



SOLENOID DRIVEN METERING PUMPS - MS.E SERIES -

USER MANUAL

TRANSLATION OF ORIGINAL INSTRUCTIONS

| | | | | | | |
|----------|------------------|---------|-----------|---------|-----------|--------------|
| Doc. N° | UT 5072-0 | Rel. | 0 | Lang. | EN | 1st Emission |
| Prepared | UM | Checked | SC | Replace | - | |

| Rel. | Revised sections | Checked | Date |
|------|------------------|---------|----------|
| 0 | First Emission | SC | 15/09/15 |
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1 DECLARATION OF CONFORMITY



DECLARATION OF CONFORMITY

(in accordance with the Machinery directive 2006/42/CE)



**OBL s.r.l. - Via Kennedy, 12
20090 Segrate – MILANO – ITALY**

We declare under our sole responsibility that the products:

SOLENOID DRIVEN METERING DOSING PUMPS - MS.e- SERIES –

Description: SOLENOID DRIVEN METERING PUMP

Manufacturing year: see tag on the machine.

complies with the Machinery Directive 2006/42/CE.

Conformity is declared under the following standards:

Electromagnetic compatibility (EMC) 2004/108/CE;

Low Voltage (LVD) 2006/95/CE;

Pressure equipment (PED) 97/23/CE;

ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction.

The manufacturer also declares that the Technical File of the machine is kept at:

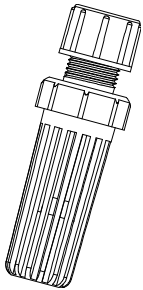
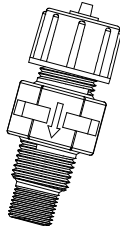
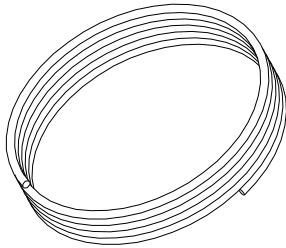
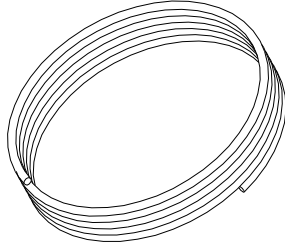
OBL S.r.l., Via Kennedy, 12 - 20090 Segrate (MI) – Italia



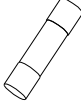
Segrate (MI), 15/09/2015

2 INTRODUCTION

The box contains:

| | |
|----------------------------|--|
| Nr.1 Metering pump | nr.1 injection valve |
| nr.1 instruction manual | nr.1 hose locking ring and tube holder for 4x6 mm tube |
| nr.1 suction foot & filter | nr.1 fuse |
| nr.1 suction tube | nr.2 screws and fixing bolts |
| nr.1 delivery tube | |

| Suction foot & filter | Injection valve | Delivery tube 4x6 mm – 2mt (dark polyethylene) | Suction tube 4x6 mm – 2mt (transparent PVC) |
|--|--|--|--|
|  |  |  |  |

| Kit Hose locking ring Tube holder for 4x6 mm | Fixing bolts d.6 Screws 4.5x40 | Fuse 5x20 |
|---|---|---|
|  |  |  |

WARNING



Warning! Please read the warning notices in this section very carefully, because they contain important information regarding safety in installation, use and maintenance of the pump.

Any intervention or repair to the internal parts of the pump must be carried out by qualified and authorized personnel. The manufacturers decline all responsibility for the consequences of failure to respect this rule.

3 REGULATION REFERENCE

The main reference for the composition of this manual is the Annex I of Machinery Directive 2006/42/EC.

In the design, manufacture and realization of the pump was used a series of Technical Standards in order to satisfy all the European health & safety requirements.

4 PRESENTATION

The pump has been constructed in accordance with best practice. Both its life and its electrical and mechanical reliability will be enhanced if it is correctly used and subjected to regular maintenance.

4.1 WARRANTY

All OBL metering pumps undergo a specific test before dispatch in accordance to OBL Quality System-

ISO-9001:2008, approved and certified by RINA (RINA Services S.p.A.).

OBL metering pumps have a warranty against defects in material and workmanship for twelve (12) months from the date first placed in service or twenty-four (24) months from dispatch by OBL (whichever comes earlier).

OBL's sole obligation under the warranty is to provide free of charge replacement (to be made at OBL, Segrate – Milan, Italy) of any part acknowledged as faulty by OBL because of a defect in material or workmanship during the warranty period.

Warranty DOES NOT applying in the following cases:

- Normal wear (e.g. seals, packing);
- If installation and/or utilization is not consistent to selling conditions and/or instruction manual.
- If OBL metering pumps are re-sold to other companies.
- Issues not attributable to a defect in material or workmanship
- Issues occurring after the expiration of the warranty period
- Inadequate or improper maintenance or monitoring
- Improper repair by anyone other than OBL
- Alteration, change or modification by anyone other than OBL
- Abrasive wear or corrosion attributable to materials being pumped

In case of warranty claim, OBL metering pumps are to be returned to OBL (DDP based) for inspection

and evaluation with relevant description of anomaly malfunction.

OBL metering pumps being returned must be cleaned from any chemical and properly packed. If received without cleanness certificate, OBL metering pumps will be sent back without checking and warranty claim will be denied.

Except as expressly provided above, Company makes no warranties or guarantees with respect to Products or Parts, express or implied, including but not limited to, implied warranties of merchantability or fitness for a particular purpose.

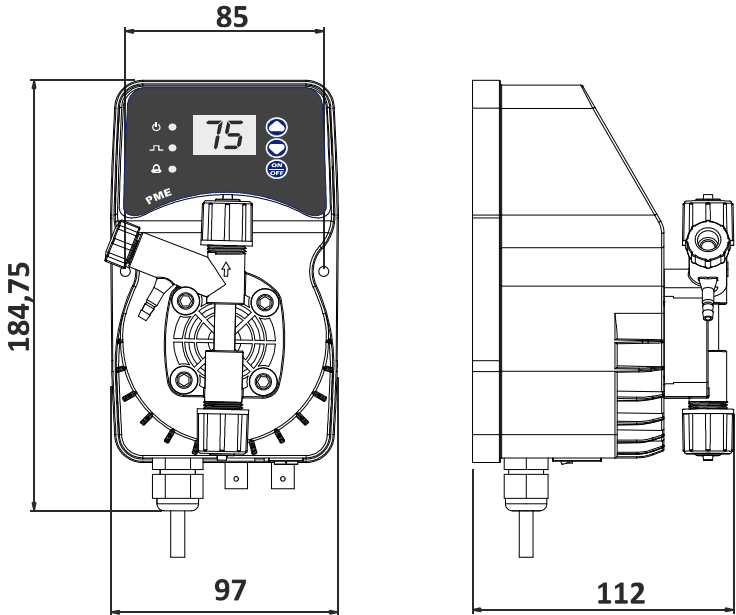


WARNING: Any intervention or repair to the internal parts of the pump must be carried out by qualified and authorized personnel. The manufacturers decline all responsibility for the consequences of failure to respect this rule.

5 TECHNICAL DATAS

| Model | Max Flow rate (l/h) | Max pressure (bar) | Max working frequency (imp/min) | ml/pulse | Max suction high (m) | Standard power supply (*) | Weight (kg) |
|----------|---------------------|--------------------|---------------------------------|----------|----------------------|---------------------------|-------------|
| MS 01-15 | 1 | 15 | 120 | 0,14 | 1.5 | 230 V – 50/60 Hz | 1,4 |
| MS 02-10 | 2 | 10 | 120 | 0,28 | 1.5 | 230 V – 50/60 Hz | 1,4 |
| MS 05-05 | 5 | 5 | 120 | 0,69 | 1.5 | 230 V – 50/60 Hz | 1,4 |

(*)Other power supply available on request

| Dimensions (mm) | Materials |
|--|--|
|  | <p>Box: Polypropylene+ 30% F.G.</p> <p>Pump head: PVDF</p> <p>Diaphragm: PTFE</p> <p>Connections: PVDF</p> <p>Foot filter: polypropylene (opt. PVDF)</p> <p>Injection valve: polypropylene (opt. PVDF)</p> <p>Suction tube: PVC crystal</p> <p>Delivery tube: polyethylene</p> <p>Standard valves: Ceramic ball</p> <p>Seats: FPM (on request: EPDM)</p> |

6 SHIPPING AND TRANSPORTING THE PUMP

The pump should always be moved in a vertical (and never in a horizontal) position.

7 PUTTING INTO SERVICE

7.1 ASSEMBLY

All metering pumps are normally supplied fully assembled. For greater clarity, please consult the exploded view of the pump added at the end of the manual, which shows all the pump details and a complete overview of all the pump components. These drawings are in any case quite indispensable whenever defective parts have to be re-ordered. For the same purpose, the appendix also contains other drawings showing the hydraulic parts (pump head and valves).

7.2 INSTALLATION

Install the pump in a dry place and well away from sources of heat and, in any case, at environmental temperatures not exceeding 40°C. The minimum operating temperature depends on the liquid to be pumped, bearing in mind that it must always remain in a liquid state.

Carefully observe the regulations in force in the various countries as regards electrical installations.

When the supply cable is devoid of a plug, the equipment should be connected to the supply mains by means of a single-pole circuit breaker having a minimum distance of 3 mm between the contacts. Before accessing any of the electrical parts, make sure that all the supply circuits are open.

Locate the pump as in Figure 1, bearing in mind that it can be fixed both below and above the level of the liquid to be dosed up to a maximum of 1.5 meters. The point of injection should always be placed higher than the liquid to be injected. If the system is operating at atmospheric pressure (additive free discharge) the additive tank must be absolutely positioned higher than the injection point; periodically check the function of the injection valve, because its excessive wear could lead additive infiltration inside the pump through gravity (even when the system is turned off). If the problem persists, insert a calibrated pressure valve between the pump and the injection point. For liquids that give off aggressive fumes, do not install the pump above the tank unless the tank is sealed.

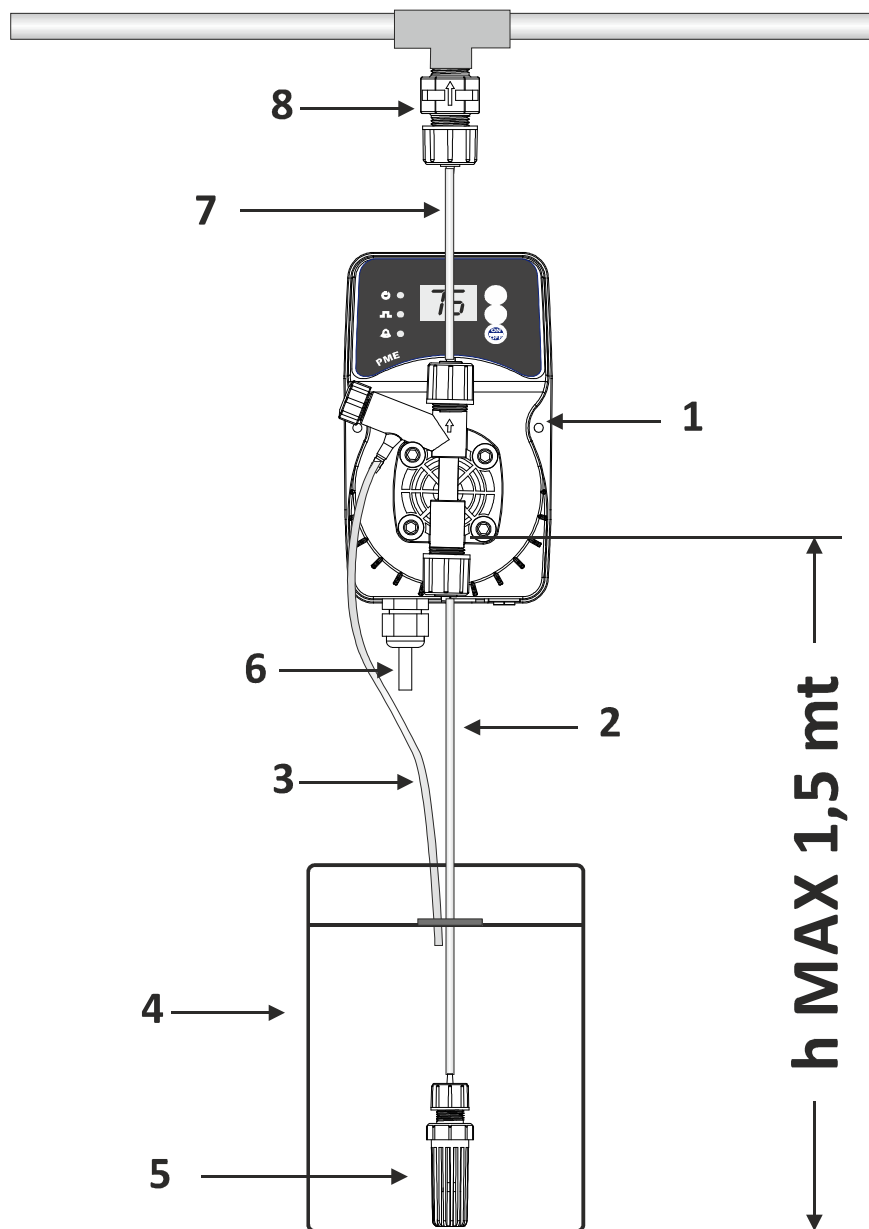


Figura 1

| | |
|---|----------------------------|
| 1 | Dosing pump |
| 2 | Suction tube |
| 3 | Delivery tube |
| 4 | Tank with chemical product |
| 5 | Foot filter |
| 6 | Power supply cable |
| 7 | Discharge tube |
| 8 | Injection Valve |

Suction foot & filter connection

Connect the suction transparent PVC tube to the filter, insert the tubes on the conical couplings and block them with the appropriate locking nuts (Figure 2).

Place the foot filter on the bottom of the tank, in a **vertical position**, containing the liquid to be dosed.

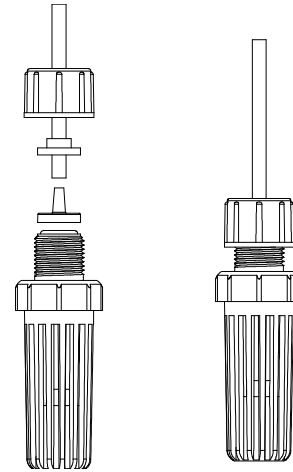


Figure 2

Suction Tube Connection

The suction ring is always at the bottom of the pump, where the tube will be mounted with the filter that goes to the container of the liquid to be dosed.

Remove the rubber disc that protects the connectors, insert the tubes on the conical couplings and block them with the appropriate locking nuts (figure 3).

1. Tube 4x6 (PVC transparent)
2. Locking nut
3. Hose locking ring
4. Tube holder
5. Check that the o-ring is present

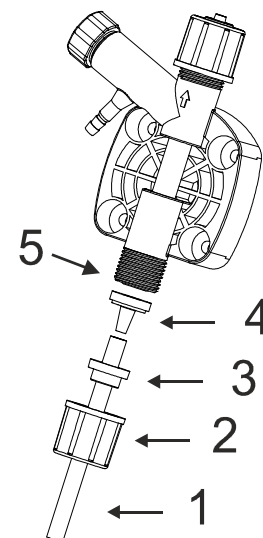
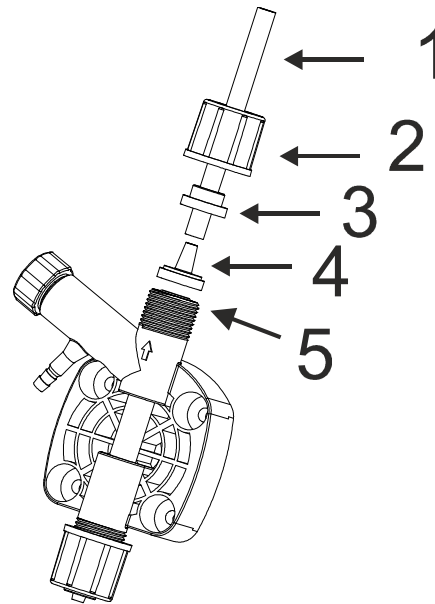


Figure 3

Discharge Tube Connection

The discharge nozzle is always at the top of the pump, where the tube that goes to the system must be connected

Remove the rubber disc that protects the connectors, insert the tubes on the conical couplings and block them with the appropriate locking nuts (figure 4)

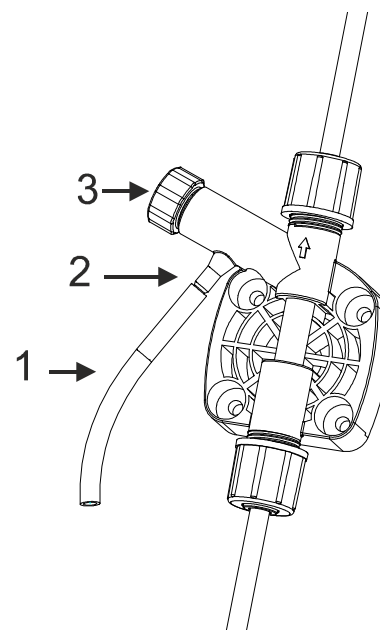


1. Tube 4x6 (dark polyethylene)
2. Locking nut
3. Hose locking ring
4. Tube holder
5. Check that the o-ring is present

Figure 4

Delivery tube connection

Insert the tube 4x6 (transparent PVC) on the drain fitting (Figure 5).



1. Tube 4x6 (PVC transparent)
2. Drain Fitting
3. Bleeding Needle

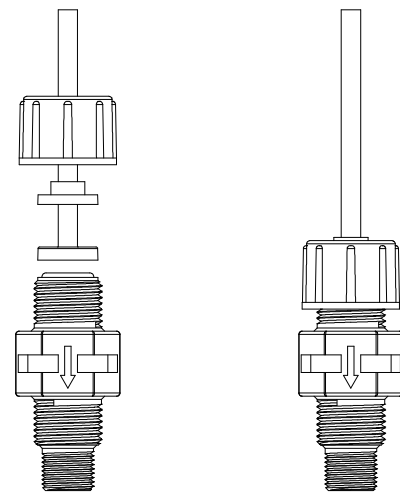
Figure 5

Injection Valve Connection

Put on the conduct of the plant to be treated, in the most suitable site for the injection of the product tank, a 3/8" or 1/2" female gas fitting. This connector is not supplied. Screw the injection valve into the fitting, using Teflon seal is advisable.

Connect the polyethylene tube (opaque - rigid) to the attack of the injection valve by first inserting the ring into the pipe and tighten up the bottom.

The injection valve is also a non return one.



Select the most appropriate injection point on the delivery tube of the plant and there fit a 3/8" female steel gas thread connector (similar to BSPm). This connector is not supplied with the pump. Screw the injection valve to the gas connector by inserting a gasket. Then connect the discharge hose to the conical connector on the injection valve and fix it with the supplied tube nut G. The injection valve also acts as no return valve by means of a cylinder sleeve (elastomer, standard supplied in Viton)

7.3 PUTTING INTO SERVICE AFTER A DISMANTLING

Whenever the pump is dismantled from the pipe-work, you will be well advised to replace the caps on the connectors to avoid residual liquid being spilled. Before attaching the delivery hose to the plant, prime the metering pump. Before finalizing the installation of the discharge hose, make sure that the pump strokes will not cause it to move and bump into rigid bodies. In case of priming difficulties, use a normal syringe to suck liquid from the discharge nipple while the pump is operating, continue until you see the liquid rising in the syringe. Use a short length of suction hose to connect

the syringe to the discharge nipple. In case of a pump equipped with an air bleed valve, unscrew the air relief valve B until all the air in the pump head is out.

Try to keep both suction and discharge hoses as straight as possible, avoiding all unnecessary bends

7.4 Load test

After installation it's necessary to verify the proper operation of the power supply

- **Verify before the first use/set up/maintenance activity the lack of electricity in the machine**



7.5 Space for maintenance and use

The space for maintenance and use is 0,5 m.

7.6 Environmental conditions

Install the pump in a dry place and well away from sources of heat and, in any case, at environmental temperatures not exceeding 40°C. The minimum operating temperature depends on the liquid to be pumped, bearing in mind that it must always remain in a liquid state.

7.7 Information related to removal/elimination of waste material

Pump doesn't produce any waste material.

8 MEAN FEATURES

8.1 SPARE PARTS

In case of breakdown or improper functioning of the pump, switch off, but do not touch. Contact our technical assistance for any necessary repairs and insist on the use of original spares. Failure to respect this condition could render the pump unsafe for use.

8.2 PROPER USE OF THE PUMP

The pump should be used only for the purpose for which it has been expressly designed, namely the dosing of liquid additives.

8.3 PROHIBITED USE OF THE PUMP

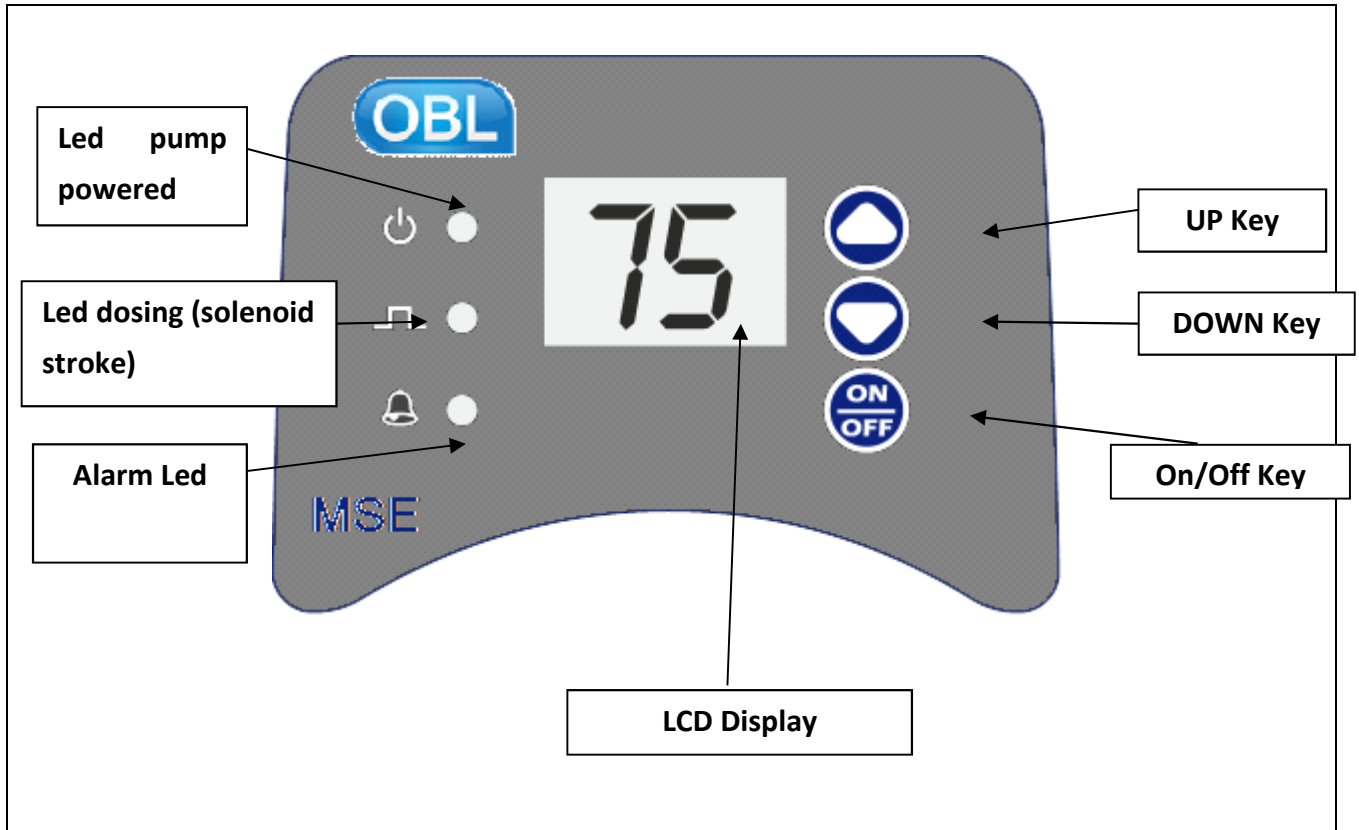
Any different use is to be considered improper and therefore dangerous. The pump should not therefore be used for applications that were not allowed for in its design. In case of doubt, please contact our offices or the authorized distributor for further information about the characteristics of the pump and its proper use. The manufacturer cannot be held responsible for damage deriving from improper, erroneous or unreasonable use of the pump.

8.4 Documents attesting that the equipment complies with the provisions of the law

See chapter 1 for the declaration of conformity.

9 INSTRUCTION FOR USE

9.1 CONTROLS



9.2 SET UP

Using “START” and “STOP” keys it is possible to respectively activate the pump or pause the pump.

Using arrow keys Up and DOWN it is possible to set the flow rate of the pump according to the percentage adjustment.

The LCD displays the flow rate setting.

The LEDs indicates:



- If the pump is turned on (from the mains) (green LED)
- The pulse of the magnet (red LED)
- The alarm condition (probe level) (yellow LED)

9.3 Troubleshooting

| Malfunction | Possible cause | Solution |
|---|------------------------------|---|
| Display switch-off | No power supply | Check the electrical connections Check if the power supply printed on the instrument label is corresponds with local electrical supply |
| | Internal fuse has blown | Change the fuse |
| Display switched on but the pump doesn't work | Pump in pause | Push the On/Off key |
| | The pump regulation is on 0% | Check the percentage regulation on the display |
| With no chemical product in the tank the pump isn't under alarm condition | Level probe faulty | Check if the level probe connection is ok |
| | | Check the level probe |
| Pump gives strokes but without dosing | Valves don't work correctly | Clean the valves and restart the pump |
| | Foot filter obstructed | Clean the foot filter and restart the pump |
| | The chemical generates gas | Open the bleed valve on the pump head, start the pump and eject the gas, then close the bleed valve when chemical is ejected from the tube exit |

If it isn't possible to correct the pump actions, please contact your local distributor.

9.4 *Personal protective equipment*

  It's necessary the use of individual safety devices to ensure and protect the safety of personnel, who must also be properly trained.

Personal protective equipment must to be CE marked.

10 MAINTENANCE

Periodically check the chemical tank level to avoid the pump operating without liquid. This would not damage the pump, but may damage the process plant due to lack of chemicals.

Check the pump operating condition at least every 6 months, pump head position, screws, bolts and seals; check more frequently where aggressive chemicals are pumped, especially: pulse and power L.E.D.; the additive concentration in the pipework; a reduction of this concentration could be caused by the wearing of the valves, in which case they need to be replaced or by the clogging of the filter which then has to be cleaned.

The Company suggests periodically cleaning off the hydraulic parts (valves and filter). We cannot say how often this cleaning should be done as it depends on the type of application, we also cannot suggest what cleaning agent to use as this will depend on the additive used.

Operating suggestions when dosing sodium hypochlorite (most frequent case):

- a** - disconnect the pump from the mains .
- b** - disconnect discharge hose from pipework;
- c** - remove the suction hose (with filter) from the tank and dip it into clean water;
- d** - switch on the metering pump and let it operate with water for 5 to 10 minutes;
- e** - switch OFF the pump, dip the filter into a hydrochloric acid solution and wait until the acid finishes cleaning;
- f** - switch ON the pump again and operate it with hydrochloric acid for 5 minutes in a closed-circuit, with suction and discharge hose dipped into the same tank;
- g** - repeat the operation with water;
- h** - re-connect the metering pump to the pipework.

10.1 *How to operate when dosing sulphuric acid*

In this case it is essential to bear in mind the following:

1. replace PVC crystal suction hose with polyethylene discharge hose;

2. empty any residual water from the pump head beforehand. If the water mixes with sulphuric acid it can produce a large quantity of gas with consequent overheating of the area causing damage to valves and pump head.

This operation can also be done with the pump disconnected from the plant by turning the pump upside-down for 15 to 30 seconds and without connecting the hose to the nipples; if impossible, dismount and remount the pump head using the four mounting screws.

11 PUTTING OUT OF SERVICE

11.1 DISMANTLING

Proceed as follows before dismantling the pump or before performing any other operation on it:

1. Disconnect the pump from the mains.
2. Relieve all the pressure from the pump head and injection tube.
3. Drain or flush all dosing liquid from the pump head. This operation can also be done with the pump disconnected from the plant by turning the pump upside-down for 15 to 30 seconds and without connecting the tubing to the nipples: if this operation is not possible, dismount and remount the pump head using the four mounting screws.

11.2 DEMOLITION AND DISPOSAL

Pumps is composed by plastic and metal.

Is a User responsibility to respect regulations and laws of the country where it operates for the waste disposal related to the maintenance or the equipment demolition.



It's absolutely prohibited to download substances in sewer or to leave wastes in the environment. Contact local administrations to receive proper informations.

12 SAFETY RULES FOR MAINTENANCE AND USE

After unpacking the pump, make sure it is completely sound. In case of doubt, do not use the pump and contact a qualified person. The packing materials (especially bags made of plastics, polystyrene, etc.) should be kept out of the reach of children: they constitute potential sources of danger. Before you connect the pump, make sure that the voltage ratings, etc., correspond to your particular power supply. You will find these values on the rating plate attached to the pump. The electrical installation to which the pump is connected must comply with the standards and good practice rule in force in the country under consideration.

Use of electrical equipment always implies observance of some basic rules: In particular:

- 1 - do not touch the equipment with wet or damp hands or feet;
- 2 - do not operate the pump with bare feet (Example: swimming pool equipment);
- 3 - do not leave the equipment exposed to the action of atmospheric agents;
- 4 - do not allow the pump to be used by children or unskilled individuals without supervision;

In case of breakdown or improper functioning of the pump, switch off, but do not touch. Contact our technical assistance for any necessary repairs and insist on the use of original spares. Failure to respect this condition could render the pump unsafe for use.

When you decide to remove from service an installed pump, ensure it is disconnect from the power supply.

Before carrying out any service on the item, check:

1. Disconnect the pump from power by means of a two poles switch with 3 mm minimum distance between the contacts, or removal of any plug or cable connector.
2. Relieve all the pressure from the pump head and injection tube.
3. Drain or flush all dosing liquid from the pump head. This operation can also be done with the pump disconnected from the plant by turning the pump upside-down for 15 to 30 seconds and without connecting the tubing to the nipples: if this operation is not possible, dismount and re-mount the pump head using the four mounting screws.

In event of possible losses in the hydraulic system of the pump (breakage of the "O" ring gasket, the valves or the hoses) the pump should immediately be brought to a stop, emptying and depressurizing the delivery hose while taking all due safety precautions (gloves, goggles, overalls, etc.).

Toxic and/or dangerous liquid dosage

To avoid risk from contact with the hazardous liquids or toxic fumes, always adhere to the notes in this instruction manual:

Follow the instructions of the dosing liquid manufacturer.

Check the hydraulic part of the pump and use it only if it is in perfect condition.

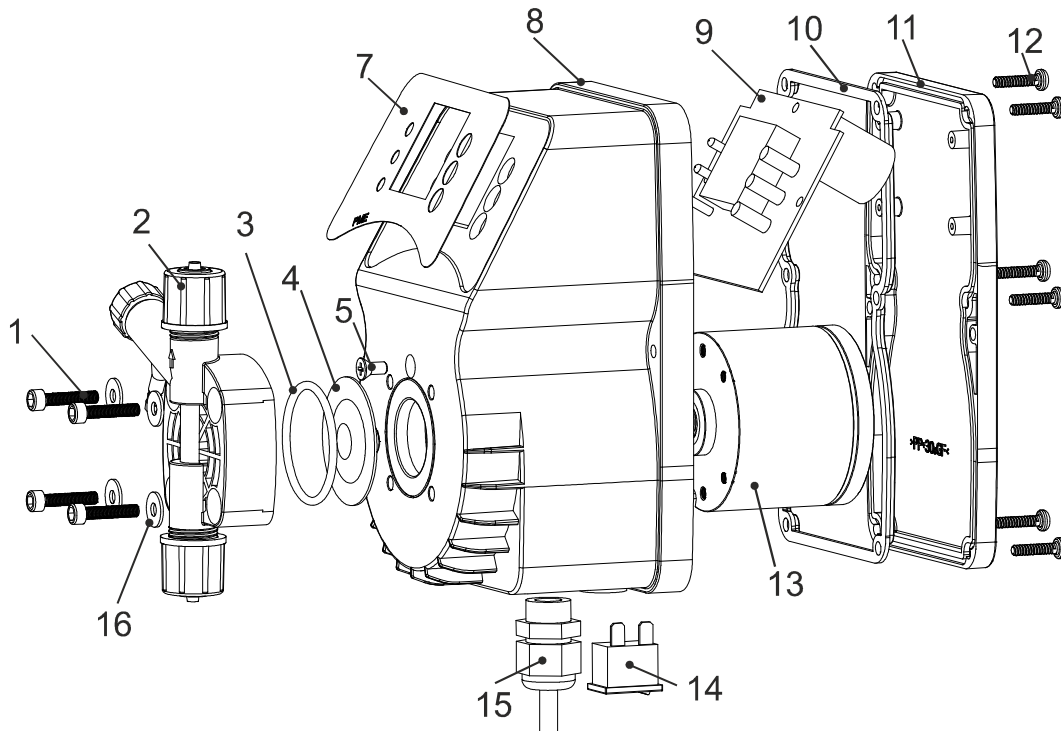


Use only the correct materials for the tubing, valves and seals to suit the liquid to be dosed; where possible shield the tubing with PVC conduit.

- Before disconnecting the metering pump, make sure to flush out and neutralize the pump head with the proper reagent liquid.

13 ATTACHEMENTS

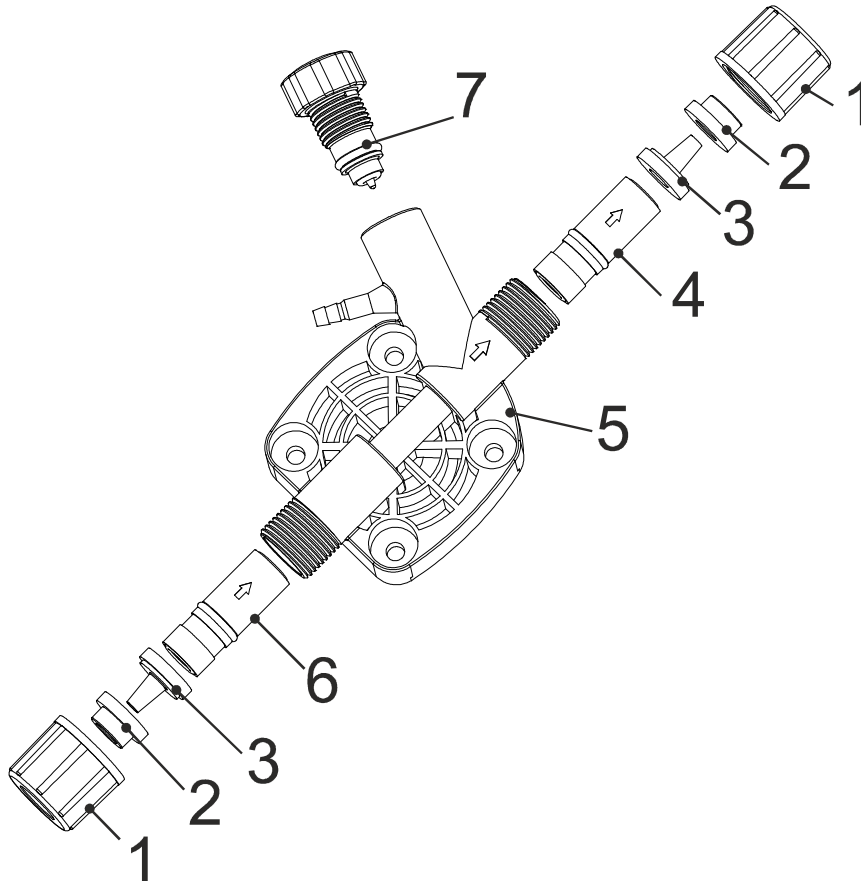
13.1 EXPLODED MS.e SERIES



| Posizione | Descrizione | Codice |
|-----------|--|----------------------|
| 1 | TCCE Inox M4x20 Screw | 00410034 |
| 2 | PVDF pump's body Ball valve (FPM – Viton) PVDF pump's body Ball valve (EPDM – Dutral) | 99680120 99680121 |
| 3 | OR 3143 FPM – Viton OR 3143 EDPM – Dutral | 00430062 00430154 |
| 4 | PTFE Diaphragm | 00400555 |
| 5 | TSPC 4x16 Screw | 00410052 |
| 7 | MS.e Front Panel | 00340174 |
| 8 | Ms.e Box | 00620143 |
| 9 | MS.e Circuit (cod. referred to 230Vac supply) | 99300156 |
| 10 | MS Gasket | 00620144 |
| 11 | MS box cover | 00620143 |
| 12 | 3.5x16 Screw | 00410036 |
| 13 | Complete Magnet (specify rate and power) | 99680180 |
| 14 | Switch +COVER | 00213016+00231017 |
| 15 | MS Power supply cable + PG9 Cable gland | 00220037 |

| | | |
|----|----------------------|----------|
| 16 | Inox M4 plain Washer | 00410055 |
|----|----------------------|----------|

13.2 EXPLODED PUM BODY – BALL VALVE



| Posizione | Descrizione | Codice |
|-----------|--|----------------------|
| 1 | PVDF CPVSe Ferrule | 00620139 |
| 2 | PVDF Tube's ring 6 mm | 00620140 |
| 3 | PVDF Tube holder 6 mm | 00620141 |
| 4 | Delivery valve cartridge (FPM – Viton) Delivery valve cartridge (EPDM – Dutral) | 99680220 99680221 |
| 5 | PVDF VSe Pump's body | 00620137 |
| 6 | Suction valve cartridge (FPM – Viton) Suction valve cartridge (EPDM – Dutral) | 99680222 99680223 |
| 7 | Drain Fitting (FPM – Viton) Drain Fitting (EPDM – Dutral) | 99680224 99680225 |

