ETATRON D.S.

POMPE DOSATRICI SERIE BT-BTB PH-RX-CL/M

NORME DI INSTALLAZIONE, USO E MANUTENZIONE

BT-BTB PH-RX-CL/M SERIES METERING PUMPS

OPERATING INSTRUCTIONS AND MAINTENANCE

ITALIANO

ENGLISH

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ETATRON D.S.

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ENGLISH

SYMBOLS

Before a very important notes regarding health protection for the exposed personnel or regarding the machine itself

WARNING

Before safety information, it highlights an operation not to be performed.

FORBIDDEN

Before information regarding equipment use.

INFORMATION

1.0 – GENERAL REGULATIONS

1.1 - WARNINGS

Carefully read the warnings listed below as they contain important information regarding safety during installation, use and maintenance.

- Keep this manual in a safe place for further consultation.
- This equipment complies with the 89/336/EEC directive regarding "electromagnetic compatibility", with the 73/23/EEC "low voltage directive" and with the subsequent modification Nr. 93/68/EEC.

NB: The pump is manufactured to high working standards. Its working life will be longer and its mechanical/electrical reliability will be more efficient if used correctly and if subject to regular maintenance.

WARNING: Any internal repairs or operations to the equipment must be carried out by qualified and authorized personnel. The manufacturer declines all responsibility whatsoever due to non observance of these regulations.

GUARANTEE: 2 years (normal wear on parts is excluded, i.e.: valves, fittings, piping ring-nuts, piping, filter and injection valve). Improper equipment use invalidates the guarantee. The guarantee is intended ex works or at an authorized distributor.

1.2 – SHIPPING AND HANDLING

Shipping must be performed in the same orientation as indicated on the packaging. Shipping using any means, even if delivered free to the customer, is considered at the purchaser's risk. Reclaims for missing material must be made within 10 days from goods receipt. Reclaims for defective material must be made within 30 days from goods receipt. Restitution of pumps must be agreed beforehand with authorized personnel or with the authorized distributor.

1.3 - PROPER USE OF THE PUMP

The pump must only be used for the purpose which it was expressively manufactured, i.e. to dose liquids. Any other use is considered improper and therefore dangerous. The pump is not foreseen for use in any applications not taken into consideration during the design stage. For further clarifications the customer must contact our offices where he will receive information about the type of pump in his possession and its correct use. The manufacturer cannot be considered responsible for any damage derived from improper, erroneous and unreasonable use.

1.4 - RISKS

- After removing the packaging, check the pump for any damage. If in doubt do not use the pump and contact qualified personnel. All packaging elements (such as plastic bags, polystyrene, etc.) must be kept out of the reach of children as the material is potentially dangerous.
- Before connecting the pump, check that the data on the nameplate corresponds to the local voltage ratings. The data is available on the adhesive nameplate on the pump
- The electrical plant must comply with any local regulations in the country where the pump is installed.
- Observe some fundamental rules when using any type of electrical equipment, in particular:
- Do not touch the equipment with wet or damp hands or feet;
- Do not operate the pump without shoes (e.g. swimming pools)
- Do not leave the pump exposed to atmospheric agents (rain, sun, etc.)
- Do not allow the pump to be used by children or unskilled individuals without supervision.
- In case of faults and/or bad pump operation, turn off the pump and do not tamper. For any necessary repairs contact our specialized technical assistance centres and insist on the use of original spare parts. Any lack of respect to the above may compromise pump safety.
- If the user decides to make no further use of an installed pump, it is recommended to render the pump inoperative and disconnect if from the power supply.

Before performing any maintenance or cleaning operations on the dosing pump, proceed as follows:

1. Make sure the pump is electrically deactivated (both poles) by disconnecting the conductors from the power supply using the omnipolar switch which must have a minimum distance of 3 mm between its contacts (Fig. 4).
2. Relieve all the pressure in the pump body and the outlet piping in the most adequate way possible (be very careful during this operation).
3. Drain the liquid present in the pump body by disassembling and reassembling the pump body using the four fixing screws (Fig. 10).

If any liquid losses are present in the hydraulic system (due to O-ring seals, valves or piping breakages), stop the pump by releasing pressure in the outlet piping and then proceed with maintenance operations using adequate safety measures (gloves, goggles, overalls, etc.).

1.5 – DANGEROUS AND/OR TOXIC LIQUID DOSAGE

To avoid damage to persons and property due to contact with dangerous liquids or by the inhalation of toxic vapours, always adhere to the instructions contained in this booklet and keep in mind the following regulations:

- Perform operations according to the instructions of the liquid manufacturer.
- Check the hydraulic parts of the pump for damage and breakages and only use the pump if it is in perfect working order.
- Use small piping fit for the liquid being used and for the plant operating conditions, if necessary, insert the piping inside PVC protection conduit.
- Before deactivating the dosing pump, neutralize the hydraulic part using an appropriate reagent.

1.6 – ASSEMBLING AND DISMANTLING THE PUMP

1.6.1 - ASSEMBLY

All the pumps we produce are normally supplied fully assembled. For better clarification, consult the appendix at the end of this manual where exploded assembly drawings and views of the pumps are available together with all components and their nomenclature, for the user to have complete details of the pump components. These drawings are indispensable when searching for malfunctioning or defective parts. Other drawings refer to hydraulic parts (pump header and valves) and are shown for the same reasons in the appendix at the end of the booklet.

1.6.2 - DISMANTLEMENT

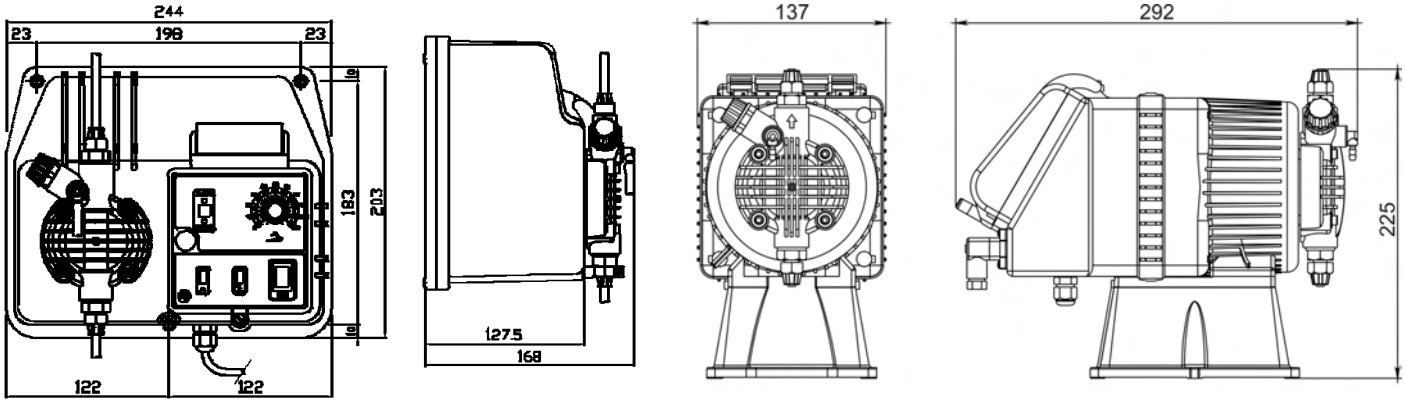
To dismantle the pump or before performing pump maintenance, proceed as follows:

1. Make sure the pump is electrically deactivated (both poles) by disconnecting the conductors from the power supply using the omnipolar switch which must have a minimum distance of 3 mm between its contacts (Fig. 4).
2. Relieve the pressure in the pump body and the outlet piping in the most adequate way possible (be very careful during this operation).
3. Drain the liquid present in the pump body by disassembling and reassembling the pump body using the four fixing screws, tightening torque 180÷200 Nxcm (Fig. 10).

Please pay particular attention to this last point and we recommend the user to consult the enclosed drawings and chapter 1.4 “RISKS” before starting any operations.

VIEWS AND DIMENSIONS

(Fig.1)



2.0 – BTB MA/AD SERIES ANALOGICAL DOSING PUMPS

2.1 – OPERATING PRINCIPLES

Dosing pump operation is ensured by a PTFE (teflon®) membrane mounted on the piston of an electromagnet. When the piston of the electromagnet is attracted, pressure is produced in the pump body and liquid is ejected from the outlet valve. Once the electrical impulse has terminated a spring brings the piston back to its original position and liquid is called in through the suction valve. Due to this simple operation of the pump, no lubrication is needed and maintenance is reduced to nearly zero. The materials used to manufacture the pump make it fit for use even with particularly aggressive liquids. The dosing pump has been designed for flow rates starting from 0 to 80 l/h and pressures from 0 to 15 bars (depending on pump type).

2.2 – TECHNICAL CHARACTERISTICS

•	Equipment manufactured according to regulations CE
•	Fireproof antiacid plastic casing
•	Control panel protection assured by a transparent policarbonate cover with gasket
•	Standard power supply (maximum fluctuations of ± 10% are allowed). 230 Vac 50-60 Hz single-phase
•	Optional power supply (maximum fluctuations of ± 10% are allowed): 120 Vac 50-60 Hz single-phase
•	Environmental conditions: closed environment, IP65 protection level, altitude up to 2000 m, ambient temperature from 5°C to 40°C, maximum relative humidity 80% up to a maximum of 31°C (linear decrease down to 50% at 40°C)
•	Classification with respect to protection against indirect contacts: CLASS I (the equipment is supplied with a protection conductor)

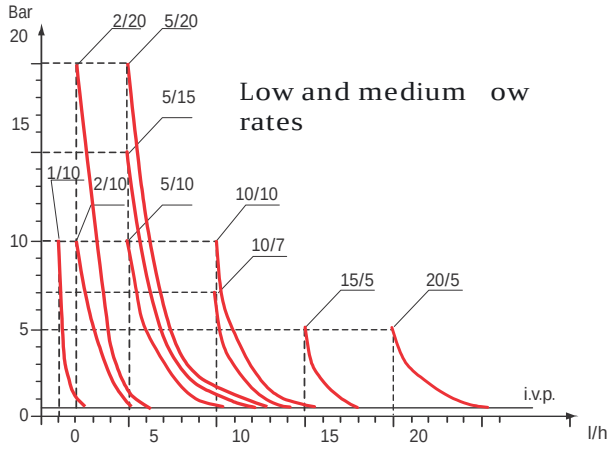
2.3 – MATERIAL IN CONTACT WITH THE ADDITIVE

1	DIAPHRAGM: PTFE
2	PUMP BODY: polypropylene; optional PVC, stainless steel 316; PTFE, PVDF
3	FITTINGS: Polypropylene
4	FILTER: Polypropylene
5	INJECTION FITTING: Polypropylene
6	SUCTION PIPING: Flexible crystal PVC
7	OUTLET PIPING: Polyethylene
8	Standard LIP VALVE: FPM, (available in silicon, EPDM and NBR) as an optional: BALL VALVE (Stainless steel, PYREX glass with or without return spring) KALREZ VALVE
9	GASKETS: FPM, optional EPDM, NBR, Silicon, PTFE (only for ball valves)

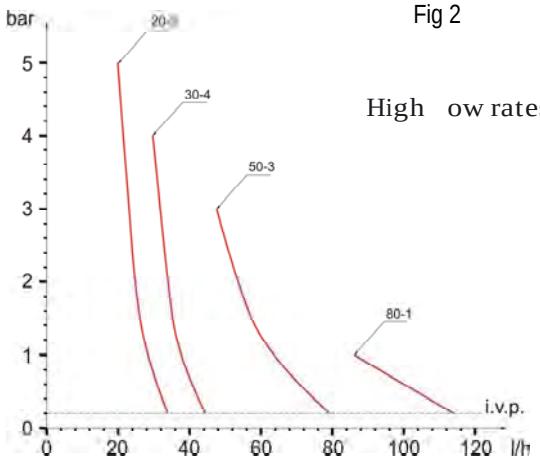
BT

Type	Max.Flow rate	Max. Pressure	Max. Pulses/min	Dosage per pulse	Stroke	Suction height	Standard power supply	Power absorbed	Current absorbed	Net weight
	l/h	bar		ml	mm	m	Volts/Hz	Watts	Ampere	Kg
1-10	1	10	100	0.16	0.8	1.5	230 V 50 - 60 Hz	40	0.18	4.2
*2-10	2	10	160	0.21	0.8	2.0	230 V 50 - 60 Hz	40	0.18	4.2
2-20	2	20	160	0.21	1.1	2.0	230 V 50 - 60 Hz	60	0.26	4.2
3-10	3	10	160	0.31	0.8	2.0	230 V 50 - 60 Hz	60	0.26	4.2
*5-10	5	10	160	0.52	1.0	2.0	230 V 50 - 60 Hz	60	0.26	4.2
*5-15	5	15	160	0.52	1.8	2.0	230 V 50 - 60 Hz	93	0.39	4.7
5-20	5	20	160	0.52	1.5	2.0	230 V 50 - 60 Hz	115	0.48	5.2
*10-7	10	5	160	1.04	1.4	2.0	230 V 50 - 60 Hz	60	0.26	4.2
*10-10	10	10	160	1.04	1.1	2.0	230 V 50 - 60 Hz	93	0.39	4.7
*15-5	15	5	160	1.56	2.2	2.0	230 V 50 - 60 Hz	111	0.48	5.2
20-5	20	5	160	2.08	2.2	2.0	230 V 50 - 60 Hz	111	0.48	5.2
30-4	30	4	180	2.80	1.4	1.5	230 V 50 - 60 Hz	124	0.54	5.7
50-3	50	3	180	4.60	1.7	1.5	230 V 50 - 60 Hz	124	0.54	5.7
80-1	80	1	180	7.40	2.4	1.5	230 V 50 - 60 Hz	124	0.54	5.7

Fig 2



Low and medium ow rates



High ow rates

Fig. 3

BTB

Type	Max.Flow rate	Max. Pressure	Max. Pulses/min	Dosage per pulse	Stroke	Suction height	Standard power supply	Power absorbed	Current absorbed	Net weight
	l/h	bar		ml	mm	m	Volts/Hz	Watts	Ampere	Kg
*2-10	2	10	120	0.28	0.8	2.0	230 V 50 - 60 Hz	35	0.18	3.4
2-20	2	20	120	0.28	1.1	2.0	230 V 50 - 60 Hz	67	0.26	4.4
*3-10	3	10	120	0.42	0.8	2.0	230 V 50 - 60 Hz	35	0.26	3.4
4-20	4	20	120	0.56	1.5	2.0	230 V 50 - 60 Hz	67	0.26	5.4
* 5-7	5	7	120	0.69	0.7	2.0	230 V 50 - 60 Hz	35	0.26	3.4
*5-10	5	10	120	0.69	0.7	2.0	230 V 50 - 60 Hz	55	0.26	4.4
*10-7	10	7	120	1.39	1.4	2.0	230 V 50 - 60 Hz	67	0.39	4.4
*10-10	10	10	120	1.39	1.4	2.0	230 V 50 - 60 Hz	67	0.39	5.2
*15-5	15	5	120	2.08	2.2	2.0	230 V 50 - 60 Hz	67	0.48	5.2
20-5	20	5	120	2.78	2.2	2.0	230 V 50 - 60 Hz	67	0.48	5.2

Fig 2

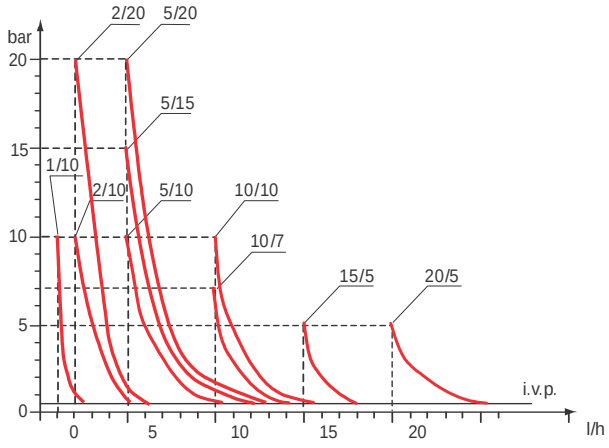


Fig. 3

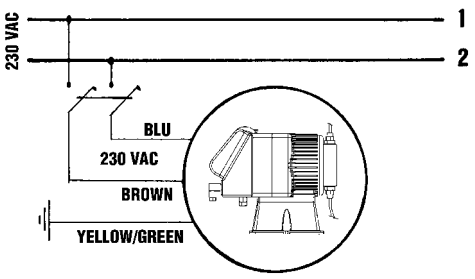
The diagrams (fig. 3) show the variation in maximum flow rate of the dosing pumps when the pressure in the plant being treated changes. The load losses in the plant due to the I.V.P. injection valve are also taken into account. Due to production needs, the technical characteristics of our equipment may vary within a tolerance of 5%. This must be considered when choosing the type of pump to be employed.

3.0 - INSTALLATION

a. Install the pump away from heat sources, in a dry place and at a maximum ambient temperature of 40°C. The minimum operating temperature of the pump depends on the liquid to be dosed, as the liquid must remain in a fluid state. If the pump has been stored at an ambient temperature of less than 0°C, make sure that any water present in the pump body is in a liquid state before starting up the pump.

b. Carefully observe the regulations in force for the electrical plant in the country where the pump is installed (Fig. 4).

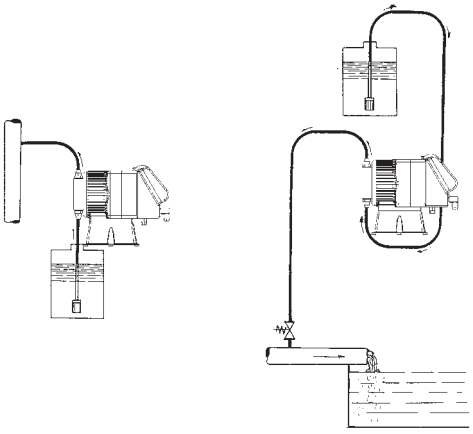
If the power cable has no plug, the equipment must be connected to the power supply using an omnipolar switch with a minimum distance of mm. 3 between the contacts. Before accessing the power connection devices, all power circuits must be interrupted.



Pay attention to the Yellow/Green Earth protection conductor ⏚
It must be connected to the power supply earth protection conductor.

Fig. 4

c Locate the pump in position as shown in fig. 5 taking into account that it can be located over or under the liquid level within a maximum difference of 2 meters. The injection point must always be located higher than the liquid being injected. Do not install the pump directly on the tank as some additives produce vapour which may damage the equipment. For correct installation see fig.12. If the plant being treated operates at atmospheric pressure (free discharge additive) and the additive tank must be placed higher than the injection point (Fig. 6), check periodically that the injection valve is operating correctly, as excessive wear could cause additive injection by liquid loss (even when the plant is not operating). If the problem persists, insert a correctly calibrated counter pressure valve C between the dosing pump and the injection point (Fig. 6). For liquids that give off aggressive exhalations, do not install the pump over the tank unless the tank is hermetically sealed.



d. The outlet fitting must always be on the upper part of the pump, from which the piping to the plant being treated will be connected. Consequently, the suction fitting will always be on the lower part of the pump, where the piping and filter to the liquid container will be mounted.

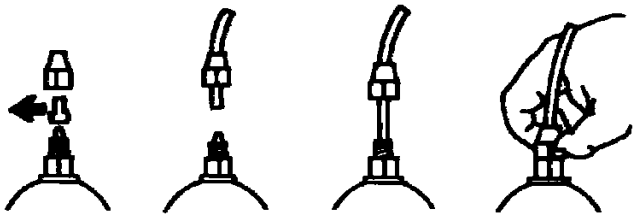


Fig. 7

e. Slide out the two red protection capsules from the fittings; insert the piping all the way onto the conical attachments and lock them using the fixing rings (Fig. 7).

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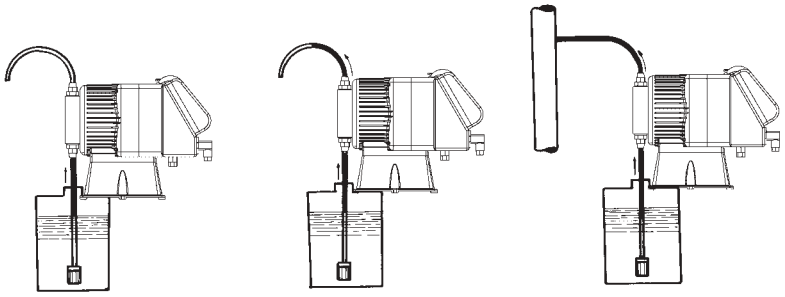


Fig. 8

If the pump has to be removed from the plant for any reason whatsoever, it is recommended to reuse the protection capsules to avoid liquid loss from the pump body.

f. Priming the pump: if the pump is supplied with a discharge valve, connect the outlet piping and follow the sequence shown in fig.8.

8 A – Unscrew the discharge tap knob.

8 B – With the pump operating, keep open the discharge valve B until all the air in the piping and the pump body is expelled.

8 C – Close the discharge tap.

If priming the pump becomes difficult extract air from the discharge fitting using a syringe and decrease the number of pulsations, if the pump does not have a discharge valve extract air from the outlet fitting using a standard syringe with the pump in motion until liquid can be seen in the syringe or in the suction piping. To connect the fitting to the syringe, use a piece of suction piping.

g. Avoid all unnecessary bends on the outlet and suction piping.

h. Select the most appropriate injection point on a pipe of the plant to be treated and fit a steel 3/8" female gas connector. This connector is not supplied with the pump. Screw the injection valve to the gas connector, using Teflon® tape as a gasket as shown in Fig. 9. Connect the discharge piping to the conical connector on the injection valve and lock it with the ring-nut G. The injection valve also acts as a non-return valve.

NB. The seal ring D must not be removed.

3.1 – INJECTION VALVE ASSEMBLY DIAGRAM

(fig.9)	
A	Plant being treated
C	Injection valve
M	Conical fitting for piping
N	3/8" gas female fitting
G	Piping docking ring-nut
T	Polyethylene piping
D	Seal ring

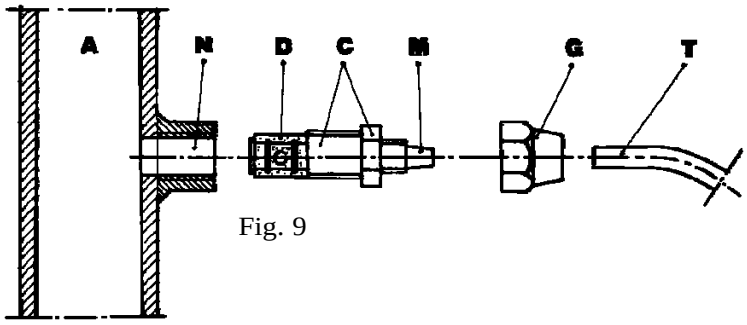


Fig. 9

4.0 - MAINTENANCE

1. Periodically check the liquid level in the tank to make sure that the pump does not run dry; even though no damage will occur to the equipment itself, this is recommended to avoid any damages due to the lack of additive in the plant.
2. Check pump operation, screw seals and gaskets every 6 months and for very aggressive liquids make more frequent checks and in particular monitor the concentration of the plant additive; a reduction in additive concentration could be determined by wear on the valves (in this case substitute the valves being careful to reassemble them as in Fig. 10) or by clogging of the filter which must be cleaned as follows.
3. The manufacturer recommends periodical cleaning of the hydraulic parts (valves and filters). It is not possible to establish a cleaning frequency as this depends on the type of application; the reagent to be used depends on the additive employed.

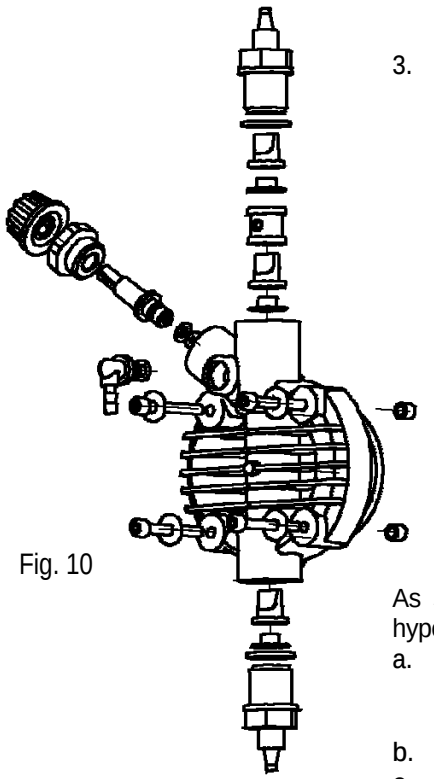


Fig. 10

WARNING: to tighten the four screws use a Dynamometer screwdriver set to a tightening torque of 180÷200 Nxcm.

As stated above, we can suggest how to intervene if the pump is operating with sodium hypochlorite (most frequent case):

a. Make sure the pump is electrically deactivated (both poles) by disconnecting the conductors from the power supply using the omnipolar switch which must have a minimum distance of 3 mm between its contacts.
b. Disconnect the plant outlet piping
c. Remove the suction piping (with filter) from the tank and place it in clean water
d. Start the dosing pump and leave it operating with water for about 5-10 minutes
e. With the pump disconnected, place the filter into a hydrochloric acid solution and wait until the acid solution terminates its cleaning effect
f. Start the pump again making it operate with the hydrochloric acid solution for 5 minutes in a closed circuit situation, with the suction and outlet immersed in the same container
g. Repeat the operation using water
h. Reconnect the dosing pump to the plant.

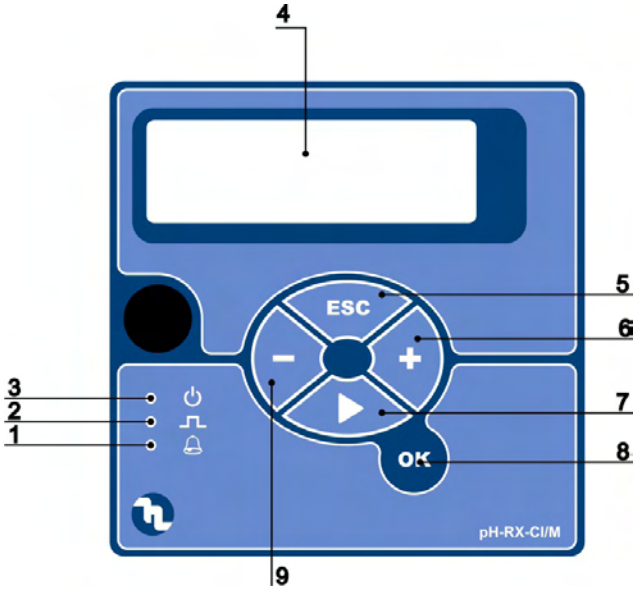
5.0 – REGULATIONS FOR SULPHURIC ACID ADDITIVE (MAX 50%)

In this case it is necessary to take into account the following:

1. Substitute the flexible crystal PVC suction piping with semi-rigid polyethylene piping.
2. Remove all water present in the pump body (**if water mixes with sulphuric acid a great amount of gas is generated which will overheat the area and cause damage to the valves and pump body**).

To perform this operation when the equipment is not fixed to the plant, the pump can be pulsed for a few seconds (15-30) keeping it overturned and without piping connected to the fittings. If this is not possible disassemble and reassemble the pump body (Fig. 10), using the four fixing screws.

6.0 – MANUAL DOSING PUMP



Manual flow rate adjustment using a potentiometer to intervene on the injection frequency.

6.1 - COMMANDS (Fig. 11)

1		Alarm LED "yellow"
2		Pulse LED "red"
3		Power on LED "green"
4		LCD display
5	ESC	Exit functions Button
6	+	Increase value button
7	▶	Cursor movement
8	OK	Confirm button
9	–	Decrease value button

6.2 – TYPICAL PLANT DIAGRAM

[fig.12]	
A	Injection valve
B	Power supply
C	Filter
D	Floating level switch
G	Level switch connector
H	Cable gland
S	Process tank

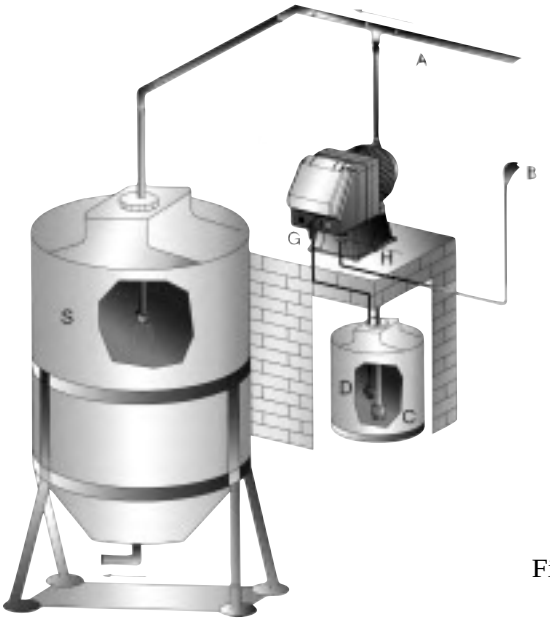


Fig. 12

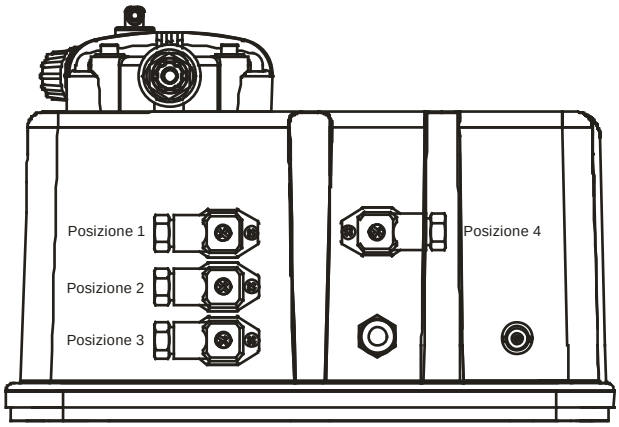
6.3 – ADDITIONAL COMPONENTS SUPPLIED

•	n. 1 flexible transparent crystal suction piping in PVC, length 2 m;
•	n. 1 polyethylene polypropylene semi-rigid white outlet piping, length 2 m;
•	n. 1 3/8" BSP injection valve
•	n. 1 bottom filter;
•	n. 1 set of instructions

6.4 – LEVEL ALARM (fig. 13)

The dosing pump has a connector to be able to connect a level sensor (optional). When the level of the dosing product inside the tank is too low the level contact closes and after 5 seconds the dosing pump goes into an alarm state, then the electromagnet stops.

7.0 - SERVICE CONNECTOR WIRING DIAGRAMS AND FUNCTIONS



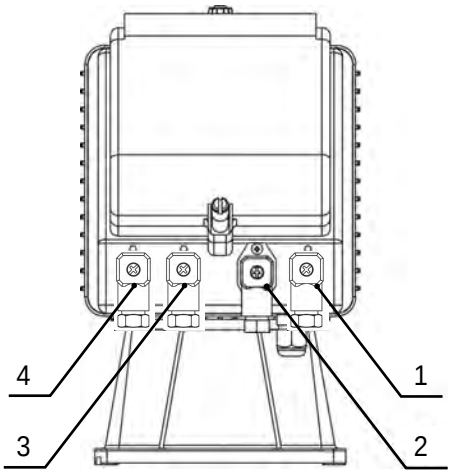
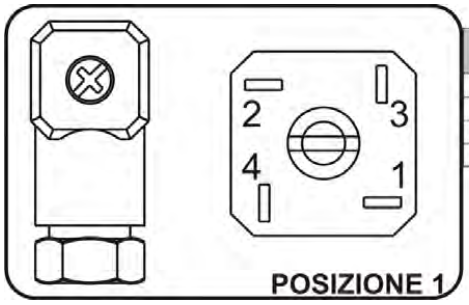
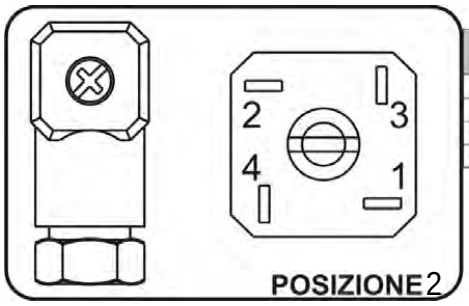


Fig 13



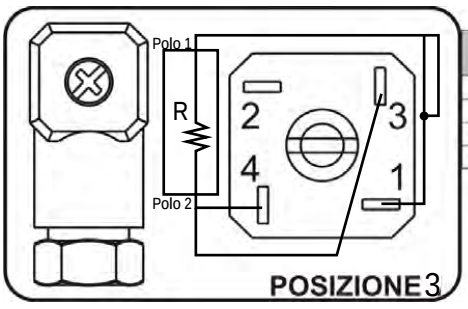
REALY OUTPUT

Pin 1	Normally open (N.O.)
Pin 2	Normally closed (N.C.)
Pin 3	Common
Pin 4	No connection



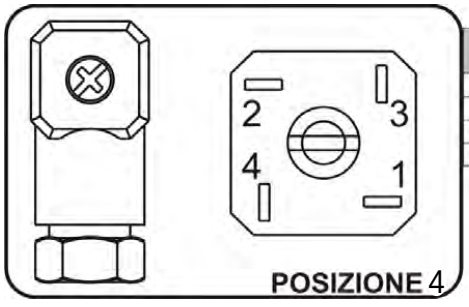
LEVEL PROBE/FLOW SENS. +mA

Pin 1	(+) Red wire mA output
Pin 2	(-) Black wire mA output
Pin 3	Level probe wire/flow sens.
Pin 4	Level probe wire/flow sens. (+)



TEMPERATURE PROBE

Pin 1	Pole 1 of PT100
Pin 2	No connection
Pin 3	Pole 2 of PT100
Pin 4	Pole 2 of PT100 (*)



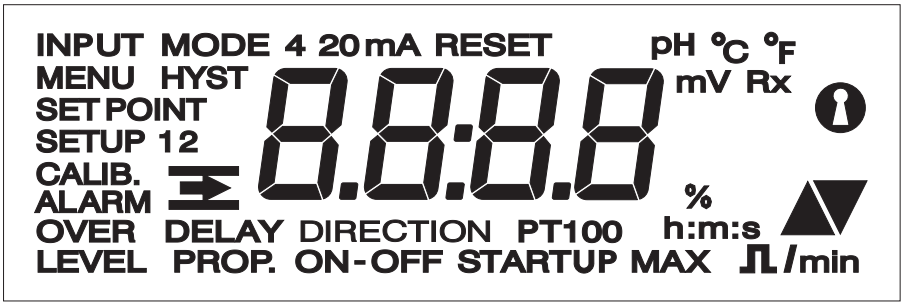
CHLORINE PROBE

Pin 1	(+5V) Probe
Pin 2	No connection
Pin 3	No connection
Pin 4	(-5V) Probe

N.B.: in the MB version (dosing pump with basic function) are not present the following service outputs:
- Relay output
- PT100 temperature sensor

(*): Warning, shield must not be connected

8.0 - DISPLAY DESCRIPTION



OVER	Overdosing alarm
DELAY	Delay at powering on
SET POINT	Setpoint setting
LEVEL	Level alarm
ALARM	Alarms setting
MENU	Menu selection
ON-OFF	ON-OFF functioning mode
PROP.	Proportional functioning mode
PT100	Temperature probe
HYST	Hysteresis setting
12	Calibration points
CALIB.	Calibration menu
SETUP	General instrument settings
STARTUP	Switching-on delay settings
INPUT MODE	Level probe/flow sensor input activation
RESET	Reset activation
DIRECTION	Intervention selection
MAX	Maximum pulses frequency based to maximum measuring value
4 20 mA	Output current settings
h:m:s	Hours:minutes:seconds
°C	Temperature measurement unit in Celsius
°F	Temperature measurement unit in Fahrenheit
%	Flow rate percentage
mV Rx	mV measure
pH	pH measure
Cl ppm	ppm Cl measure

	Password setting
	Intervention Alkaline/Oxidant/Direct
	Intervention Acid/Reductive/Inverse
/min	pulses/minute
	Flow sensor
8.8:8.8	numeric values visualization

8.1 - PARAMETERS AND FUNCTIONS LAYOUT (Factory default - pH)

FUNCTIONS	*DEFAULT*
Setpoint setting	***7,2***
Hysteresis setting	***0,1***
Choice of the type of intervention	***Acid***
Manual or proportional intervention selection	***Manual***
Definition of beginning intervention value "AUTO"	***Setpoint + 1pH***
First point of calibration procedure	***-------***
Second point of calibration procedure	***-------***
Minimum alarm point	***0,00***
Maximum alarm point	***14,00***
Over-dosing alarm value	***99:59 h:m***
Choice of the type of menu: BASIC and FULL (expert user)	***BASIC***
Selection measures to control (pH, RX or Chlorine)	***pH***
Six figures numerical password	***Disable***
Chosen thermal selection (°C or °F)	***°C***
Temperature compensation selection (manual - auto)	***Manual - 25°C***
Delay at powering on	***00:03 m:s***
Delay exit calibration menu	***05:00 m:s***
Calibration check 4 mA	***4 mA***
Calibration check 20 mA	***20 mA***

8.2 - TYPICAL CHARACTERISTICS

PARAMETER	*VALUE*
Temperature	*0÷40°C*
Max current relay output	*6A (resistive load) 1A (inductive load)*
Current output	*4 - 20 mA (dynamic 0...500 ohm)*
pH measure	*0÷14 (0,01 pH)*
RX (mV) measure	*-1000 ÷ +1400 (±1 mV)*
Chlorine measure	*0÷2; 0÷20; 0÷200; 0÷2000 (0,1 ppm)*
Temperature measure PT100	*0÷100°C (0,1°C)*

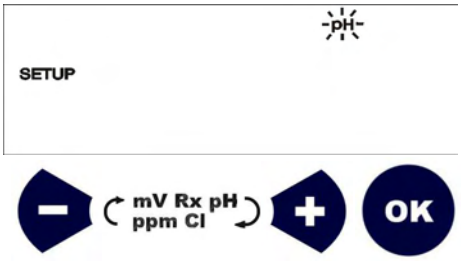
9.0 - PROGRAMMING

Through the front panel it is possible to set and to modify all the working parameters of operating setting of the pump.

9.1 - PUMP SETUP

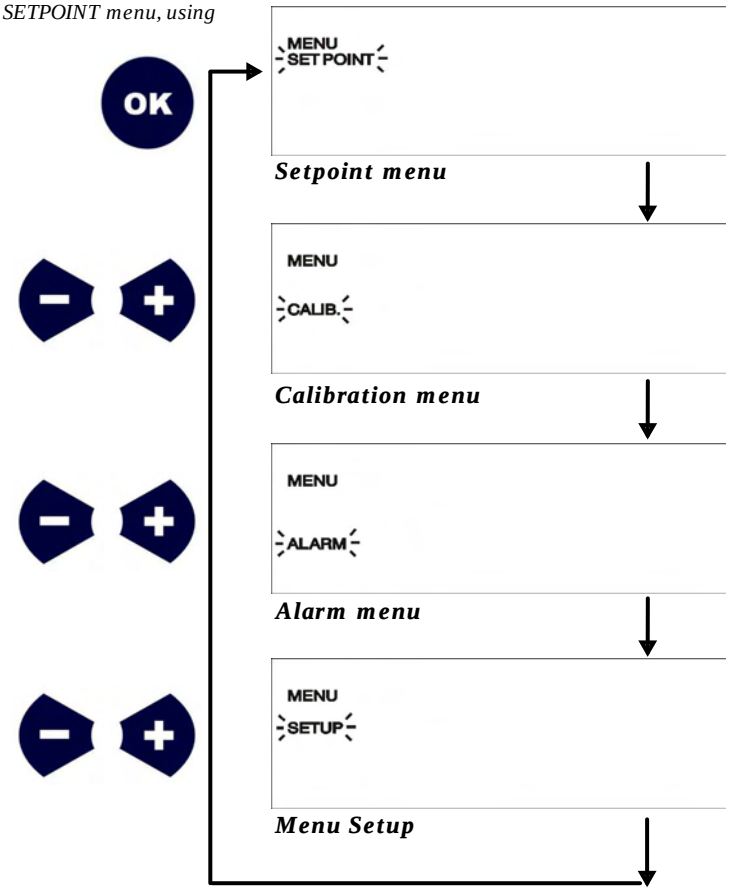
The first operation to do is to select the type of parameter (pH, Redox or free Chlorine) that is intends to measure and to control.

The pump has turned on, on display it appear software revision then the type of controlled parameter that it flashes (default settings: pH - menu BASE).
In this phase it is possible to set measure type by means on the ***+*** *and* ***-*** *buttons and to confirm through the* ***OK*** *button.*



After confirm with the ***OK*** *button the measure's type, the pump goes in measure mode, on display will show the measure's value.*

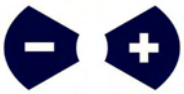
Press ***OK*** *button to enter in menus; the first is SETPOINT menu, using* ***+*** *and* ***-*** *buttons you will scroll all 4 menus.*



*To enter in SETUP menu scroll all menus with + and - buttons up to reach the desired menu (on display will show SETUP), press **OK** to confirm.*

On display will appear the last setting previously selected; in case of a new product, the pump has by default BASE (simplified menu), to select the type of parameter to control it is necessary to pass in FULL menu (complete menu - expert users).

*To shift from BASE to FULL modes and vice versa, press **+** and **-** buttons.*

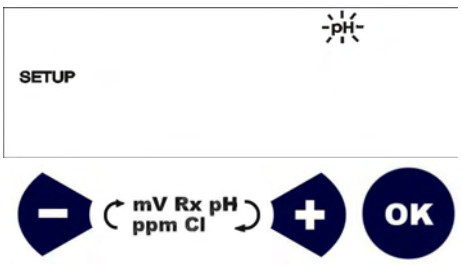


*When FULL appears on the display press **OK** to confirm.*

After around 2 seconds the selection is acquired by the pump and the operator can decide whether to quit SETUP menu or to continue for additional setting. In the view of selecting pH, Redox or Free Chlorine measuring, check next paragraph.

9.1.1 - Measure type selection

*Once pressed **OK** the pump goes in SETUP mode. In this mode is possible to select the type of control (measure) that it want to effect. This mode is a loop among pH, Redox and ppm; as default pH will flash. Acting on **+** and **-** buttons, user can select among 3 possibilities, (pH, RX mV, ppm Cl). Pressing the button **OK** is confirmed the selected choice. The pump will enter in Password menu.*



9.1.2 - Password

As default, protection password is disabled. It is possible for the user to set a protection password of the device during the definition of Setup.

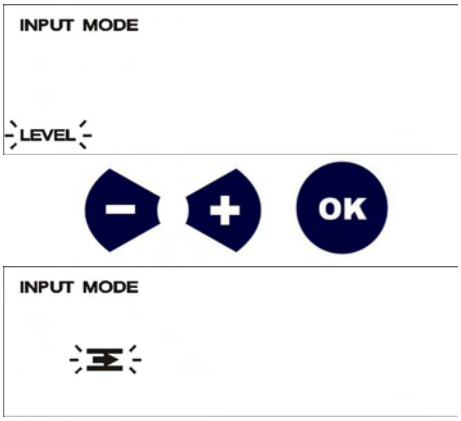
*After pressed **OK** in SELECT mode, the pump goes in password mode (only if FULL mode is active). Display show OFF (password disabled). Pressing **OK** will exclude the password, otherwise if the buttons **+** or **-** are pressed, password mode is enabled.*

*Pressing **OK** button, the display will show 0000. To set a password use **+** or **-** buttons to increase or decrease value that composes the password. To shift from the first digit to the followings ones press **Right Arrow**. Press **OK** to confirm the password.*

9.1.3 - Choice of Input Level/Flow

After the password has been determined, it is possible to set up the type of sensor that is necessary to install the pump:

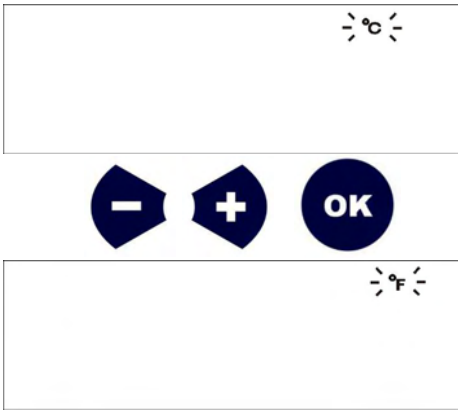
When a level sensor is needed to be connected, the LEVEL *warning will appear, on the other hand when it is necessary to connect a proximity sensor this icon will appear.*



9.1.4 - Temperature selection between Celsius and Fahrenheit degrees (Only for model PH-RX-CL/M)

Continuing in the SETUP menu, pressing ***OK,*** *it is possible to select temperature reading reading between Celsius and Fahrenheit degrees (°C or °F).*

To shift use **+** *or* **-** *buttons.*
Pressing ***OK*** *to confirm and to save the choice.*



9.1.5 - Temperature compensation

The pump allows to select manual or automatic temperature compensation. To activate the automatic compensation is necessary to connect a PT 100 thermal probe.

To select among manual or automatic (OFF or ON) use the **+** *or* **-** *buttons. Once the desired mode is select press* ***OK*** *to confirm.*

In the case user decides to activate the automatic compensation of the temperature there's no need of additional operations because the pump will automatically measure the temperature through the thermal probe.
On other hand when OFF (manual compensation) needs to be selected: on the display OFF icon will flash, pressing OK button, on the display will flash the default temperature value i.e. 25°C. Using **+** *and* **-** *buttons it is possible to change this value. When the desired value is reached press* ***OK*** *again and the values will be memorized.*

9.1.6 - Calibration exit delay

Thanks to this function user can select the time the pump will use to quit from calibration phase setting to come back to the main measuring display.

Using **+** *and* **-** *it's possible to set the delay time, from 0 second to 99 min 59 sec. To shift from minutes to seconds, press* ***Right arrow****, press* ***OK*** *to confirm.*

9.1.7 - Switching-on delay

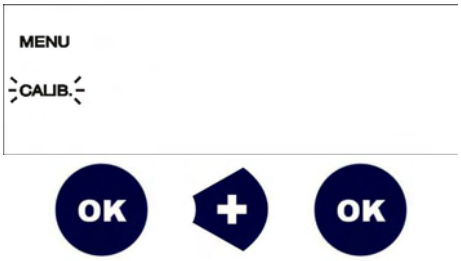
To solve the problem of inertia of some electrodes or plant installation, the pump has the possibility to set a delay time from pump switching-on to the measuring and control moment.

Using **+** *and* **-** *it's possible to set the delay time, from 0 to 99 min. 59 sec. To shift from minutes to second press* ***Right arrow.***
Press ***OK*** *to confirm.*

9.2 - MEASURING CALIBRATION

To calibrate the pump integrated controller, user has to adjust two calibration points for any kind of parameter, i.e. pH, Redox or Chlorine.

*To enter in CALIB. menu, from measuring mode, press **OK** button then the **+** button, on display CALIB. will flash, press **OK** button again to confirm.*



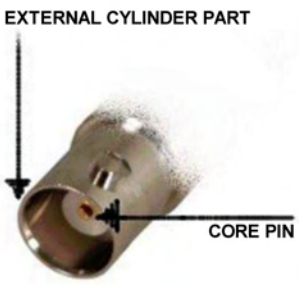
On display will appear POINT 1

pH PROCEDURE:

- *Dip the electrode in buffer solution 7.00.*
- *Adjust the value on the display up to reach 7.00 with **+** and **-** buttons.*
- *Press **OK** to save the data. On display will appear POINT 2.*
- *Dip the electrode after washing with tap water in the second buffer solution; we suggest 4.00 or 9.00 pH.*
- *Adjust the value on the display up to reach the second buffer solution value with **+** and **-** buttons.*
- *Press **OK** to save the data.*

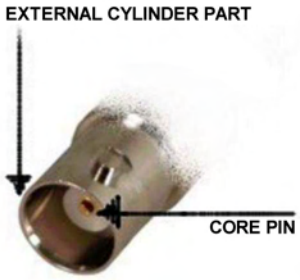
REDOX (mV) PROCEDURE:

- *Put in short circuit the BNC connector. Using a metal wire, connect the core pin with the external cylinder part.*
- *Adjust the value on the display up to reach 0 using **+** and **-** buttons.*
- *Press **OK** to save the data.*
- *On the display will appear POINT 2*
- *Dip the electrode in a buffer solution. We suggest 250, 475 or 650mV.*
- *Adjust the value on the display up to reach the buffer solution value using **+** and **-** buttons.*
- *Press **OK** to save the data.*



CHLORINE PROCEDURE (ppm Cl):

- *Put in a short circuit BNC connector (as shown in figure) using a copper wire.*
- *Adjust the value on the display up to reach 0 using + and - buttons.*
- *Press **OK** to save the data, on display will appear POINT 2*
- *Dip the chlorine probe in a water with dissolved chlorine. Using DPD method measure the chlorine level.*
- *Adjust the reading on display with + and - buttons up to reach the value measured.*
  It's important to have a good amount of chlorine for this point of calibration, we suggest at least 1ppm.
- *Press **OK** to save data.*



9.3 - SETPOINT SETTING

To have the pump operative it's mandatory set the following data: Setpoint values, type of dosing, hysteresis, manual or proportional dosing.

There are two different Setpoint setting procedures; if the pump setup activated FULL mode or BASE mode.
Let's start from the setting with BASE menu activated (see Chapter 9.1)

9.3.1 - Setpoint value

*From measuring status, pressing **OK**, the pump will go in SETPOINT programming phase. Setpoint icon will flash. Pressing **OK** again, the setpoint value saved will flash and can be adjusted using + and - buttons.*

*Pressing **OK**, the setpoint value will be memorized.*

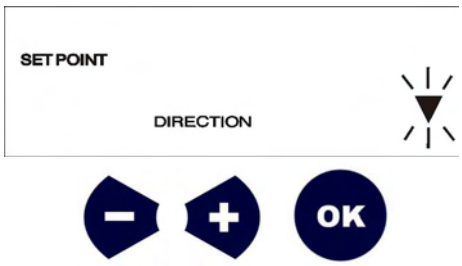
The pump automatically will go in DIRECTION menu

9.3.2 - Direction menu

In this menu, has to set if the pump has to dose above the setpoint or below this value. For instance to reduce pH value, dosing an acid chemical, the direction arrow has to point down. In this way the pump will be active, dosing, when the pH value is higher than the setpoint previously set.
For Redox (or chlorine) if the pump has to dose up to reach a certain quantity of oxidant (or chlorine), the direction arrow has to point in aloft.

To select the direction of the arrow, use the + and - buttons.

*Pressing **OK** the direction will be memorized.*



The pump automatically will go in Manual/Proportional menu (ON-OFF or PROP.) or in Hysteresis menu, this depends on SETUP setting. If FULL menu has been activated, Hysteresis menu will appear (go to paragraph 9.3.6), otherwise if BASE menu has been activated, Hysteresis menu will be not present and the pump will be driven with hysteresis default values that are:

0,1 pH; 10 mV; 0.05 ppm

9.3.3 - Manual or Proportional mode (BASE menu activated)

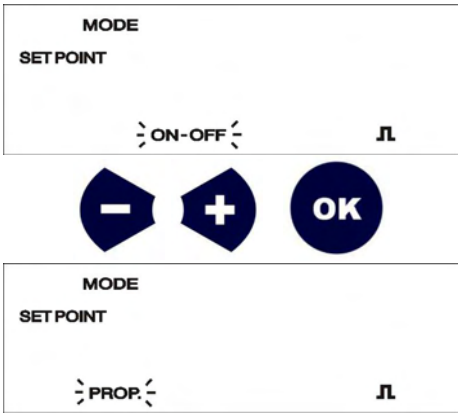
After selected direction of the dosing, the pump will show ON-OFF or PROP. flashing. With + or - buttons it's possible to shift among them.

ON-OFF - When the pump has to dose it will run at flow rate selected by the user in Flow rate setting, and it stops at the Setpoint.

*PROP. - In this mode the pump will dose proportionally to the setpoint value. The pump starts dosing over setpoint (determined by hysteresis), increasing its speed up to the MAX FREQUENCY ADJUSTMENT use will set after pressing **OK** from this menu.*

*Use **+** and **-** to select the operative mode.*

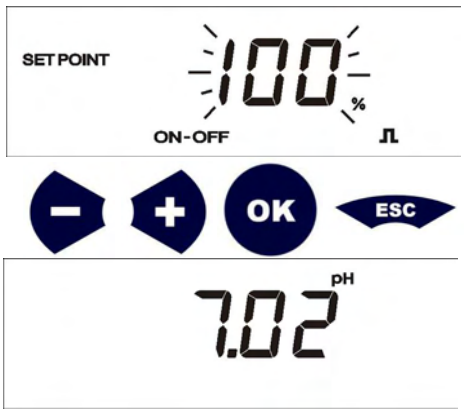
*Press **OK** to confirm the selection. Following will be described these two modes:*



9.3.4 - Frequency adjustment

*If the user has select Manual mode (**ON-OFF**), after pressing **OK** button, the pump will pass in Frequency adjustment menu. User has to set the flow rate of the pump, from 0 to 100% of maximum frequency.*

*Use **+** e **-** buttons to select the desired flow rate percentage.*
*Pressing **OK** the pump will save data and go out from Setpoint mode. It will be enough to press **ESC** button to go in metering mode.*



*Only in ON/OFF mode is it possible to define the time delay with regards to the Setpoint start-up, press the **+** and **-** keys to set the time in minutes and seconds. Press the **OK** key to confirm the values.*

9.3.5 - Max frequency adjustment

*If the user has select Proportional mode (**PROP.**), after pressing **OK** button, the pump will pass in Max frequency adjustment menu. User has to set at which pH, Redox or Chlorine level the pump has to dose at the maximum speed. The pump self controls its flow rate from this point, up to the setpoint where it stops dosing (please follow next 3 steps).*

*Use **+** and **-** buttons to select the maximum measure value to which the pump has to dose at the maximum frequency (STEP 1).*

*Pressing **OK** the pump will save data and go out from Setpoint mode. It will be enough to press **ESC** button to go in metering mode (STEP 2).*

(STEP 2)

(STEP 1)

(STEP 3)

*Pressing **OK** key, the device allows the setting of the minimum frequency at the Setpoint (STEP 3).*

Let's describe now the Setpoint procedure in case FULL menu activated (see paragraph 9.1)

9.3.6 - Hysteresis menu

After selected direction of dosing, user has to adjust the hysteresis value: distance from the setpoint value, over this value the pump starts or stops its dosing.

*After pressing the **OK** button the instrument goes to Hysteresis menu setting.*

*Press **+** and **-** to set the desired hysteresis value.*
*Press **OK** button to confirm and to save value.*

9.3.7 - 4÷20 mA calibration

The pump is equipped with a 4÷20 mA output for recorder or other device connection. Here in the picture is showed pH, but for each parameter pH, Redox or Chlorine pump will show corresponding pH, mV RX or ppm Cl on the display.

*After confirming with **OK** the Maximum Frequency Adjustment, the next step is to adjust two measure values that correspond to the mA output.*

*Press **+** and **-** to set the value of the measure to which it has to correspond 4mA output.*

*Press **OK** to confirm and to save data.*

*Press **+** and **-** to set the value of the measure to which it has to correspond 20mA output.*

*Press **OK** to confirm and to save data.*

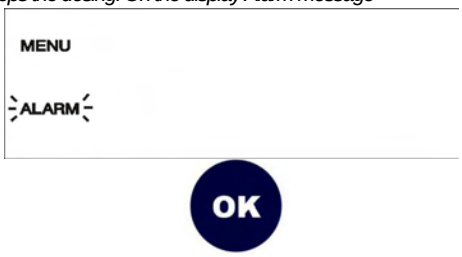
9.4 - ALARMS SETTING

It is possibleto to plan three different types of alarm pump:

1 - MAX: User can set at which maximum value the pump has to go in alarm mode. When the pump will go over this value, on the display, Alarm message will flash, Alarm Led will flash, in BT-BTB pH-RX-Cl/ M also the relay will be activated (relay output not present in version BT-BTB pH-RX-Cl/MB).

2 - min: User can set at which minimum value the pump has to go in alarm mode. When the pump will go over this value, on the display, Alarm message will flash, Alarm Led will flash, in BT-BTB pH-RX-Cl/ M also the relay will be activated (relay output not present in version BT-BTB pH-RX-Cl/MB).

3 - OVER: Overdosing alarm. For any kind of problems may occur in the plant (wrong calibration, dirty or broken probe, etc.) if the pump doesn't reach the Setpoint in OVER ALARM TIME, the pump stops the dosing. On the display Alarm message will flash, Alarm Led will flash, in BT-BTB pH-RX-Cl/ M also the relay will be activated (relay output not present in version BT-BTB pH-RX-Cl/MB).



The alarms mentioned above after a power supply loss will be off if the alarm conditions will be not present at the powering back of the pumps. Alarm signal is turned off by pressing the ESC button.

To enter in ALARM menu follow the procedure described in paragraph 9.1 - PUMP SETUP.

When ALARM menu is reached, press OK to enter in submenus

9.4.1 - Maximum Alarm setting

On the display will appear MAX and the value of measure will flash.

Press + and - to adjust the maximum value of the measure

*Press **OK** to confirm and to save data.*

9.4.2 - Minimum Alarm setting

On the display will appear "min" and the value of measure will flash.

Press + and - to adjust the minimum value of the measure

*Press **OK** to confirm and to save data.*

9.4.3 - Overdosing Alarm setting

On the display will appear OVER and time counter (h:min) will flash.

Press + and - to adjust the time, over which the pump will go in alarm.

*Press **OK** to confirm and to save data.*

This will end the alarm seeting.

*Press **ESC** to return in measure mode.*

9.5 - RESET PROCEDURE

The pump is equipped with two RESET procedures. It can be used any time the user has to reset some or entire calibration parameters.

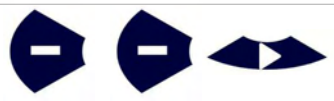
Following are described all the steps for partial RESET and for total RESET:

- *Turn off and turn on the pump*
- *Press once the **OK** button, it will appear SETPOINT menu*
- *Press at the same time button **+** and button **-** (user has15 seconds to make this operation after pressed **OK** button).*
- *On the display will appear RESET*

9.5.1 **Partial RESET procedure**

With this procedure a partial reset will be activated, the pump return to the default settings but all the calibration parameters will be saved.

- *On the display will appear RESET*
- *Press twice **-** button and then **Right arrow** button*
- *On the display will appear SELECT*



9.5.2 Total RESET procedure

With this procedure a total reset will be activated, the pump return to the default settings and all the calibration parameters will be lost.

- *On the display will appear RESET*
- *Press twice + button and then **Right arrow** button*
- *On the display will appear SELECT*

ATTENTION: after 15 seconds from entry in SETPOINT menu it isn't possible to activate the reset procedure. Therefore the user has to turn off and then turn on the pump and to repeat the reset procedure.

9.6 - STAND-BY PROCEDURE

With this procedure the pump is put on stand-by.

- *Hold down key + and - until Stand-by appears on the display*
- *In order to exit this mode, hold down keys + and -.*

10.0 – TROUBLESHOOTING FOR COMMON FAULTS

10.1 - MECHANICAL FAULTS

As the system is quite robust, normally there are no mechanical problems. Occasionally there might be a loss of liquid from the nipple because the tube nut has become loose, or more simply the outlet piping has broken. It is rare to detect losses due to a broken membrane or due to wear on the membrane seal gasket. In this remote case, the components must be substituted by removing the four screws on the pump body (Fig. 10), when the screws are reassembled tighten them equally to a maximum tightening torque of 180÷200 Nxcm. Once the liquid loss is repaired, clean the dosing pump of any additive residues which could attack the pump body.

- THE DOSING PUMP PULSES BUT DOES NOT SEND ADDITIVE TO THE PLANT

a. Disassemble the suction and outlet valves, clean them and place them back to the same position (Fig. 10). If the valves present swelling, check the table for compatibility between the additive and the valves being used in the pump (the standard valve is in Viton®; or another compatible elastomer, ball valves are an optional).

b. Check for a clogged filter.

Warning: When removing the dosing pump from the plant take care when sliding out the piping from the outlet fitting to avoid spilling any residual additive contained in the piping. Clean the pump body if any additive comes into contact with the body

10.2 – ELECTRICAL FAULTS

NO LEDS ON, THE PUMP DOES NOT INJECT.

Check that the power supply is present (current plug and socket). If the pump remains inactive contact our technical assistance centre.

11.0 – ORDINARY MAINTENANCE

Good ordinary maintenance and programmed checks guarantee over time good plant conservation and operation.
We therefore recommend to follow our advice for ordinary maintenance and to stipulate a programmed service and assistance contract with one of our Technical Assistance Centres of your choice.
Check for good pump operation at least every 6 months.
If the dosing pump is used continuously, make more frequent checks.
Check the headers for deposits, in this case they can be removed and washed well in water. If the deposits are difficult to remove with water, the parts can be washed with diluted hydrochloric acid (muriatic acid), obviously avoiding that the acid enters the piping and finally rinse with water.
Check and substitute regularly the non-return valve with the VITON rubber valve-pusher, the membrane, header 'O'Ring, as these are the parts which suffer the most deterioration over time.
To substitute the membrane unscrew the 4 screws, unscrew the membrane, substitute the 'O'Ring and reassemble all the parts back making sure to tighten the screws in an equal manner (alternatively in a crosswise direction and respecting the tightening torque indicated in fig. 10).
Check and substitute regularly the injector rubber as it is subject to deterioration due to wear and as it also acts as a seal it may cause a return of dosing product back to the pump.

12.0 – EXTRAORDINARY MAINTENANCE

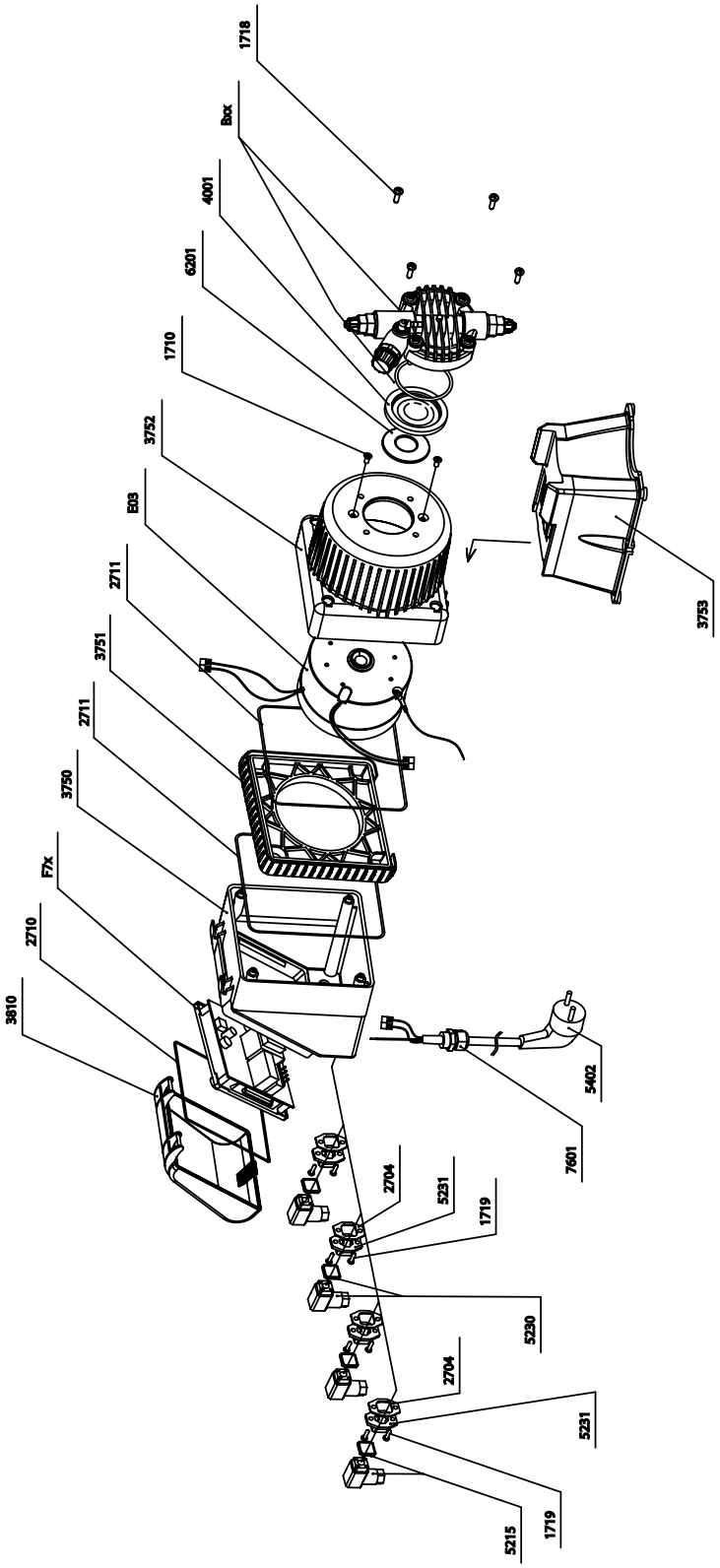
All components supplied are chosen and tested according to rigid selection principles and therefore guarantee, for a long period of time, the reliability and operation of our equipment.

Due to external problems (such as overvoltages, excessive pressure and water-hammers), any bad or improper use or programming errors, may render necessary extraordinary maintenance in addition to the ordinary maintenance already mentioned.

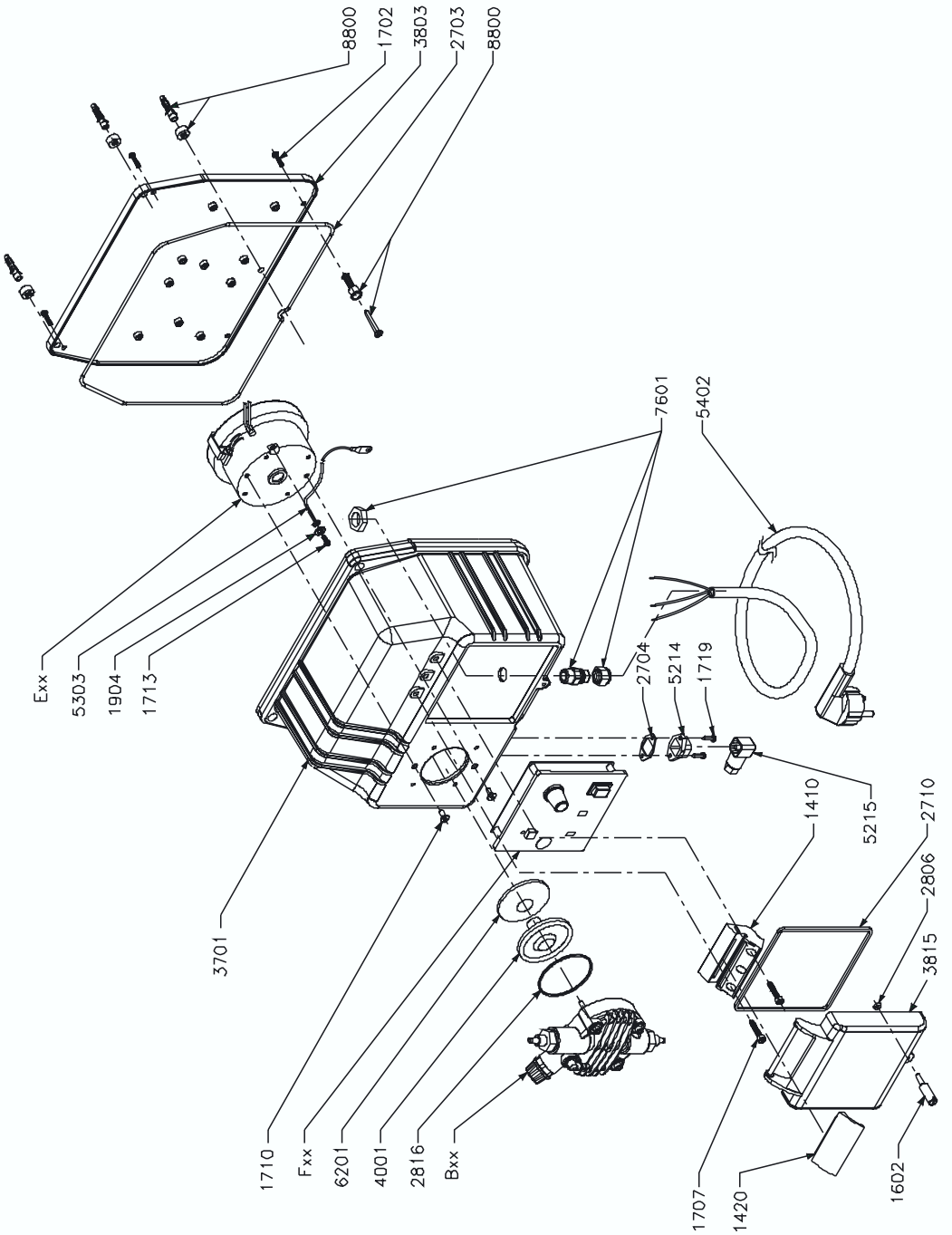
Following can be found a list of possible faults and ways to correct the faults.

Fault	*Fault correction*
The pump does not dose the product	• non-return valve deteriorated or badly assembled: assemble correctly or substitute the valve following ordinary maintenance instructions; • membrane deteriorated, substitute the part; • magnet fuse broken, substitute the fuse (check magnet resistance) • magnet burnt, substitute the magnet
The electronic part does not transmit impulses to the magnet	Broken printed circuit due to overvoltage or other causes, etc.: substitute the printed circuit
No leds are on	Check that the pump has a power supply (current plug and socket): If the pump remains inactive contact our technical assistance centre.
The pump pulses in an irregular manner	Check that the power supply values are within the limits indicated.
When the additive is finished the pump does not go into an alarm state	Check the connection between the sensor and its connector

Serie BTB Series



Serie BT Series

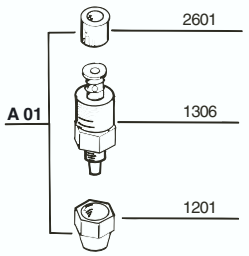


VALVOLE - *VALVES*

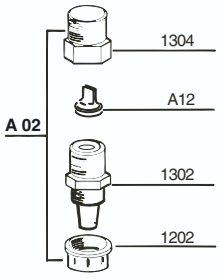
Valvole di iniezione complete di raccordo

Complete injection valves

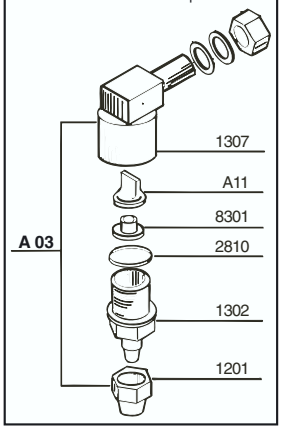
VALVOLA INIEZIONE STD. fino a 20 l/h
STD. INJECTION VALVE up to 20 l/h



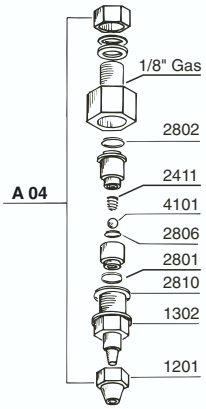
VALVOLA INIEZIONE 1/2" 50 l/h
1/2" 50 l/h INJECTION VALVE



VALVOLA INIEZIONE 90° fino a 20 l/h
90° INJECTION VALVE up to 20 l/h

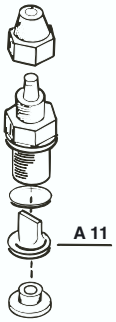


VALVOLA INIEZ. A SFERA fino a 20 l/h
BALL INJECTION VALVE up to 20 l/h

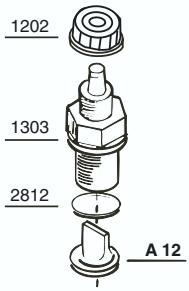


Valvole a labbro - *Lip valves*

VALVOLA A LABBRO 20 l/h
20 l/h LIP VALVE

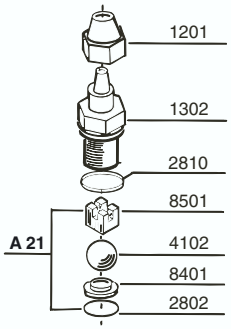


VALVOLA A LABBRO 50 l/h
50 l/h LIP VALVE

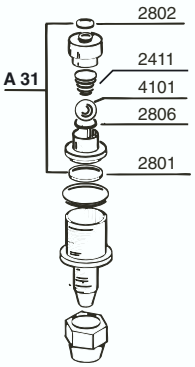


Valvole speciali - *Special valves*

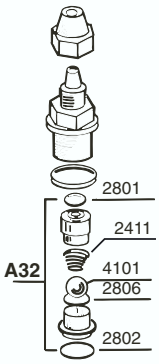
VALVOLA A SFERA GRAVITÀ 20l/h
20l/h GRAVITY BALL CHECK VALVE



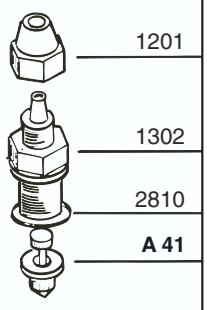
VALVOLA A SFERA ASPIRAZIONE
SUCTION BALL CHECK VALVE



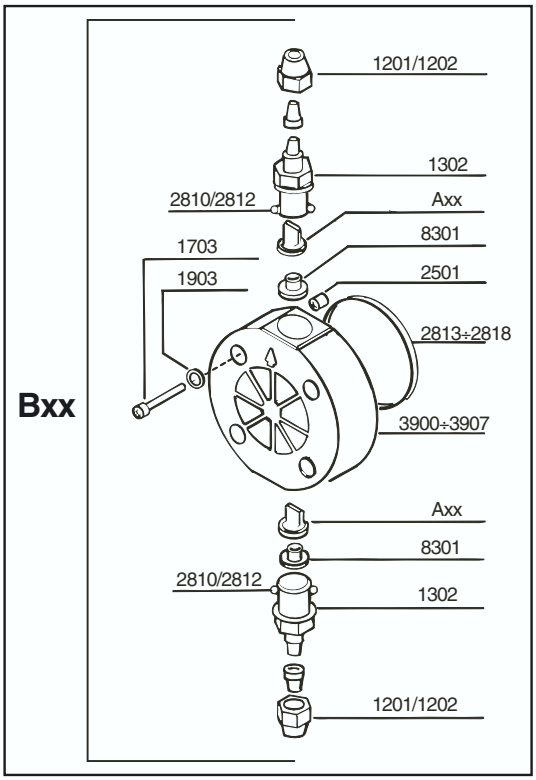
VALVOLA A SFERA MANDATA
DISCHARGE BALL CHECK VALVE



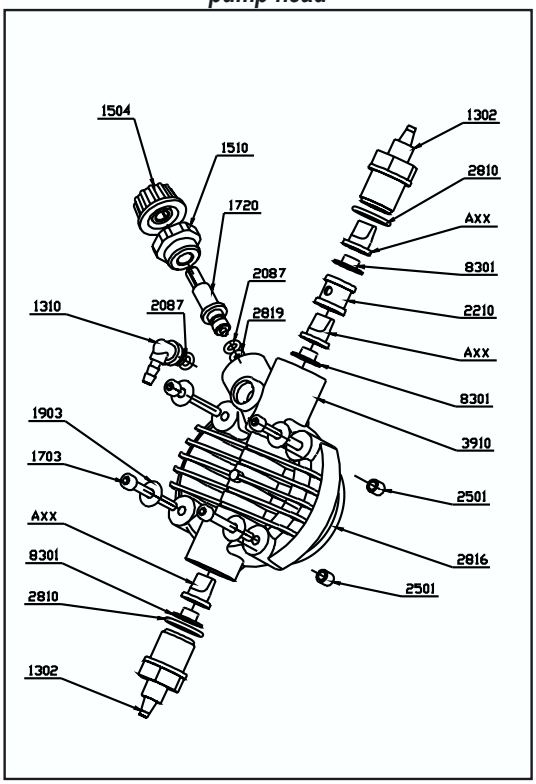
VALVOLA KALRETZ
KALRETZ VALVE



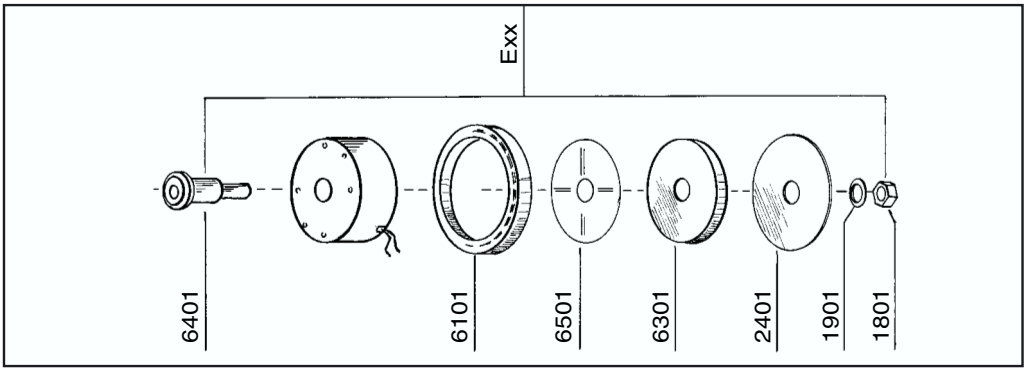
Corpo pompa completo:
P.P. - PVC - Acciaio inox - PTFE
Complete Pump Head:
P.P. - PVC - Stainless Steel - PTFE



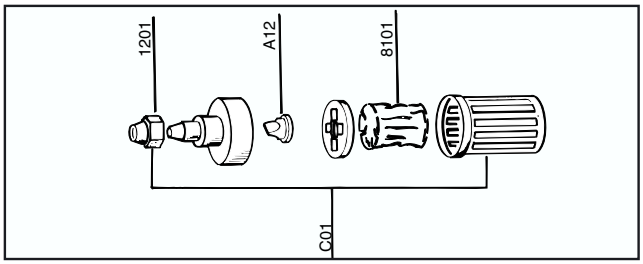
Corpo pompa con
spurgo manuale
Manual air bleed
pump head



Elettromagnete Completo - ***Complete Electromagnet***



Filtro Std fino a 20 l/h - ***Std Filter up to 20 l/h***



Note:

Note:

COD. DMU 00161ML1-A (11-2010)

A
B