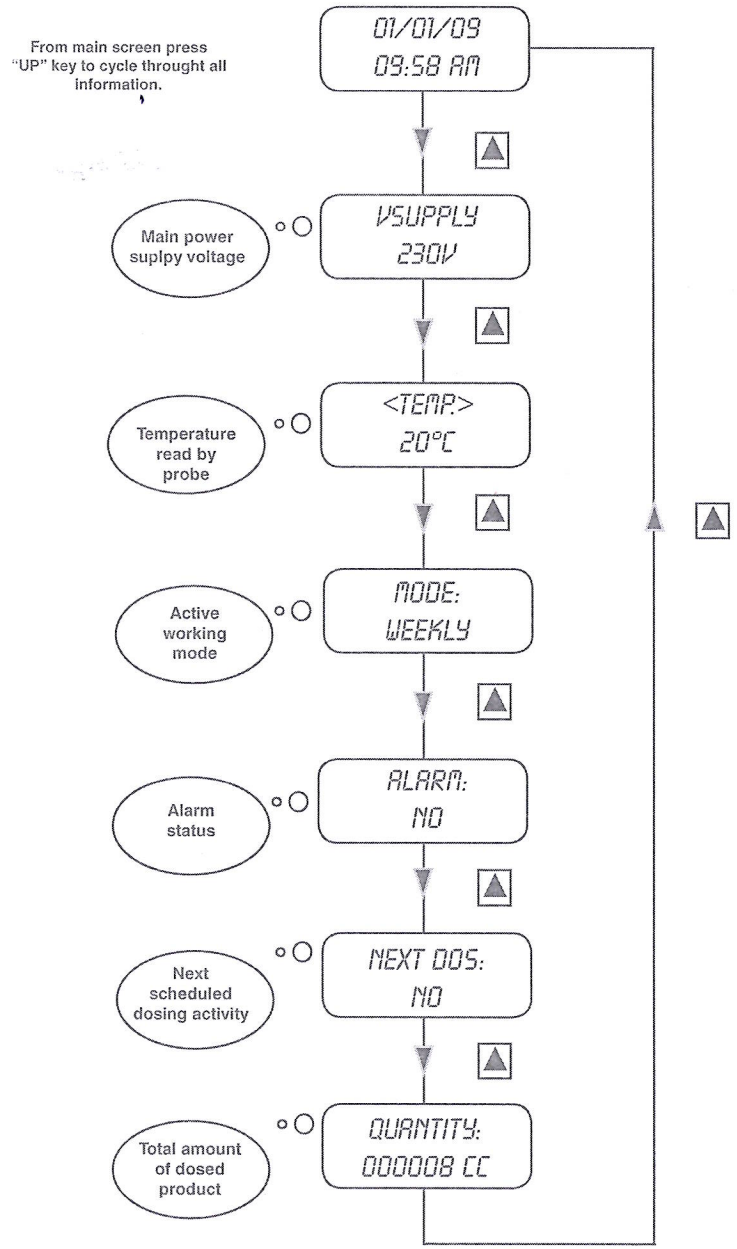
The passcode menu set a numeric code to protect main menu from unauthorized access.
Default value is "0000". Within "SET PASSCODE" menu use "**UP**" key to choose the number and press "**RIGHT**" to move on next digit. Finally press "E" to save the new passcode.

8.5 Priming

Ensure that pump is not connected to main supply. Connect hoses to the pump as described in previous chapter and open discharge knob (rotate counter clockwise). Power up the pump and wait for main screen then press and keep pressed "RIGHT" key. When product to dose will reach discharging hose release the key and close discharge knob (rotate clockwise).



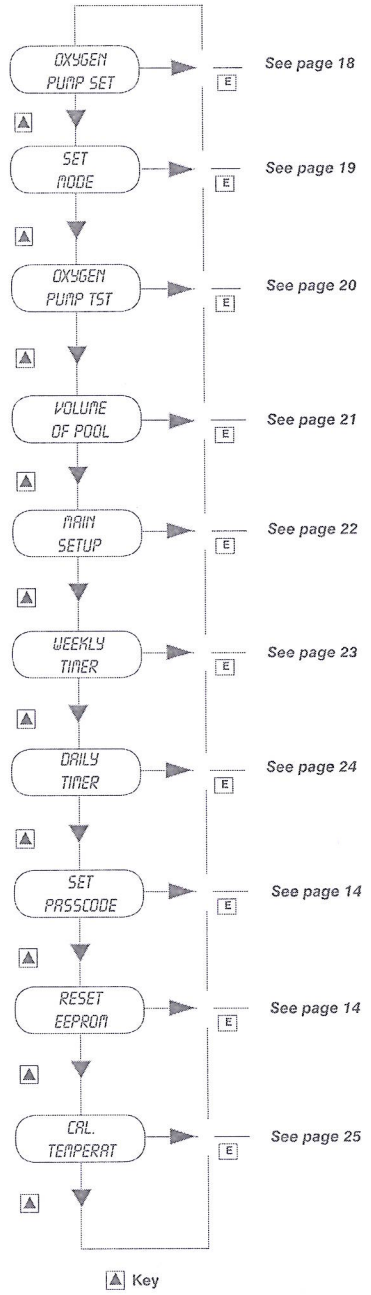
9. Main Screen Options

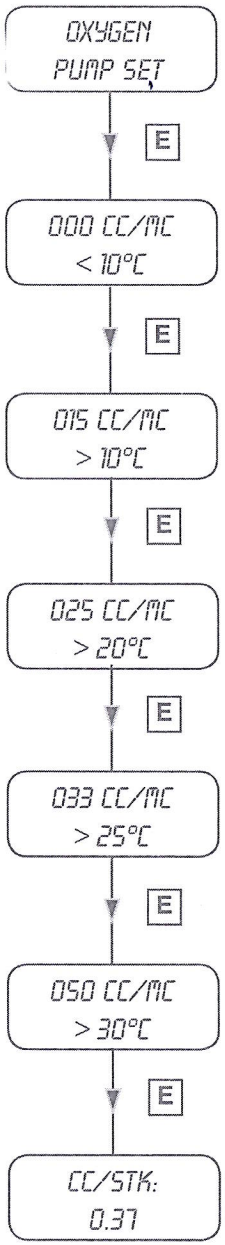


10. Setup menu

From main screen press "E" key and enter password to grant access to setup.

Default password is "0000".





11. Oxygen pump set.

This function defines how much quantity of product the pump have to dose within a week or on daily activity depending on configuration, pool's volume and pool's temperature.

Default parameters can be edited by using "UP" key (digit) and "RIGHT" key (next digit).

As last option CC/STK (max. 2.99) can be edited to set how many cc per strokes the pump have to produce. To obtain this value refer to "Oxygen Pump TST" menu.

E.I.:

Pool's volume:	50mc
Pool's temperature:	22°C
Working mode:	Weekly (3 days a week)
Starting time:	08:00 AM

Within selected days (3) the pump will dose 25cc/mc for 50mc.
The pump will dose 1250cc of chemical as total amount and 416cc of chemical as daily amount starting at 08:00 AM.

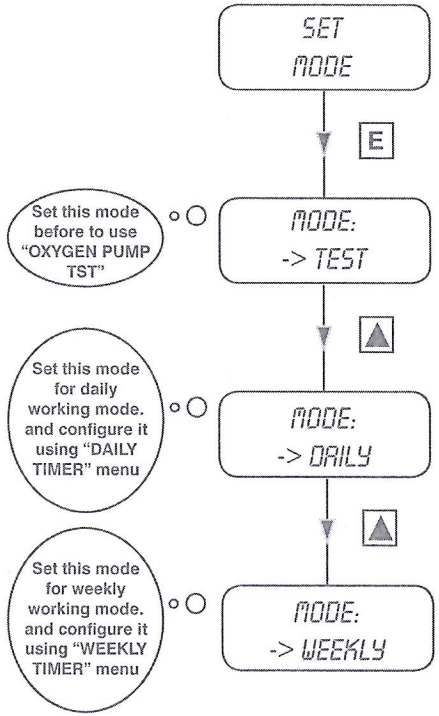
E.I.:

Pool's volume:	50mc
Pool's temperature:	22°C
Working mode:	Daily
Starting time:	08:00 AM
Feeding time:	3hours

Within a day (1) the pump will dose 25cc/mc for 50mc.
The pump will dose 1250cc of chemical as daily total amount starting at 08:00 AM and ending at 11:00 AM by spreading out the chemical during the feeding time.

11. Set mode.

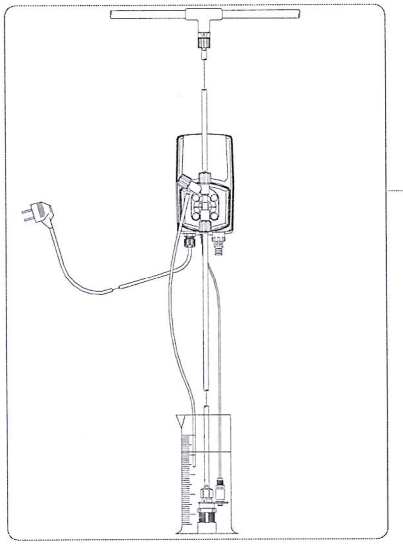
This function defines the pump's working mode. Choose mode using "UP" key and press "E" key to set it.



Note: remember to revert to "DAILY" or "WEEKLY" mode each time "TEST MODE" has been set to ensure pump's normal operativity.

13. Oxygen Pump TST

This function allows to define how many cc/st the pump is capable to produce. **Before to set this option be that "SET MODE" has been set to "TEST MODE".**



Pump's Calibration.
(or how enter cc/st value into "oxygen pump set "menu).

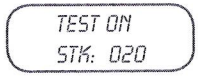
This procedure defines the cc quantity (cubical centimeters) that the pump feed during a single injection. To determine this value the pump must be calibrated.

1) Install the pump on plant and insert the suction hose (with its level probe / foot filter) into a BEKER "test-tube". If pump's model is self-priming put the discharge hose into the "test-tube" too.

2) Power up the pump.

3) Fill up the "test-tube" with the chemical until to reach a known value.

4) From "SET MODE" menu choose "TEST MODE" and go to "OXYGEN PUMP TST" menu.



5) Press "**E**". The pump will begin to produce the 20 strokes and to suck the chemical from the "test-tube".

6) At the end of 20 strokes the pump will stop. Read the value of chemical left into "test-tube".

8) Substract the initial value to the left value.

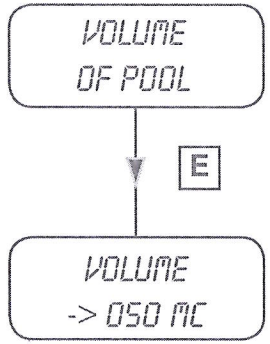
9) Divide the result with the ST value (20).

10) Type this value into "CC/ST" voice located into "OXYGEN PUMP SET " menu.

If obtained result is too small or too big, please, try to change strokes value (20).

14. Volume of pool

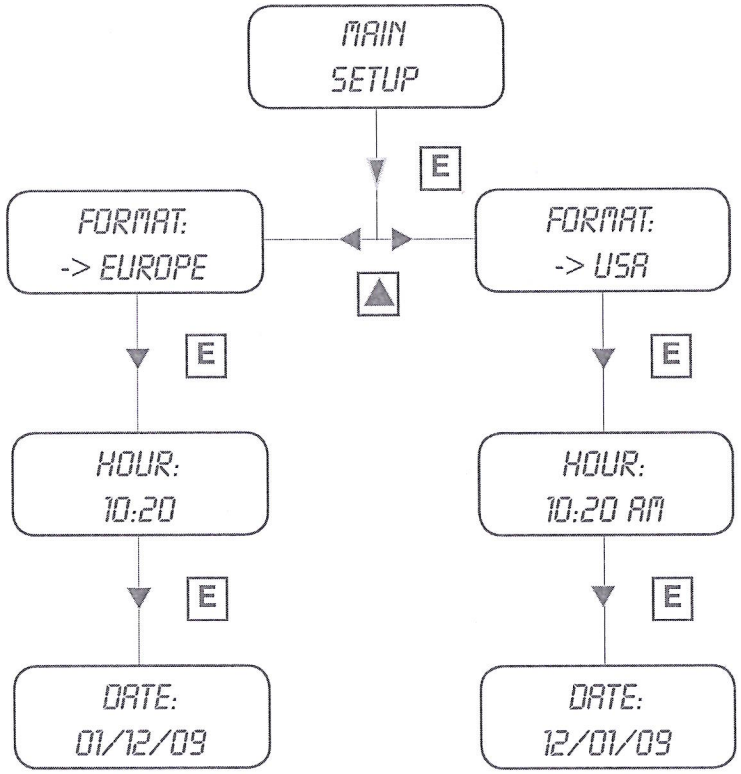
For proper dosing activity set pool dimension within a minimum of 1m³ and a maximum of 199m³.
To change this value use "**UP**" and "**RIGHT**" keys. Press "E" to confirm.



15. Main setup

This menu allows to set units type within IS and USA format and to set current date and time.
Use "UP" key and "RIGHT" key to edit values.

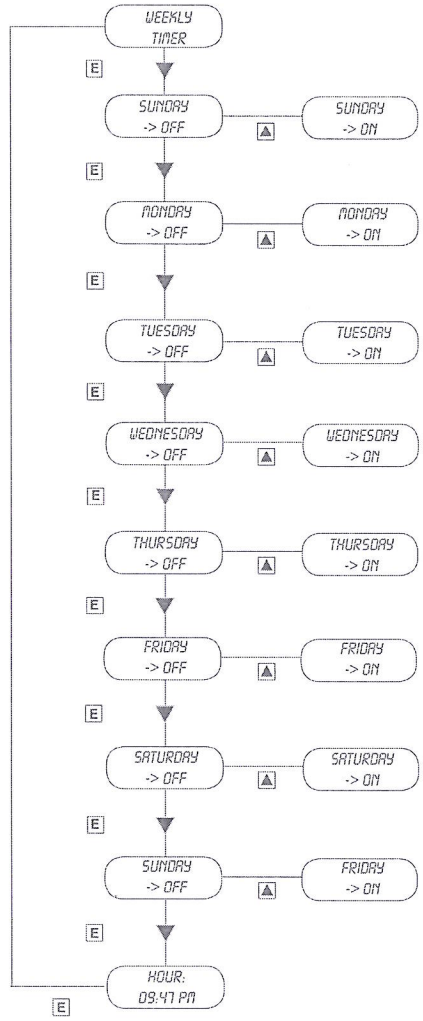
EUROPE IS (International Standard)	USA
Date (DD/MM/YY)	Date (MM/DD/YY)
Temperature °C	Temperature °F
Time format: 24h	Time format: AM / PM



16. Weekly Timer

Use this menu to setup dosing activity on weekly base and starting time. Press "E" key to scroll from MONDAY to SUNDAY and press "UP" key to enable or disable selected day. Furthermore set starting time using "UP" key (choose digit) and "RIGHT" key (next digit).

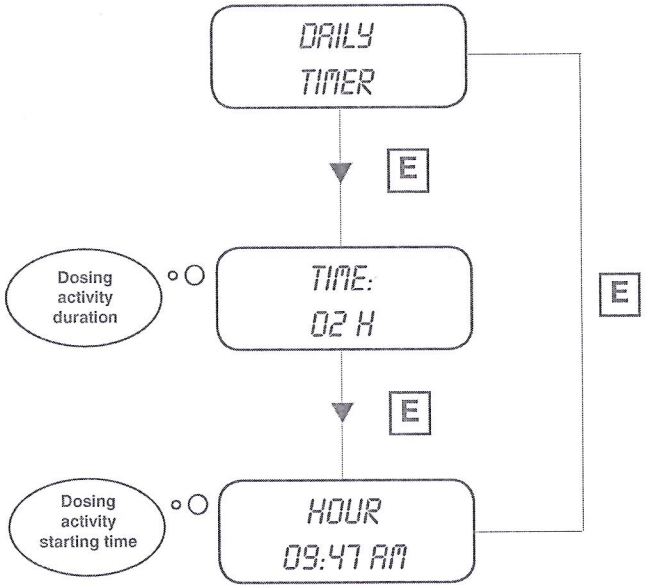
Note: this menu must be activated from "SET MODE" menu to operate.



17. Daily timer

Use this menu to setup dosing activity on daily base, duration and starting time. Press "E" key to scroll, press "UP" (choose digit) and "RIGHT" key (next digit).

Note: this menu must be activated from "SET MODE" menu to operate.



18. Cal. Temperature

Use this function to calibrate the temperature probe.

"R" is the actual reading value from temperature probe
"C" is the temperature referring value. During calibration, "R" value may be different from the real temperature value. Wait a stable reading, dip the probe's tip in the tank.
Use a thermometer and check the temperature in the same point of the probe, edit this value in "C" field (calibration) using "**UP**" and "**DOWN**" keys.

Press "**E**" key to confirm. The pump will confirm the data saving by displaying the message "DATA SAVED".

PROBLEM	POSSIBLE CAUSE
Pump doesn't turn on.	*Pump isn't powered. Connect it to main supply.* *Pump's protection fuse is broken. Replace it. See page 27 for replacement procedure.* *Pump's main board is broken. Replace it. See page 27 for replacement procedure.*
Pump is not dosing and solenoid is operating.	*The foot filter is obstructed. Clean it.* *Suction hose is empty. Pump must be primed. Repeat priming procedure.* *Air bubbles inside hydraulic circuit. Check valves - hoses - fittings.* *Product to dose is generating gas. Turn discharge knob and let air flow away.* *Use a self-venting pump head.*
Pump is not dosing and solenoid isn't operating or slightly operating.	*Crystals presence inside valves. Check them and try to dose 2-3 liters of normal water. Change valves.* *Injection valve obstructed. Change it.*

Fuse or main board replacement is allowed to qualified personnel only. Before to operate disconnect the pump from main power and all hydraulic connections.

For fuse replacement is necessary to use a 3x16 and 3x15 screwdriver and a new fuse (same model of old one).

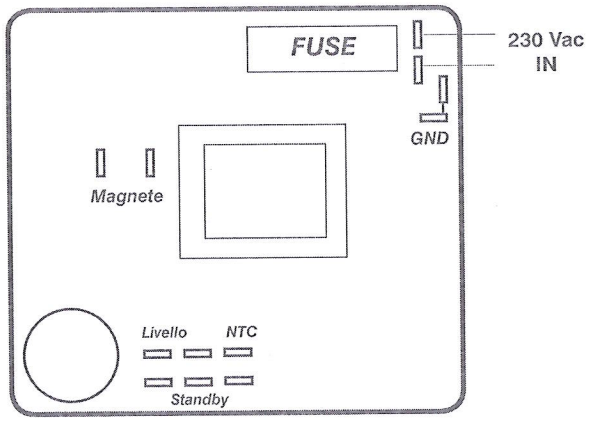
For main board replacement is necessary to use a 3x16 and 3x15 screwdriver and a new main board (same model of old one).

Fuse replacement procedure:

- Remove 6 screws from pump's back.
- Pull pump's back cover until it's completed separated from pump's front.
- Locate the blown fuse and replace it.
- Reassemble the pump.
- Reinsert screws.

Main board replacement procedure:

- Remove 6 screws from pump's back.
- Pull pump's back cover until it's completed separated from pump's front.
- Remove board's screws.
- Completely disconnect wires from main board and replace it. Reinsert screws.
- Reconnect wires to the main board (see enclosed picture).
- Reassemble the pump.
- Reinsert screws.



1: Level probe (+), connect the other wire to ground
2: Temperature probe (+), connect the other wire to ground
3: Stand-By (if any), connect the other wire to ground

During normal operating mode, pump must be checked once for month. Wear needed safety devices and check hoses and all hydraulic components for:

- product leak
- broken hoses
- corroded connections

All maintenance operations must be performed by authorized and trained personnel only. If pump needs assistance please use original package to return it.

Before to do it, please, remove all dosing product inside the pump head and hoses.

Use only original spare parts!

TECHNICAL FEATURES

Pump Strokes:	0 ÷ 150
Suction Height:	1,5 metres
Environment Temperature:	0 ÷ 45°C (32 ÷ 113°F)
Chemical Temperature:	0 ÷ 50°C (32 ÷ 122°F)
Installation Class:	II
Pollution Level:	2
Audible Noise:	74dbA
Packaging and Transporting Temperature:	-10÷+50°C

MANUFACTURING MATERIALS

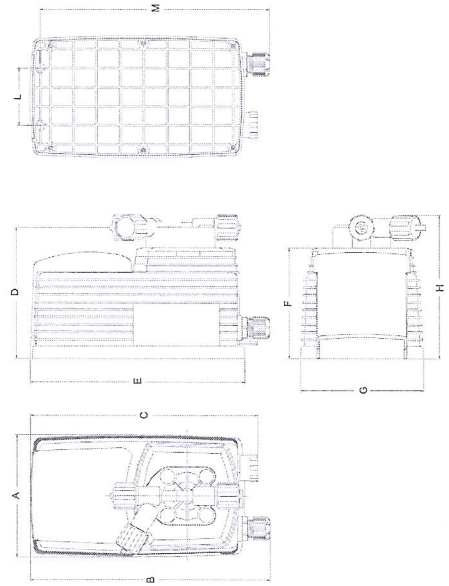
Case:	PP
Pump head:	PVDF
Diaphragm:	PTFE
Balls:	CERAMIC
Suction Pipe	PVC
Delivery Pipe:	PE
Valve Body:	PVDF
O-ring:	FP
Injection connector	PP, PVDF (glass, HASTELLOY C276 spring)
Level Probe:	PP
Level probe cable:	PE
Foot Filter:	PP

Dimensions (mm)

IP65 enclosure (NEMA4x)
"VMS" series metering pumps are manufactured in molded glass and Polypropylene housing to ensure protection against aggressive chemicals and tough environment.

ENVIRONMENT:
-10°C - +45°C (14°F - 113°F)

DIMENSIONS	mm	inches
A	106.96	4.21
B	210.44	8.28
C	199.44	7.85
D	114.50	4.50
E	187.96	7.40
F	97.00	3.81
G	106.96	4.21
H	125.47	4.93
L	50.00	1.96
M	201.00	7.91



Solenoid driven metering pumps are widely used to dose chemical fluids and it is important that the most suitable material in contact with fluid is selected for each application. This compatibility table serves as a useful help in this respect. All the informations in this list are verified periodically and believed to be correct on the date of issuance. All the informations in this list are based on manufacturer's data and its own experience but since the resistance of any material depends by several factors this list is supplied only as an initial guide, in no way EMEC makes warranties of any matter respect to the informations provided in this list.

Product	Formula	Ceram.	PVDF	PP	PVC	SS 316	PMMA	Hastel.	PTFE	FPM	EPDM	NBR	PE
Acetic Acid, Max 75%	CH3COOH	2	1	1	1	1	3	1	1	3	1	3	1
Hydrochloric Acid, Concentrate	HCl	1	1	1	1	3	1	1	1	1	3	3	1
Hydrofluoric Acid 40%	H2F2	3	1	1	2	3	3	2	1	1	3	3	1
Phosphoric Acid, 50%	H3PO4	1	1	1	1	2	1	1	1	1	1	3	1
Nitric Acid, 65%	HNO3	1	1	2	3	2	3	1	1	1	3	3	2
Sulphuric Acid, 85%	H2SO4	1	1	1	1	2	3	1	1	1	3	3	1
Sulphuric Acid, 98.5%	H2SO4	1	1	3	3	3	3	1	1	1	3	3	3
Amines	R-NH2	1	2	1	3	1	-	1	1	3	3	1	1
Sodium Bisulphite	NaHSO3	1	1	1	1	2	1	1	1	1	1	1	1
Sodium Carbonate (Soda)	Na2CO3	2	1	1	1	1	1	1	1	2	1	1	1
Ferric Chloride	FeCl3	1	1	1	1	3	1	1	1	1	1	1	1
Calcium Hydroxide (Slaked Lime)	Ca(OH)2	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Hydroxide (Caustic Soda)	NaOH	2	1	1	1	1	1	1	1	2	1	2	1
Calcium Hypochlor.(Chlor.ted Lime)	Ca(OCl)2	1	1	1	1	3	1	1	1	1	1	3	1
Sodium Hypochlorite, 12.5%	NaOCl + NaCl	1	1	2	1	3	1	1	1	1	1	2	2
Potassium Permanganate, 10%	KMnO4	1	1	1	1	1	1	1	1	1	1	3	1
Hydrogen Peroxide, 30% (Perydrol)	H2O2	1	1	1	1	1	3	1	1	1	3	3	1
Aluminium Sulphate	Al2(SO4)3	1	1	1	1	1	1	1	1	1	1	1	1
Copper-II-Sulphate (Roman Vitriol)	CuSO4	1	1	1	1	1	1	1	1	1	1	1	1

Resistance rating	1
Resistant	2
Fairly resistant	3
Not resistant	

MATERIALS

Polyvinyldene fluoride	*PVDF*	*Pump Heads, valves, fitting, tubing*
Polypropylene	*PP*	*Pump Heads, valves, fitting, level floater*
PVC	*PVC*	*Pump Heads*
Stainless steel	*SS 316*	*Pump Heads, valves*
Polymethyl Metacr.(Acrylic)	*PMMA*	*Pump Heads*
Hastelloy	*C-276*	*Injection valve spring*
Polytetrafluoroethylene	*PTFE*	*Diaphragm*
Fluorocarbon (Viton® B)	*FPM*	*Sealings*
Ethylene propylene	*EPDM*	*Sealings*
Nitrile	*NBR*	*Sealings*
Polyethylene	*PE*	*Tubing*

way using selected hoses according to pump's capacity / model. Information
for standard use only. For extended information ask to hose's manufacturer.

Suction / Delivery Hose			
4x6 mm PVC (transparent)	4x8 mm PE (opaque)	6x8 mm PE (opaque)	8x12 mm PVC (transparent)

Delivery Hose	Working Pressure				Breaking Pressure			
4x6 mm PE 230 (opaque)	20°C 12 bar	30°C 10.5 bar	40°C 8.5 bar	50°C 6.2 bar	20°C 36 bar	30°C 31.5 bar	40°C 25.5 bar	50°C 18.5 bar
4x8 mm PE 230 (opaque)	20°C 19 bar	30°C 15.7 bar	40°C 12 bar	50°C 7.5 bar	20°C 57 bar	30°C 47 bar	40°C 36 bar	50°C 22.5 bar
6x8 mm PE 230 (opaque)	20°C 8.6 bar	30°C 6.8 bar	40°C 4.8 bar	50°C 2.3 bar	20°C 26 bar	30°C 20.5 bar	40°C 14.5 bar	50°C 7 bar
8x12 mm PE 230 (opaque)	20°C 12 bar	30°C 10.5 bar	40°C 8.5 bar	50°C 6.2 bar	20°C 36 bar	30°C 31.5 bar	40°C 25.5 bar	50°C 18.5 bar
4x6 mm PVDF Flex 2800 (opaque)	20°C 40 bar	30°C 34 bar	40°C 30 bar	50°C 27 bar	60°C 24.8 bar	80°C 20 bar	90°C 10 bar	
6x8 mm PVDF Flex 2800 (opaque)	20°C 29 bar	30°C 25.5 bar	40°C 22 bar	50°C 20 bar	60°C 18 bar	80°C 14.5 bar	90°C 7.3 bar	
8X10 mm PVDF Flex 2800 (opaque)	20°C 18 bar	30°C 15.5 bar	40°C 13.5 bar	50°C 12.5 bar	60°C 11.2 bar	80°C 9 bar	90°C 4.5 bar	
¼ PE 230 (opaque)	20°C 17.6 bar							
⅜ PE 230 (opaque)	20°C 10.6 bar							
½ PE 230 (opaque)	20°C 10.6 bar							

Summary