



Dosing machine



Operation and maintenance manual

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EU conformity certificate

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Piacenza

CE

DICHIARAZIONE CE DI CONFORMITÀ

IL FABBRICANTE: P.L.P. Liquid Systems srl
Via 1° Maggio, 4
29018 LUGAGNANO VAL D'ARDA (PC)

DICHIARA SOTTO LA PROPRIA RESPONSABILITÀ CHE
LA MACCHINA NUOVA, MODELLO:

PRO BOERA 1.A

È CONFORME ALLE DISPOSIZIONI LEGISLATIVE
CHE TRASPONGONO

LA DIRETTIVA MACCHINE 89/392 E I SUOI SUCCESSIVI
EMENDAMENTI
91/368, 93/44 E 93/68, 89/336, 92/31, 73/23, 98/37

Il fabbricante fa divieto d'utilizzo della macchina/attrezzatura
oggetto di questa dichiarazione in modo difforme da quanto
riportato sul manuale d'uso e manutenzione.

NOME: PRATI

POSIZIONE : RESP. UFFICIO TECNICO



General characteristics

USING THE MACHINE

The “PRO BOERA 1.A.” dosing machine was designed for use in the wine industry, and more specifically for the dosing of gum arabic or any other liquid additive before bottling after micro-filtering.

The aim is to obtain an end product, and at the same time avoid clogging and leaks of gum in the filter cartridge, by using a quality product which is not easily contaminated with contaminants.

The “PRO BOERA 1.A 1P” dosing machine can dose 1 additive at a time.

The “PRO BOERA 1.A 2P” dosing machine has 2 piston dosing pumps and 1 expansion card. It can simultaneously dose two additives on the line and you can view the data for the two doses.

The “PRO BOERA 1.A 3P” dosing machine has 3 piston dosing pumps and 2 expansion cards. It can simultaneously dose three additives on the line and you can view the data for the three doses.

DESIGN OF THE MACHINE:

The machine has a simple but functional design.

It takes up minimal room and it can usually be put alongside other equipment without any issues.

The dosing machine has DN 40 lateral connections for the inlet and outlet on the wine production line.

The gum arabic is sucked up directly from the container by the dosing pump fitted with a filter and a non-return valve.

The pump flow may be restricted by manually operating a three way-microvalve, which makes it possible to clean the dosing line and helps to fill the pump tubes quickly when restarting the cycle manually.

Multi-voltage type mains supply, i.e. ranging from 80 V to 240 V, and therefore does not require different connections for each country where the machine is used.

Operation of the electrically powered parts is done with 24 V d c low-voltage circuits, protected from current surges by integrated system circuits.

MAIN COMPONENTS:

a) The dosing machine frame is manufactured with stainless steel and has protectors for the wine connections.

b) The magnetic flow meter for the wine line is manufactured with stainless steel and Teflon. The retaining ring is standard for all models. It can be taken apart quickly, without having to do anything to the pipe for the wine flow. High reliability over time and precise measurements.

Operating principle: electromagnetic type (Faraday's law). The measurement of a duct immersed in a magnetic field undergoes deformation which is proportionate to three values: length of the duct, intensity of the current and the advance speed.

c) The stainless steel dosing pump is activated by a 24 V d.c. motor. Ceramic pump piston, Viton stop. Double plug valve placed inside the pump.

d) Electronic part manufactured with cutting-edge technology:

- Panel fitted with multifunction buttons.
- LCD display with 4 lines for viewing information.
- Parallel port for PC or printer output.
- Digital output for the dosed product.
- Infrared (IR) port for bi-directional communication.

OPERATION

The operating logic for the dosing pump is as follows:

- Detection of the flow of wine.
- Dosage of the additive based on the dosage programmed.
- Total the measured values.
- Communication (if required) with other electronic devices (PC, printer, laptop).

With an electronic keyboard, the user can choose the quantity of gum arabic to dose manually or automatically.

In manual mode, the quantity is programmed with the + or - keys: in this case, the flow of gum arabic is constant and does not change if the flow of wine varies.

Operation in manual mode allows the operator to wash and fill the system quickly.

In automatic mode, and with the appropriate keys, the user selects the quantity of

additive per hectolitre of wine and the system begins dosing.

When the wine goes through, the electromagnetic flow meter measures the flow of wine continuously and the signal emitted (4 - 20 mA) is sent to the electronic control unit, which will transform it into an absolute measurement (L/h, - hL/h, etc.). The piston pump will then be activated by this control unit and will measure the quantity of gum arabic programmed. Adjustments are made by varying the motor rotation speed; this variation is sent to the control unit by a sensor placed at the inlet, and the speed will be corrected (feedback adjustment).

- When the gum arabic circuit is operating, an electronic pressure sensor is used to avoid overpressure which could damage the pump, and at the same time sends data confirming proper functioning or, on the contrary an alarm, to the electronic control unit.

- If the flow of wine varies, the quantity of gum arabic dosed will also change in order to consistently maintain the percentage of additive. Also, if the flow of wine stops, the dosing of gum arabic will also stop. As soon as the wine flows again, dosing will resume automatically.

- The quantity supplied will be added up and saved in the internal memory until it is cancelled by the user. The system has a data file which cannot be deleted by the user and which is only accessible with an electronic or removable key via an IR port.

- The dosing machine is calibrated by our technicians before it is delivered and therefore does not require calibration. These functions can only be programmed by qualified staff.

Machine parts

- Electrical connection: 230 - 240 V
- 10 Amp fuse
- SPU-150-24Z 230V - 24V AC-DC power adapter
- VES1013 24V electronic dosing machine part
- FRN 0.4 C1E – 7E inverter
- A 125N25F17 additive pump
- Pulse sensor
- AP1024DN32 flow meter
- Connection: DIN 11851-52 DN 40

- Pressure regulator
- 0 - 16 bar - 4 - 20 mA pressure sensor

With the second liquid

- C2037 expansion card
- FRN 0.4 C1E – 7E inverter
- Additive pump
- AP1024DN32 flow meter
- Pressure regulator
- 0 - 16 bar - 4 - 20 mA pressure sensor

N.B. Only the standard parts of the machine have been indicated.

Flow rates

- Wine flow rate: 0.34 to 30 m³/h
- Additive flow rate: up to 20 l/h

N.B.: Flow rates can change if you change machine parts.

Moving the machine

Lift the machine by its handles. To transport it, put the machine on a platform and use special machines (forklift truck, pallet truck, etc.).

The machine should always be in upright position when transported. The machine must not be laid down because the casing or internal parts could be damaged.

Adjust the support feet to ensure it is stable. There is no need to attach the machine to the floor.

Installation

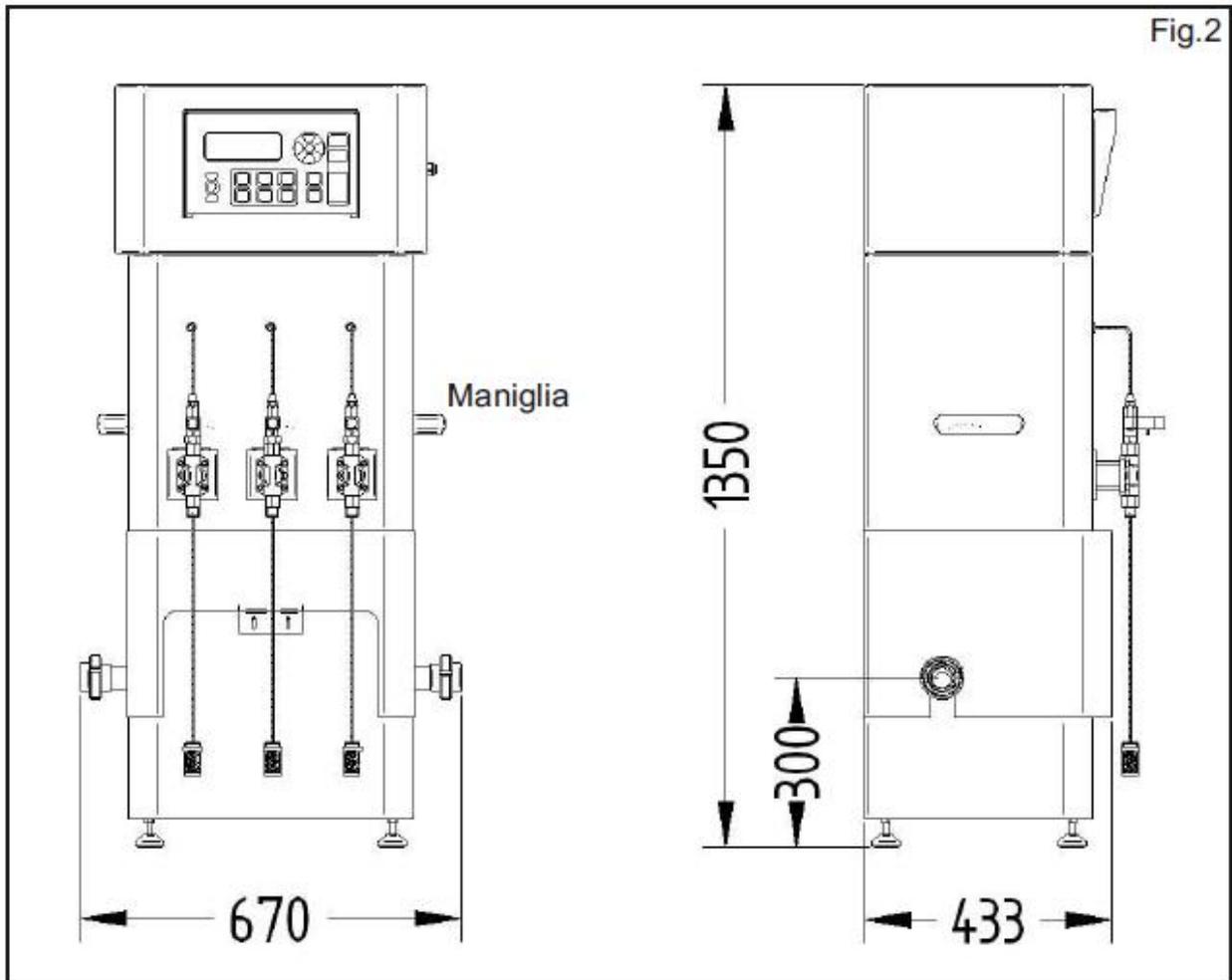
Connect the inlet and outlet pipe for the main product with the DIN 11851 (male and female) standard flexible pipe.

Avoid tight bending close to the inlet and outlet because it could create turbulence and therefore incorrect measurements by the instruments. It is recommended that you have at least a 1-metre straight segment of pipe before the inlet and after the machine outlet.

Check the correct entry and exit position on the machine, which is indicated by arrows or IN-OUT. To check the correct entry position, open the panel at the back of the machine. The flow meter must be on the entry side.

Put the additive at the side of the machine and insert the dosing pump pipe.

Connect the machine with a 220 V electrical current.



Calibration

The machine is ready to use and calibrated by our technicians with the test bench prior to being delivered.

If the machine has been tampered with, contact our technical department immediately.

Work cycle

The user just has to establish the percentage of additive to release (with the + and - keys) and connect the dosing machine by pressing the fast-on keys. The machine will dose the exact quantity of additive based on the flow of wine flowing continually.

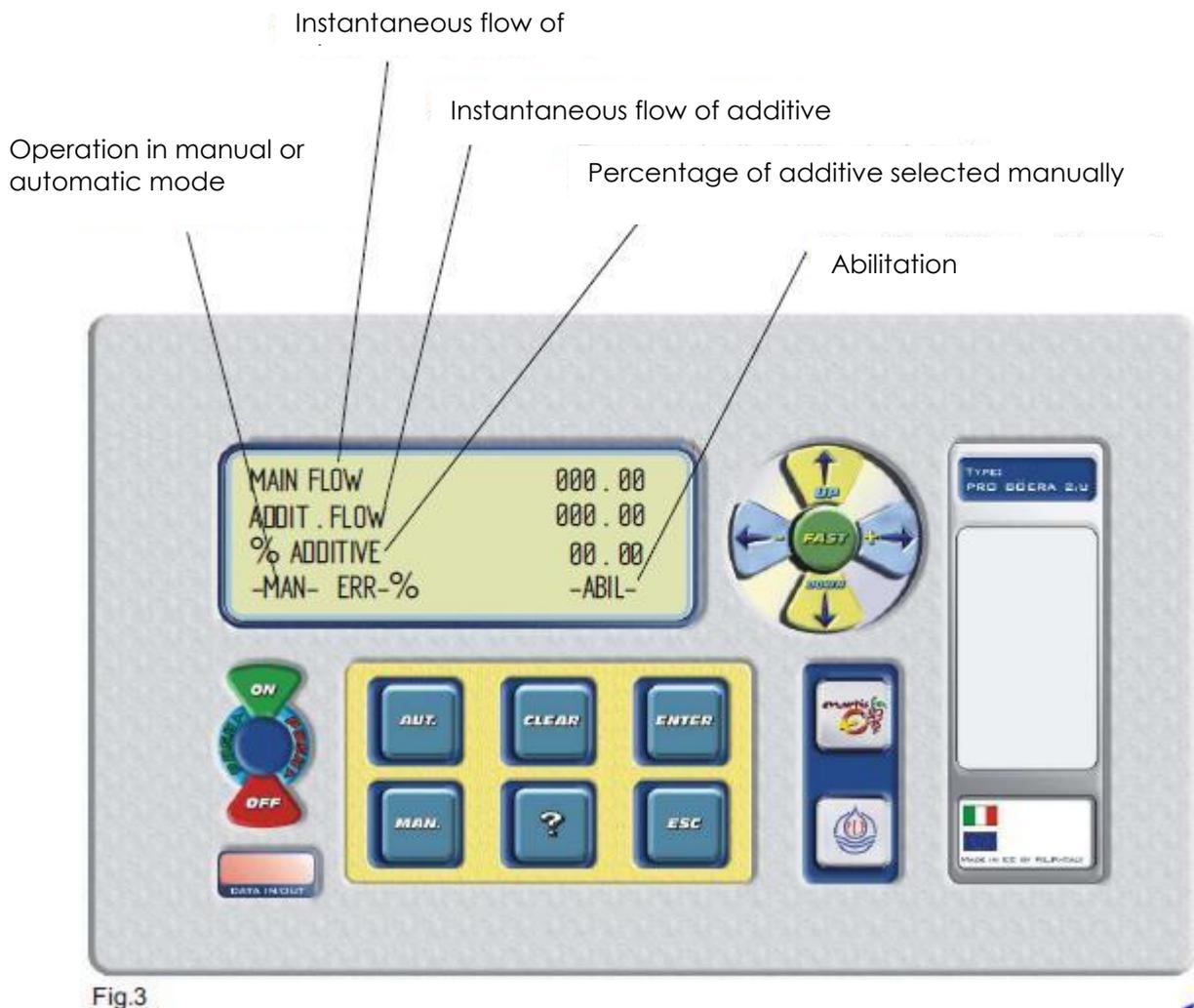


Fig.3

Cleaning and sterilisation

The machine and the bottling line must be cleaned regularly.

Use hot water and non-corrosive additives for sterilisation.

If you want to clean the wine flow line, you must replace the additive container with another one that contains hot water. Select Manual mode and increase the proportion of the dosage and wait for between 5 and 6 minutes.

If you cannot clean the wine flow line, you need to remove the rear cover to close the gum valve and open the bypass valve.

(Reposition the valves immediately after washing).

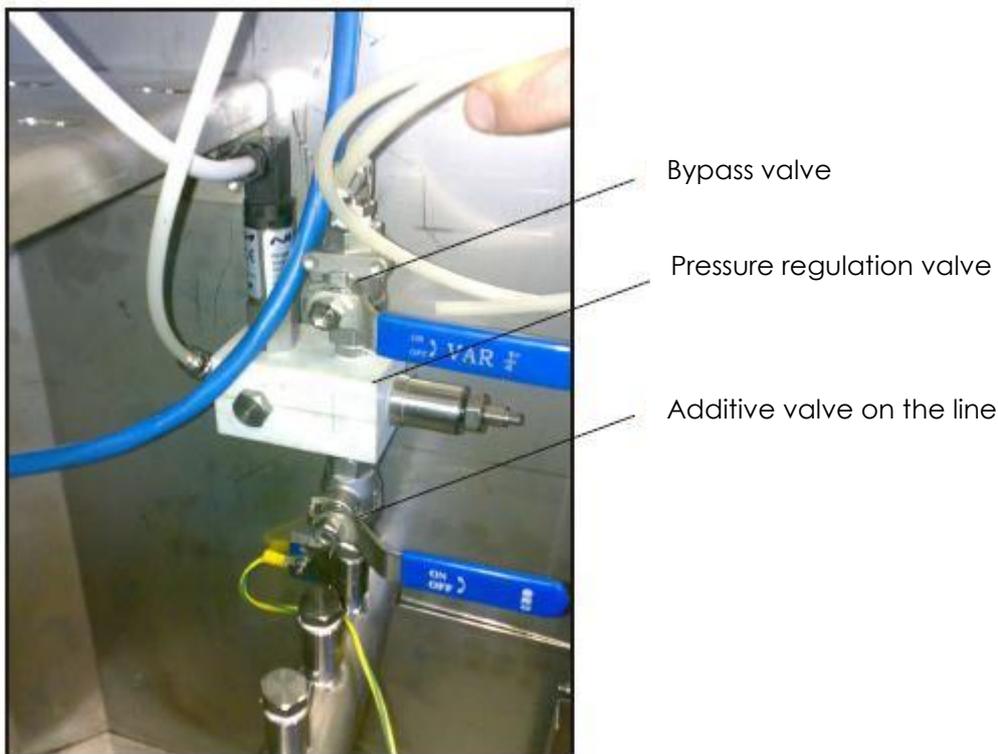


Fig.4

Maintenance

The only maintenance which the machine needs is that the connectors, valves and connections are kept in good condition. Check the level of lubricating oil inside the dosing pump.

Main causes of malfunctions

If the pump is being used but does not suck up the product, check:

- the valves are in the correct position.
- that the machine valves are not blocked because of not being used for a prolonged period when the machine is inactive or that the latter has not been cleaned.

Use hot water to restore the valves.

APPENDIX 1

KEY FUNCTIONS		
 ON	 UP MENU	 DECREASE
 OFF (press for 4 s)	 DOWN MENU	 INCREASE
 AUTOMATIC	 MANUAL	 DISTRIBUTOR
 CLEAR	 UNIT OF MEASUREMENT	 MANUFACTURER
 ESCAPE	 ENTER	 FAST

PROGRAMMING SEQUENCE	
 INCREASE FAST	 DECREASE FAST
 ACTIVATE	 DEACTIVATE
 VIEW FIRMWARE VERSION AND E DATE	
 PROTECTED VOICES ENTRY SEQUENCE	

APPENDIX 2

WORK PROGRAMME

Turn on the electronics by pressing the ON button. The work screen looks like this:

MAIN FLOW	000 . 00
ADDIT . FLOW	000 . 00
% ADDITIVE	00 . 00
-MAN- ERR-%	-ABIL-

1) MANUAL OPERATION

Press MAN. The word MAN will appear on the left.

Select the additive flow with the + or – and FAST key.

To cancel the value, simultaneously press the + or - keys and the FAST key.

N.B.: as soon as you do this, the pump will start to measure the liquid, even if the main flow has not been activated yet!

2) PROGRAMME THE PERCENTAGE

Press AUT and select the value of the percentage of additive which will be added with the + and - keys.

3) AUTOMATIC OPERATION

Press AUT.

Simultaneously press the FAST and ON keys to activate the machine.

The dosage of additive will be activated as soon as the flow of the main product has begun.

To stop dosing press FAST and OFF (deactivate) or on MAN.

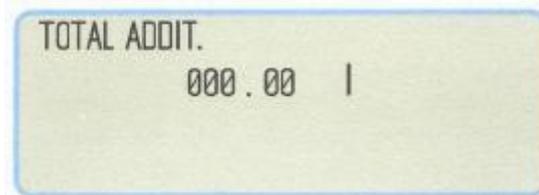
4) RESET THE PARTIAL TOTALISERS

On the work screen, press DOWN. The screen will show:

SETTINGS
Total main
000 . 00 mc

Press the CLEAR key and hold it down until the value is cancelled.

With the DOWN key, view the screen:



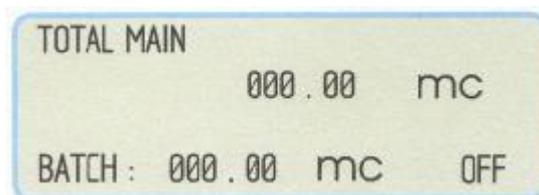
Press the CLEAR key and hold it down until the value is cancelled.

Press the UP key twice to return to the main page.

5) BATCH PROGRAMMING

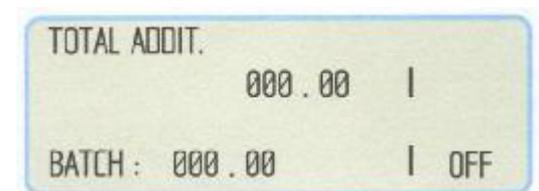
As soon as you are on the work screen, press the FAST and ON keys to activate the electronics (the word ABIL. will appear on the screen). Press the AUT key.

Press DOWN to view the screen:



Select the quantity of the main product with the + and - keys.

Press DOWN to view the screen:



Select the quantity of additive with the + and - keys.

To start dosing, the system must be activated.

Cancel the previous value with the CLEAR key.

Press ON to start dosing (closed contact on terminal 19)

As soon as the batch is finished, contact 19 will reopen and the message will

appear on the screen.

APPENDIX 3

FLASHING ALARM SIGNALS

ERR-%

EXCESSIVE PROGRAMMING OF THE DOSAGE PERCENTAGE

- Repeat the programming.

FLOW

ABSENCE OF FLOW

- Lack of fluid.
- Damaged pump or flow meter.
- There is air in the pump suction system.

PRESSURE

MINIMAL OR MAXIMUM PRESSURE IS OUTSIDE THE PARAMETERS

- Lack of fluid.
- Damaged pump or SENSOR.
- There is air in the pump suction system.
- Open discharge valve.
- Blocked counter pressure valve
- Excessive viscosity of liquid.

N.B.

When this alarm appears, you need to stop operating and check what has caused the problem. If a calibration or programming error persists, you need to update the machine. Contact the technical assistance department.

APPENDIX 4

CLEANING PROCEDURE

1. CLEANING, DISINFECTION AND RINSING

1) Rinse the outside of the gum suction pipe with hot water (40 °C).

- Put the suction pipe in a container of hot water.
- Press the ON key (turn on).
- Select the manual mode by pressing the MAN key.
- Check that the valve that goes to the main line is closed and that the bypass valve is open.
- Press the + and FAST keys and select a value of approximately 6 l/hour.

Let the water circulate for 5 - 6 minutes.

2) Clean with the detergent solution (2% VINO DET L) for 5 minutes, in the same way as the previous rinse.

3) Rinse again with warm water (40°C) for 5 - 6 minutes, in the same way as before, and check that the rinsing has been done correctly.

To check that the rinsing is correct: add four drops of phenolphthalein in a test tube which contains the rinsing water and check the colour:

- COLOURLESS: the rinse is correct. You can finish.
- PINK: the rinse is not sufficient and you must continue.

4) Regularly (recommended every day) run a disinfection cycle as follows:

- Circulate a disinfectant solution for 10 minutes (follow the same procedure referred to in point 1).
- Rinse thoroughly with warm water (follow the same procedure referred to in point 1).

To verify that the rinse is correct: add four drops of bromothymol blue in a test tube which contains the rinsing water and check the colour:

- GREEN: the rinse is correct. You can finish.
- BLUE: the rinse is not sufficient and you must continue.

1.1. PRODUCTS AND DOSAGES

1.1.1. Detergent

2 % alkaline solution (200 mL of product in 10 litres of water).

1.1.2. Disinfectant

0.5% peracetic acid with hydrogen peroxide (20 mL of product in 10 litres of water).

1.2. FREQUENCY OF CLEANING

- After operating the machine.
- When you want to use the machine after a long period of inactivity.

2. BLEEDING

To bleed the dosing pump, the procedure is the same as for cleaning and rinsing:

- Press the ON key (turn on).
- Select the manual mode by pressing the MAN key.
- Check that the valve that goes to the main line is closed and that the bypass valve is open.
- Press the + and FAST keys and select a value of approx. 6 l/hour.

Let the circulate water for 5 - 6 minutes.

3. SUCTION PIPE MAINTENANCE

We advise keeping the suction pipe filter in a plastic bag with a cloth dipped in alcohol.

IMPORTANT: IF THE PREMISES GET FILLED WITH STEAM, REMOVE OR PROTECT THE MACHINE TO AVOID PROBLEMS WITH THE SOFTWARE