EN

ESPRESSO COFFEE MACHINE

Use and maintenance manual for the TECHNICIAN

WEGA® MACCHINE PER CAFFÈ

MININOVA

Index

ENGLISH

A General Warnings

The manufacturer of the equipment cannot be held responsible for damage caused by failure to oblige to the requirements below.

B Warnings for the installer

- Read this manual carefully. It provides important information on safe installation, operation and maintenance of the equipment;
- Installation, conversion to other type of gas, and maintenance of the equipment must be carried out by personnel qualified and authorized by the manufacturer, in compliance with safety regulations and instructions included in this manual;
- identify the model of the equipment. The model is shown on the packaging and on the nameplate of the machine;
- Install the equipment only on sites where there is good ventilation;
- Do not obstruct the ventilation and exhaust holes on the machine;
- Do not tamper with the equipment components.

! **At the end of the installation, the installer has to fill the "Installation Card" carryed out with the machine. On this form must be confirmed the conditions provided by hygiene and safety regulations in the place of installation and must be reported notes about changes and modification due to a correct function of the machine.**
Copies of "Installation Card" must be kept by the user and installer until the end life of the machine. In case of withdrawal of the machine, the installer must provide for the withdrawal of the "User's Installation Card".

B.1 Power

The water supply of the appliance must be carried out with water which is suitable for human consumption, in compliance with the regulations in force int the place of installation. The owner / manager of the system must confirm to the installer that the water meets the above listed requirements.

B.2 Materials to be used

During the installation of the appliance the components and materials that were provided with the appliance are to be used. Should the use of other components be necessary, the installer must verify their suitability to be used in contact with water used for human consumption.

B.3 Hydraulic connections

The installer must carry out the hydraulic connections in accordance with the hygiene norms and the hydraulic safety norms for environmental protection in force in the place of installation.

B.4 Activation

When installation is complete, the appliance has to be started, brought to the nominal working condition and left for 30 minutes in the "ready to operate" condition.

Afterwards, the appliance has to be turned off and emptied of the first water introduced in the whole hydraulic circuit, to eliminate possible initial impurities.

Then the appliance must be once again loaded and brought to the nominal working conditions.

After having reached the "ready to operate" condition, the following deliveries have to be performed:

1. for each coffee group make a continous erogation to discharge all volume of water contained in each coffee tank combined;
2. release the whole volume of hot water inside the boiler by performing a continuous delivery from the appropriate nozzle. In the case of several dispensing points, divide the volume on the base of the number of the dispensing points;
3. continuously release steam for at least 1 minute for each steam dispensing point.

B.5 Maintenance and repairs

After ta maintenance and/or repair intervention, the components used must ensure that the hygiene and safety requirements initially foreseen for the appliance are still met. These are met by using original spare parts only.

After a repair or a substitution of components related to parts in direct contact with water and food, a washing procedure has to be carried out, as in the case of first installation.

! The user must be sufficiently informed to operate the appliance correctly. It is recommended not to carry out any operations on the machine which may modify or alter its operation. WHEN THE MACHINE IS OPERATING, THE BOILER CONTAINS STEAM AND HOT WATER UNDER PRESSURE.

! The machine's installation and maintenance operations can only be carried out by qualified technical personnel. Qualification can be provided by the builder through participation in specific training courses.

! The installation and maintenance of the machine must be carried out only by qualified service personnel with knowledge and practical experience of the machine itself, with particular attention to the safety aspects and hygiene.

C Typographical conventions

! This symbol indicates that you must strictly follow the instructions it refers to, in order to avoid damage to the appliance or injury.

i This symbol provides additional information on the operation of the machine and its components.

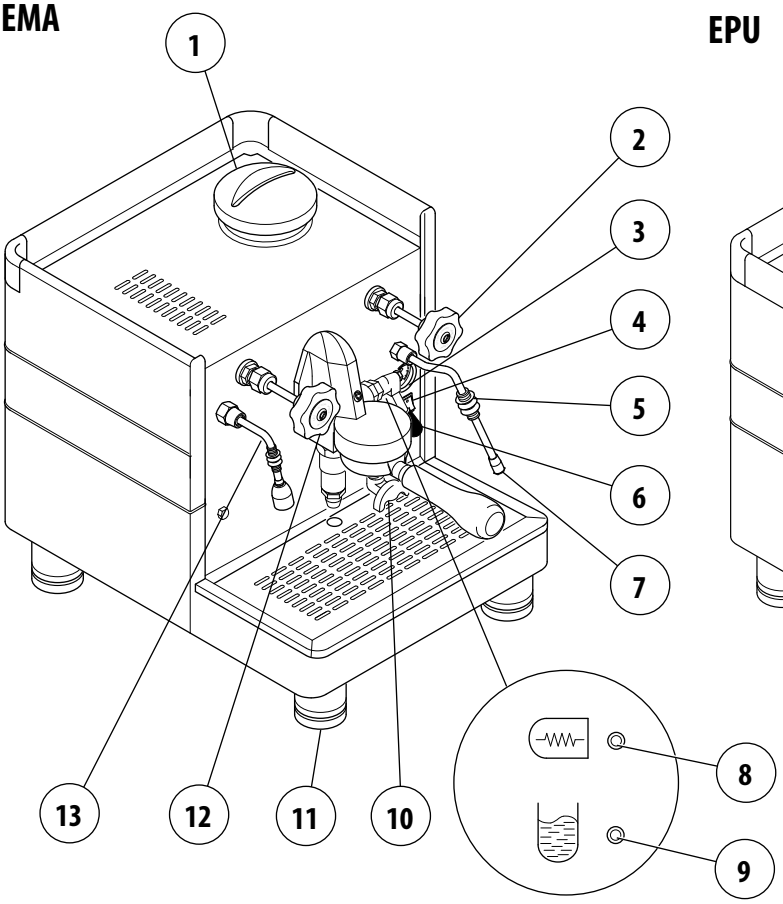
Section I - OPERATION

1 Technical characteristics

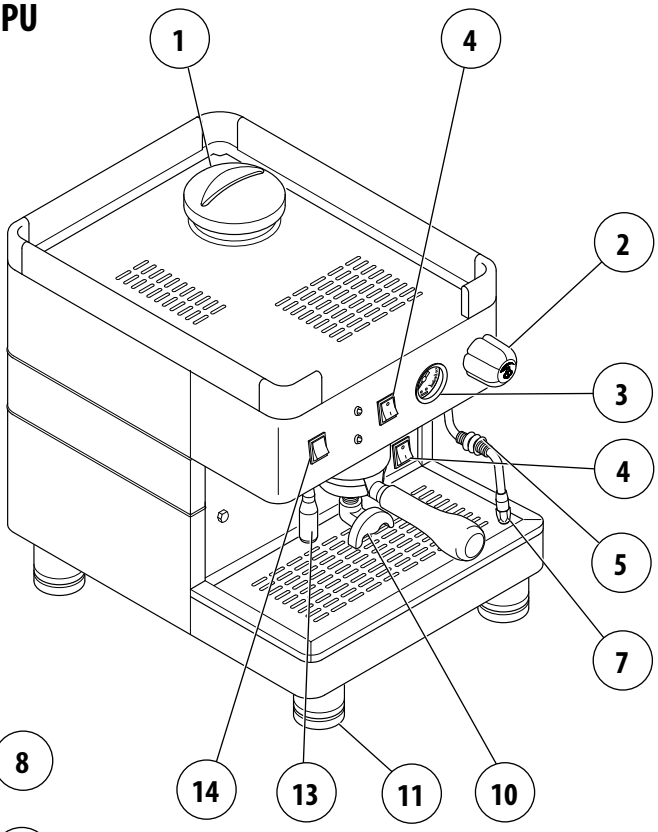
1.1 Internal components

VERSION 1GR

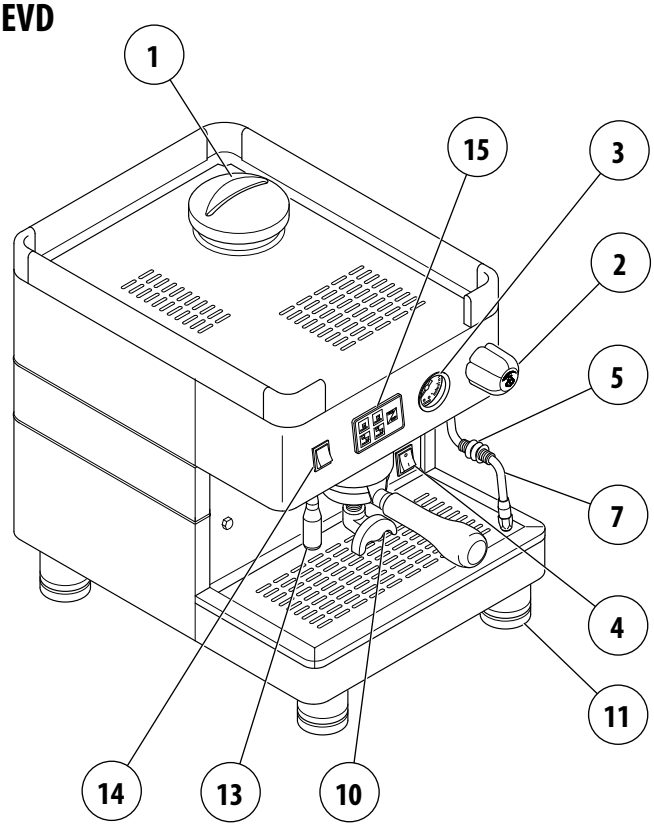
EMA



EPU

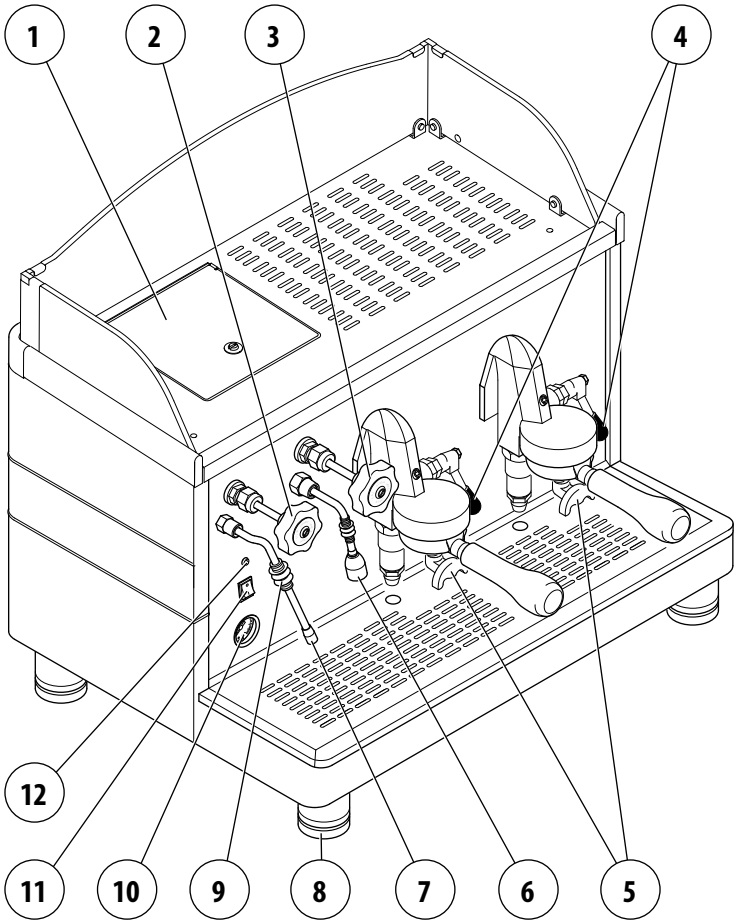


EVD



1. Water tank.
2. Steam knob.
3. Pressure gauge.
4. Machine main switch.
5. Anti-burn rubber.
6. Coffee dispensing lever.
7. Steam dispensing nozzle.
8. Boiler heating element indicator light working.
9. Light water level boiler.
10. Coffee dispensing spout.
11. Adjustable foot.
12. Hot water dispensing knob.
13. Hot water dispensing nozzle.
14. Hot water dispensing button.
15. Push button panel.

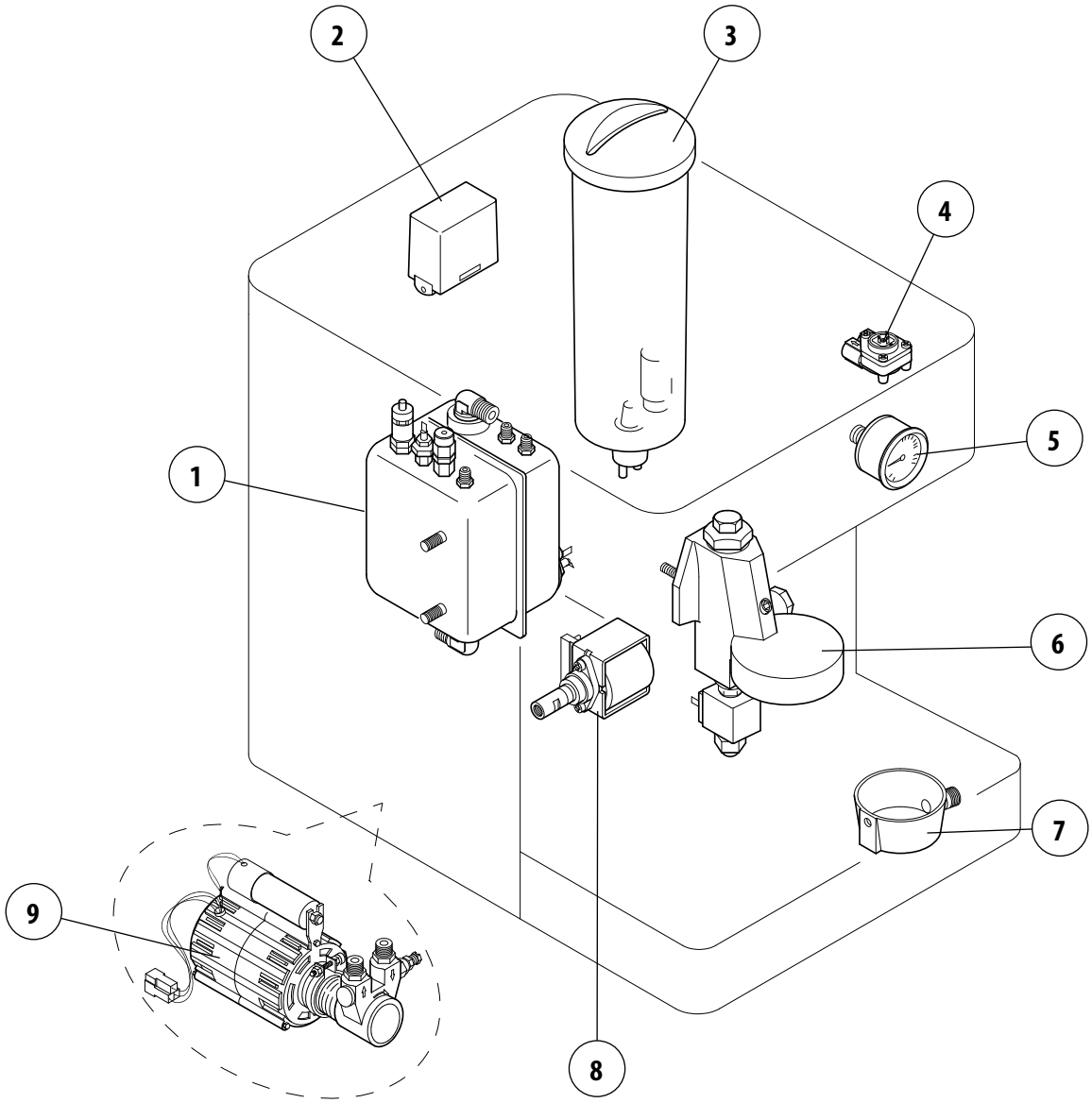
VERSION 2GR EMA



1. Water tank.
2. Steam Knob.
3. Hot water dispensing knob.
4. Coffee dispensing lever.
5. Coffee dispensing spout.
6. Hot water dispensing nozzle.
7. Steam dispensing nozzle.
8. Adjustable foot.
9. Anti-burn rubber.
10. Pressure gauge.
11. Machine main switch.
12. Warning light.

1.2 Internal components

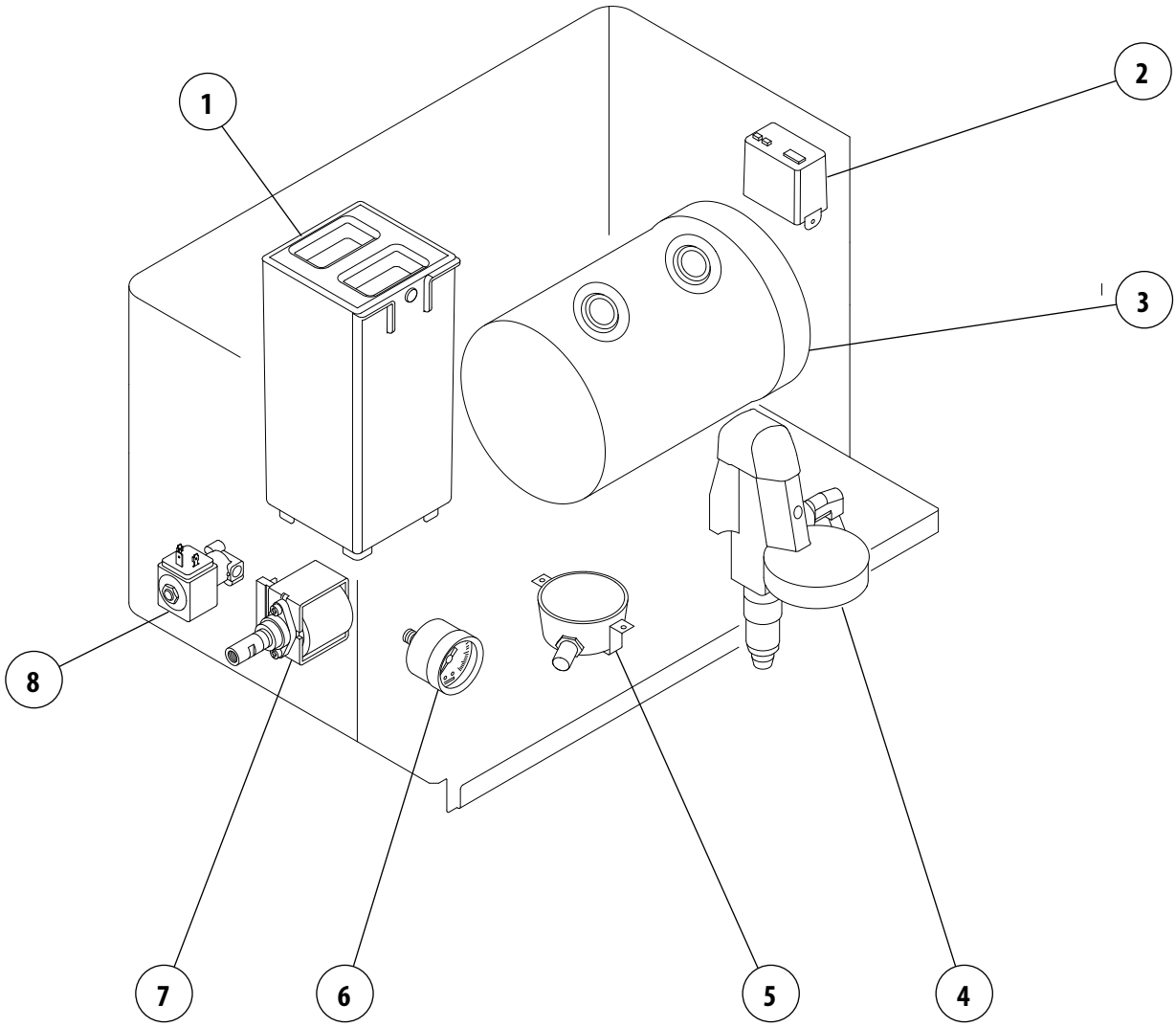
VERSIONS 1GR EMA-EPU-EVD



1. Boiler.
2. Electronic control unit.
3. Water tank *(*)*.
4. Volumetric dosing device.
5. Boiler pressure gauge.
6. Dispensing group.
7. Drain pad.
8. Internal vibration pump.
9. Internal motorpump *(*)*.

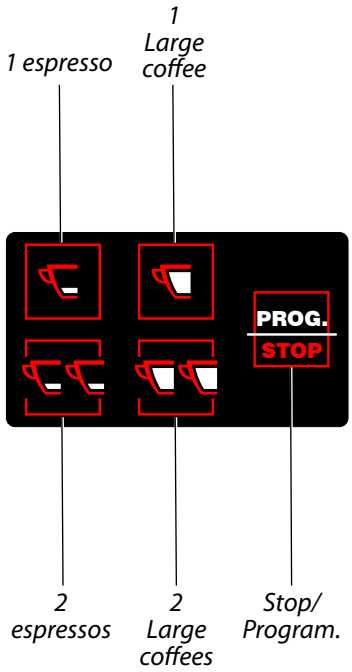
(*) optional

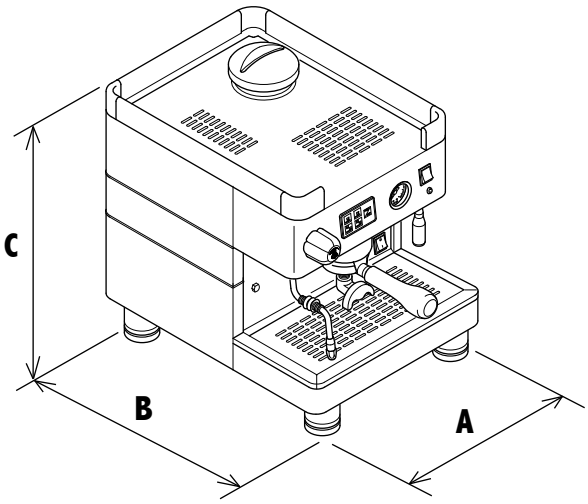
VERSION 2GR EMA

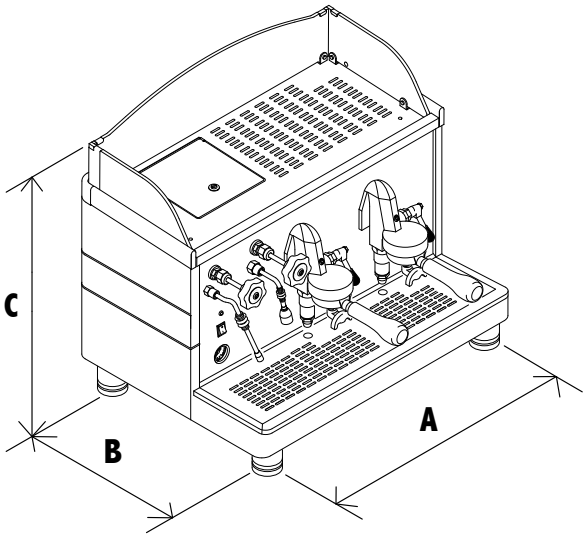


1. Water tank.
2. Electronic control unit.
3. Boiler.
4. Dispensing group.
5. Drain pad.
6. Pressure gauge.
7. Vibration pump.
8. Solenoid valve.

1.3 Push button panel Mininova 1GR Version EVD







1.4 Technical data

The nameplate of the machine is fixed on the base of the frame under the drain pan.

	1GR			2GR
Boiler capacity (lt)	2 lt			4lt
Power supply voltage (V)	120 V	230 V	240 V	230/240
Power (W)	1270 W	1570 W	1710 W	2.850
Frequency (Hz)	50-60 Hz			50-60 Hz
Boiler pressure (bar)	1,4 bar MAX			1,4 bar MAX
Safety valve calibration (bar)	2 bar			2 bar
Supply water pressure (bar)	1,5 - 5 bar			1,5 - 5 bar
Coffee dispensing pressure (bar)	8 - 9 bar			8 - 9 bar
Operational conditions (°C / °F)	5-40 / 41-104 °C / °F			5-40 / 41-104 °C / °F
Net weight with internal motorpump (kg)	30 kg			n/a
Net weight with vibration pump (kg)	27 kg			46 kg
Internal water tank capacity (lt)	2 lt			4 lt
Widht (A) (mm)	335 mm			532 mm
Depht (B) (mm)	440 mm			445 mm
Height (C) (mm)	Standard groups	430 mm		430 mm
	Raised groups	470 mm		n/a

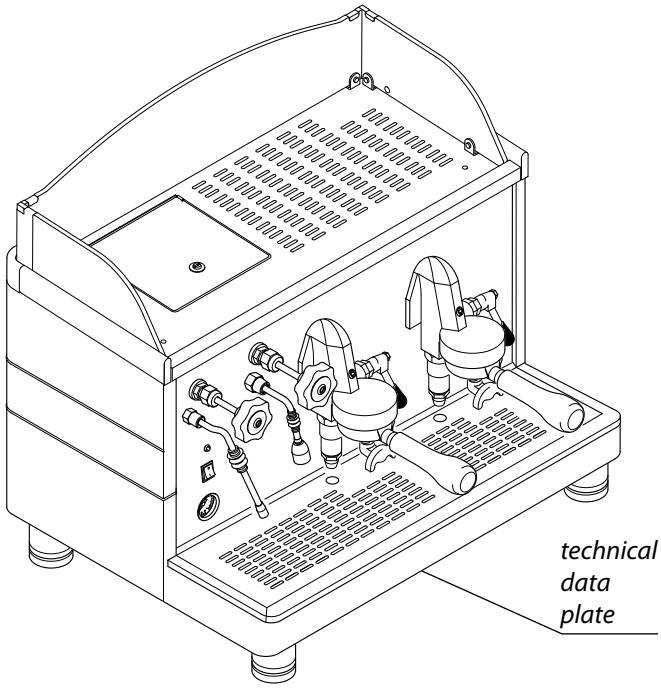
2 Preparation

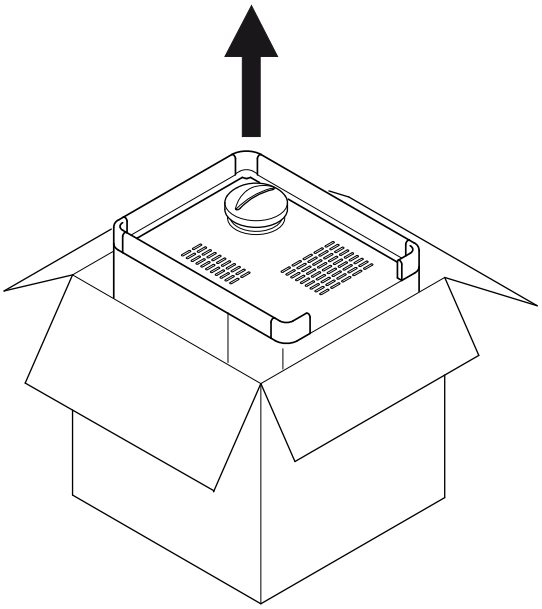
2.1 Unpacking the machine

Open the packaging, ensuring not to damage the machine.

Remove the machine protections and the equipment contained in the package. Take the machine out.

If there is an external motor pump, the motor and the pump are provided in a separate package.





All technical data are indicated on the technical data plate.
The detais of the equipment are also reported on the label located on the packaging of the machine.

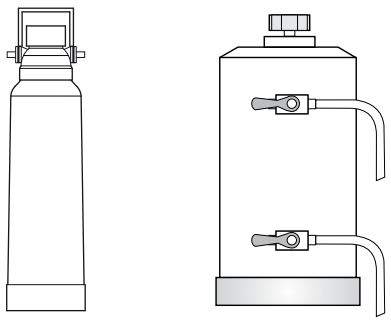
Handling operations must be performed by at least 2 persons or with the aid of suitable lifting accessories.

Considering the significant weight of the equipment, use extreme caution in handling and use safety gloves.

2.2 Equipment preparation

Softener

On request, an automatic resin softener is supplied. For further information, refer to chapter "Softeners".

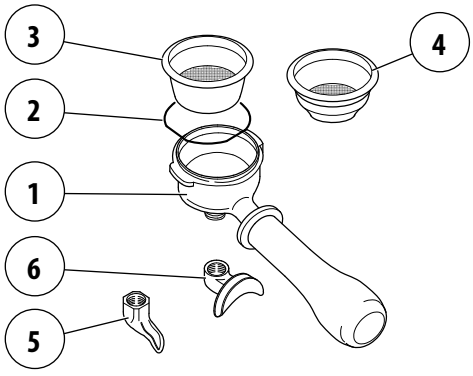


Filter holder

In the housing of the filter holder (**1**) place the spring to stop the filter (**2**). Take the two cups (**3**) or one-cup (**4**) filter and press it firmly into the filter holder.

Spouts

Complete the filter holder by installing the 2 cups (**6**) or one-cup (**5**) spout.



Install the spout with relative filter: one-cup spout on one-cup filter holder or with one-cup filter, etc...

Motor pump (only for version 1GR)

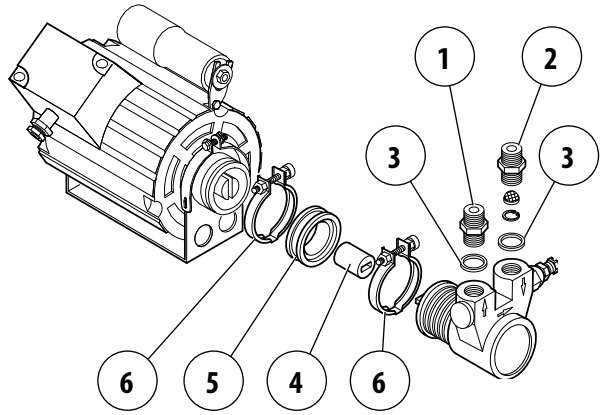
For the machines with an external motor, it is necessary to prepare the pump and the motor.

Assemble the 3/8 gas connection with the inlet filter (**2**) of the pump (arrow ⬇) and the plain 3/8 outlet gas connection (**1**) of the pump (arrow ⬆).

Use the special washers (**3**) provided for sealing purposes.

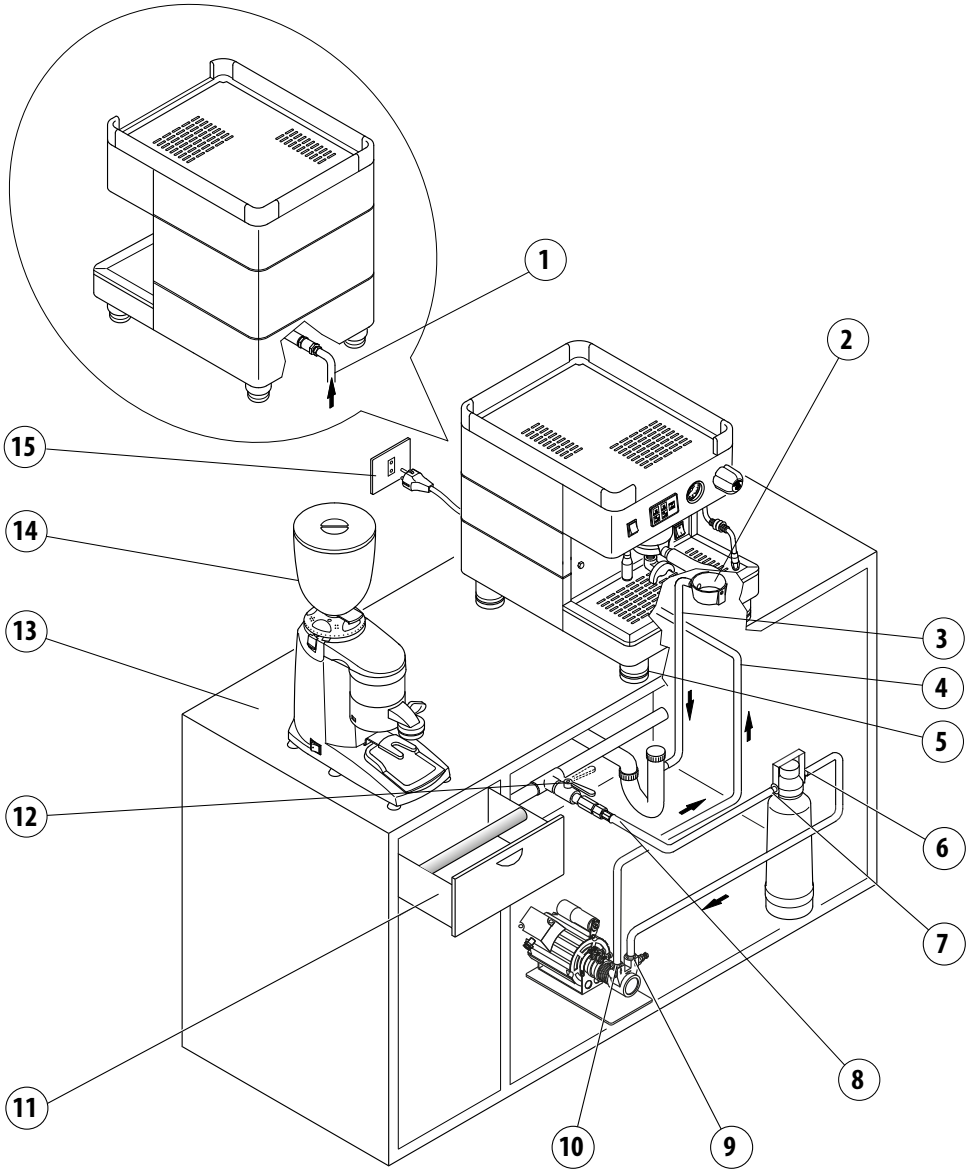
To correctly couple the pump and motor, use the appropriate joint (**4**) and the spacer ring (**5**), lock everything with the two clamps (**6**).

The pump and motor joint has to be installed also on the machines with an internal motor pump.



Install the connection with the inlet filter (2) of the pump (arrow ⬇).

3 Machine installation



3.1 Positioning

Prepare an ample support base for the machine that is suitable to support its weight (**13**); It is important for all terminals of connections to the water mains (**8**) and to the electrical mains (**15**) to be easily reachable and in any case in the immediate vicinity of the machine.

Make sure that there is sufficient space for placing and correctly using the appliance. When positioning the machine close to the wall, you have to ensure a minimum distance of 20 cm between the machine and the wall.

The grinding-dosing machine (**14**) must be placed in the immediate vicinity of the appliance in order to allow for comfortable use of the machine. It is advisable to equip the working base of the machine with a drawer (**11**) for used coffee grounds, preferably with a rubber device for tapping the filter holder.

Place the motor pump (**10**) (only for version 1GR) in a protected area with no humidity and away from accidental contact with the operator.

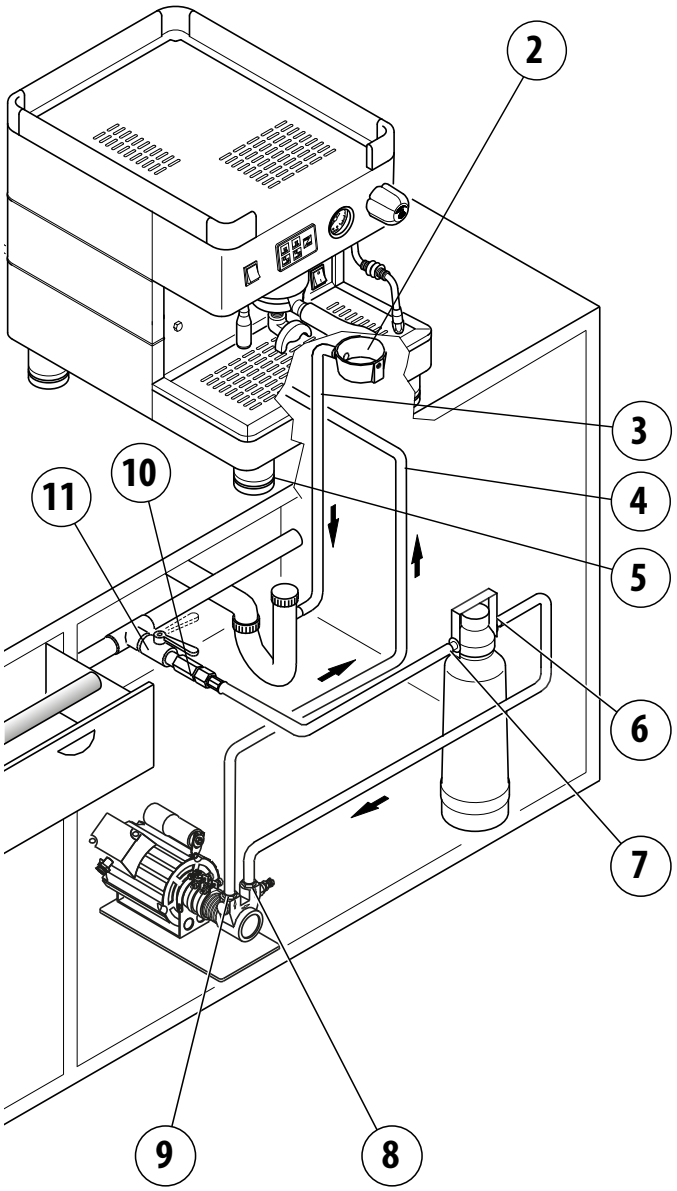
! In case of installation of the machine in motion environments (ships, trains, etc.) it's necessary to use special feet, to be anchored on the support base, available from the manifacturer.

! For correct operation, the machine must rest on a perfectly horizontal surface. Any alignment of the machine must be done by adjusting the feet (5).

3.2 Hydraulic connection (version with hydraulic connection available)

If the machine is available to be connected up to the water, follow the instructions below:

1. Connect the water supply (**10**) to the softener inlet (**7**) using the provided flexible hose;
2. connect the softener outlet (**6**) to the external motor pump inlet (**8**);
3. connect the outlet of the motor pump (**9**) to the inlet of the machine (**4**);
4. connect the drain pad of the machine (**2**) to the sewer discharge (**3**) using the special hose provided, avoiding overly tight bends or kinks, and making sure that there is sufficient inclination for water to drain.



Warnings

1. The water supply must provide cold water for human consumption (potable water) at a pressure between 1,5 and 5 bars. If the pressure is higher than 5 bar, connect a pressure reducer before the pump.
2. add a tap (**11**) to the water supply so as to stop water from flowing to the machine;
3. in order to prevent damage, it is advisable to install the softener where it will be protected from accidental blows;
4. to prevent water from freezing, install the softener inside a premise with a room temperature higher than 5°C;
5. if there is no softener, connect the water supply (**10**) directly to the inlet of the external motor pump (**8**);
6. if there is an internal motor pump, connect the outlet of the softener (**6**) (if there is one) or the water supply (**10**) directly to the machine inlet (**4**);
7. when connecting the pad of the machine to the sewer drain, avoid overly tight curves or kinks, and make sure that there is sufficient inclination for water to flow out of the drain;
8. the drain must be connected to an inspectable siphon that can be periodically cleaned, in order to avoid bad odours;
9. to avoid oxidization and damage to the machine over time, do not use iron connections for the hydraulic system, even if galvanized.

All filling connections are 3/8 male gas type. The drain pan is connected to a tube with an internal diameter of 16 mm.

All of the machine are equipped with a "Time-out" device that allows filling of water in the boiler within a maximum time. This function keeps water from flowing out of the boiler's valve (flooding) and keeps the motor pump from overheating. If the time limit is not enough for the boiler to fill up completely (such as for the machines installed with 3 or 4 groups), turn the machine off and then back on, and repeat the operations listed above.

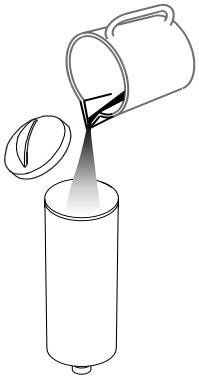
The water supply of the appliance must be carried out with water which is suitable for human consumption, in compliance with the regulations in force in the place of installation. The installer must receive, from the owner/manager of the system, confirmation that the water meets the above listed requirements.
In case of supply from the tank, don't use carbonated water or other liquids.

The hydraulic connection must be made in compliance with local national standards. In case of use of an external tank: the connection hose between the machine and the tank can't be longer than 150 cm. For the European Community: both for the hydraulic connection to the water supply, and for the connection to an external tank, it is necessary to place a non-return valve (10) on the machine as set forth by EN 1717 standards.

FOR THE U.S.A.
The water connections and discharges must be made in accordance with the 2003 International Plumbing Code of the International Code Council (ICC), or with the 2003 Uniformed Hydraulic Code of the IAPMO. The machine must be installed together with an adequate non-return valve, as required by national regulations.

During the installation of the appliance, only the components and materials supplied with the appliance are to be used. Should the use of other components be necessary, the installer must verify their suitability to be used in contact with water used for human consumption. The installer must carry out the hydraulic connections in accordance with the hygiene norms and the hydraulic safety norms for environmental protection in force in the place of installation.

3.3 Hydraulic connection (version with inner tank)

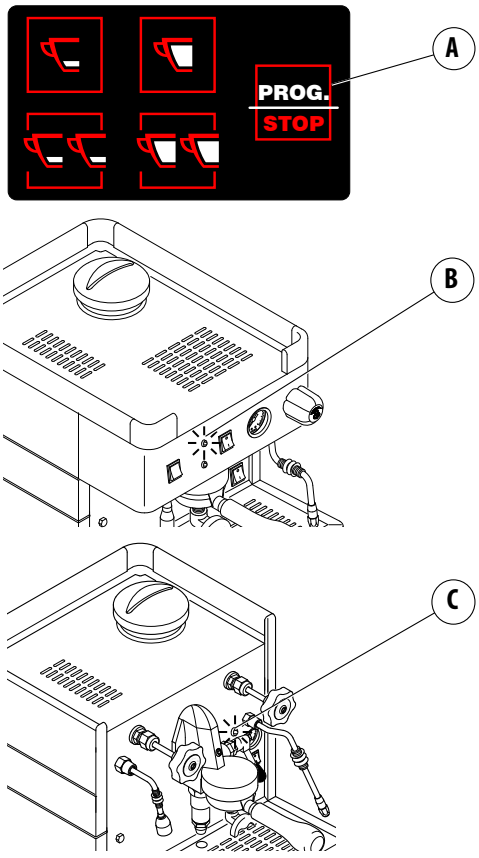


In inner tank version the operations of connection to the aqueduct are not necessary as the water is supplied from the tank inside the machine.

The possible lack of water in the tank is indicated by the flashing led of the **STOP/PROG.** (**A**) button for EVD model or by the warning light in specific patterns EPU (**B**) and EMA (**C**).

If the machine is ready to connect to the aqueduct, follow the instructions below:

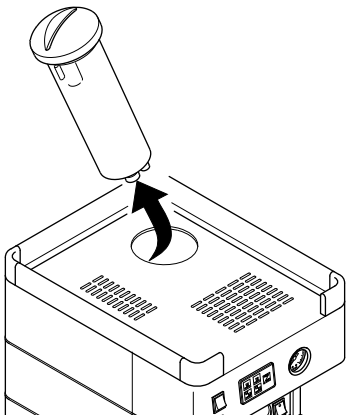
1. Connect the water supply (**10**) to the entrance of the water depuration filter (**7**) using the supplied flexible hose;
2. connect the output of the water filter (**6**) to the entrance of the external motorpump (**8**);
3. connect the exit of the motorpump (**9**) alto the entrance of the machine (**4**);
4. connect the drain pain of the machine llegare la vaschetta di scarico della macchina (**2**) to the sewage system allo scarico fognario (**3**) using the supplied hose, taking care to avoid sharp bends or kinks and keeping a sufficient slope to drain water discharge.



To restore the level of liquid is sufficient to remove the tank cover and add water.

It is recommended to clean the tank periodically as follow:

1. Extract the tank from its housing;
2. carefully wash the tank with lukewarm water;
3. fill the tank with potable water;
4. place the tank correctly in place.



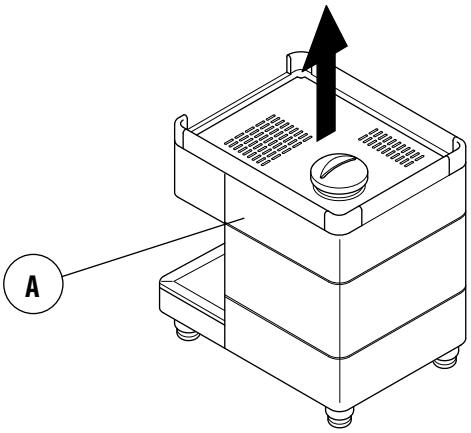
Fill the tank only with cold potable water. Do not use other types of liquids or carbonated beverages. Operating without water may damage the machine.

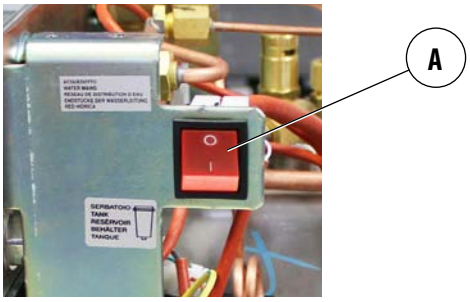
3.4 Conversion from TANK to WATER MAINS 1GR Version

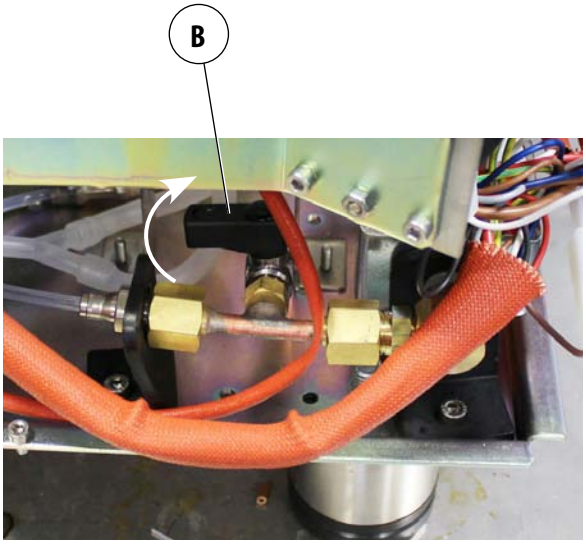
Through this procedure you can change the type of water supply of the machine, from internal Tank to Water Mains.

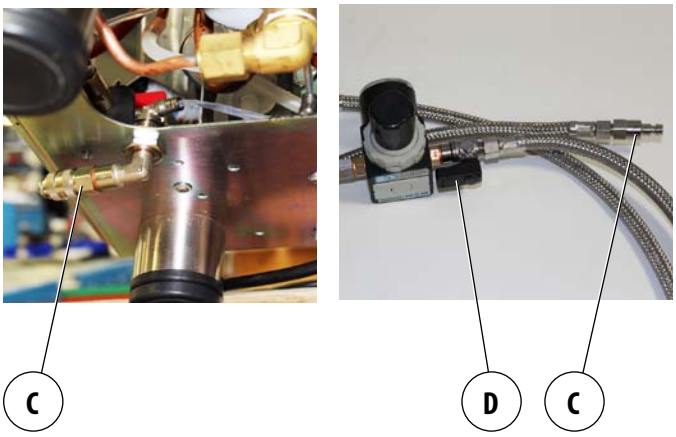
All operations must be performed by technical personnel only.

- Unplug the machine from the power supply.
- remove the water tank;
- remove the screws, and then remove the top cover and the body of the machine;
- set switch (**A**) placed on the right side of the machine to "**0**";
- turn the knob (**B**) clockwise to end of stroke, so that its direction is the one shown in the picture;
- replace the body of the machine using the screws;
- replace the water tank;
- hook the hose (**C**) supplied to the quick coupling placed under the machine;
- connect the hose to the water supply and open the tap (**D**), make sure that the system pressure is about 1 bar;
- connect the cable to the power supply and turn on the machine.







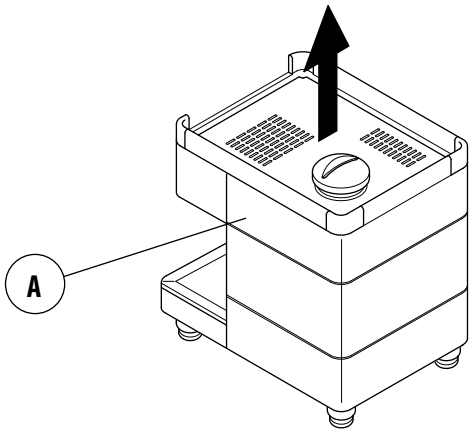


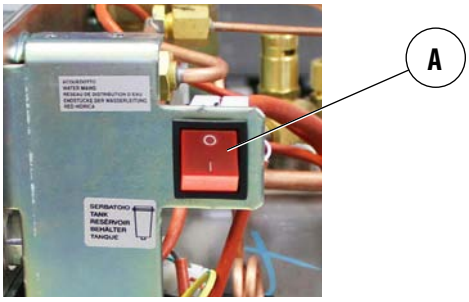
3.5 Conversion from WATER MAINS to TANK 1GR Version

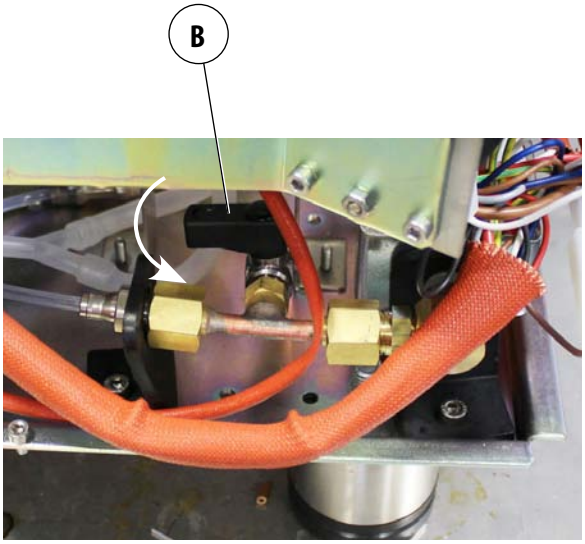
Through this procedure you can change the type of water supply of the machine, from Water Mains to internal Tank.

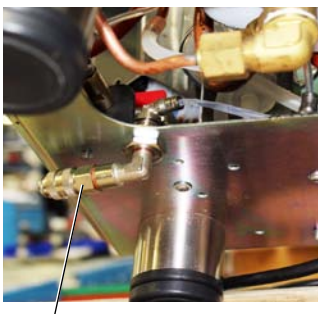
All operations must be performed by technical personnel only.

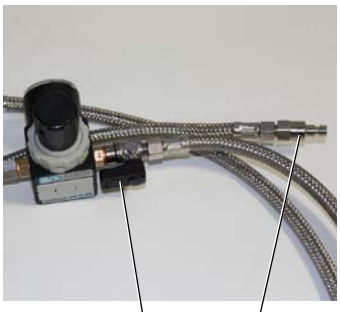
- Unplug the machine from the power supply.
- close the tap (**D**) and disconnect the hose from the water supply;
- unhook the hose (**C**) from the quick coupling placed under the machine;
- remove the water tank;
- remove the screws, and then remove the top cover and the body of the machine;
- turn the knob (**B**) counter-clockwise to end of stroke, so that its direction is the one shown in the picture;
- set switch (**A**) placed on the left side of the machine to "**1**";
- replace the body of the machine using the screws;
- replace the water tank;
- fill the internal tank with potable water;
- connect the cable to the power supply and turn on the machine.









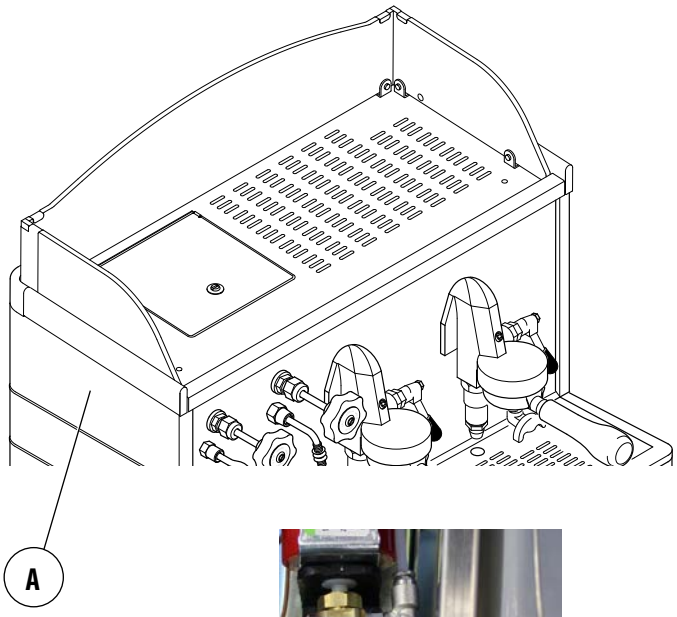


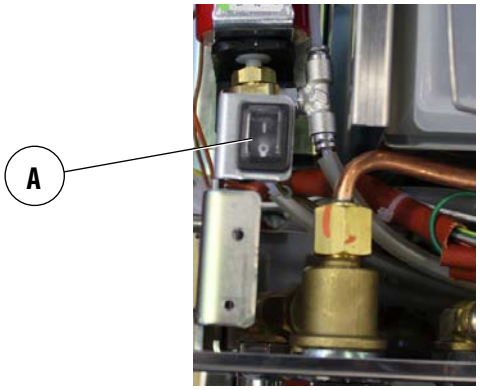
3.6 Conversion from TANK to WATER MAINS 2GR Version

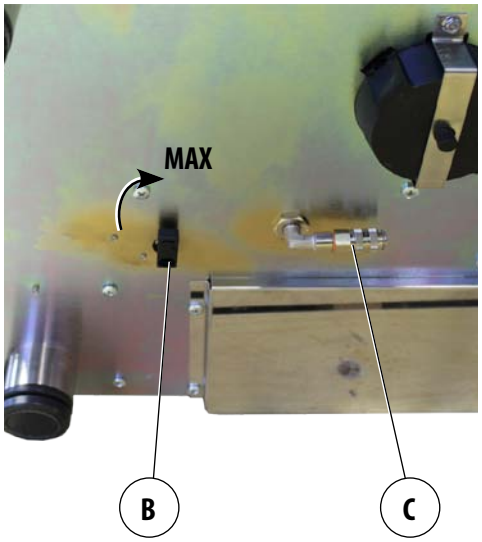
Through this procedure you can change the type of water supply of the machine, from internal Tank to Water Mains.

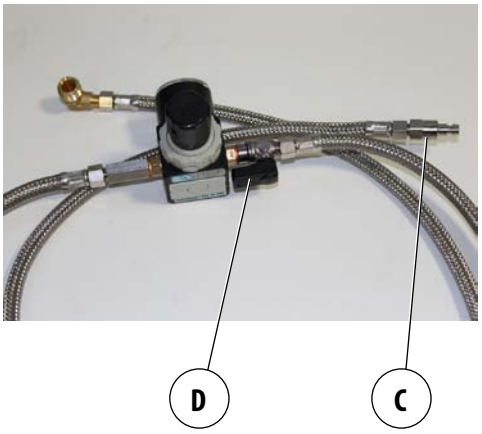
All operations must be performed by technical personnel only.

- Unplug the machine from the power supply.
- remove the screws and the top cover of the machine;
- set switch (A) placed on the left side of the machine to "**1**";
- replace the top cover of the machine using the screws;
- insert the knob (B) fitted under the machine and turn it clockwise (machine seen from below), all the way down, so that its direction is as shown in the picture;
- remove the knob and keep it for any future intervention;
- hook the hose (C) supplied to the quick coupling placed under the machine;
- connect the hose to the water supply and open the tap (D), make sure that the system pressure is about 1 bar;
- connect the cable to the power supply and turn on the machine.







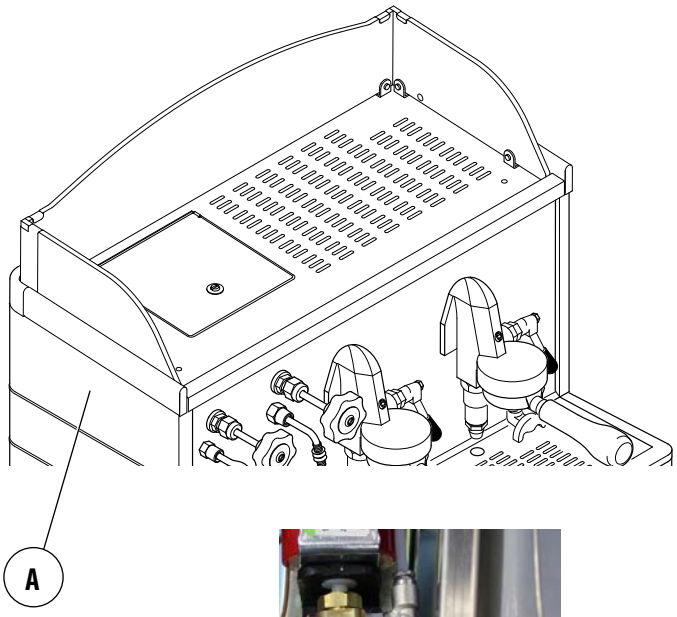


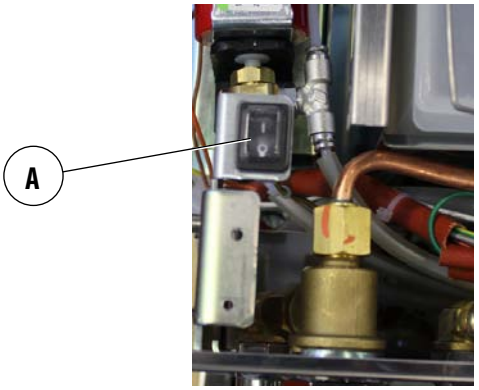
3.7 Conversion from WATER MAINS to TANK 2GR Version

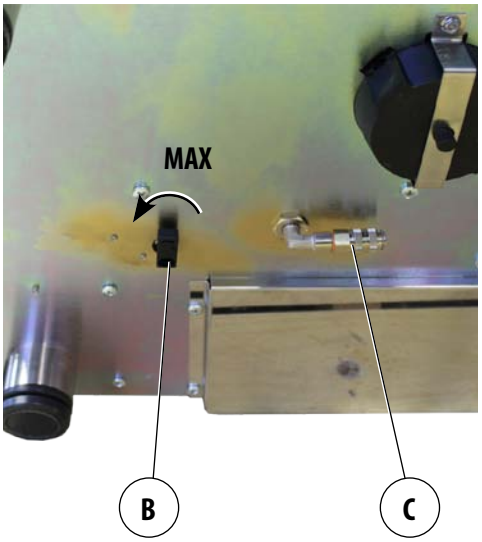
Through this procedure you can change the type of water supply of the machine, from Water Mains to internal Tank.

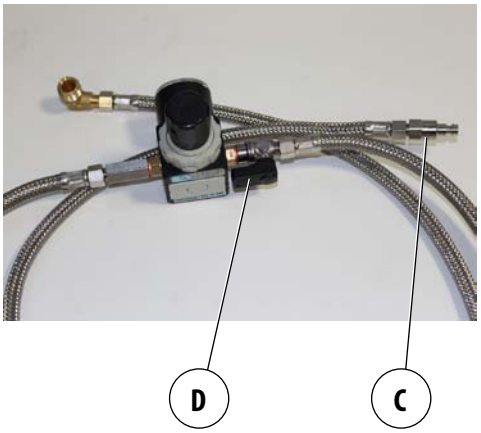
All operations must be performed by technical personnel only.

- Unplug the machine from the power supply.
- close the tap (**D**) and disconnect the hose from the water supply;
- unhook the hose (**C**) from the quick coupling placed under the machine;
- insert the knob (**B**) fitted under the machine and turn it counterclockwise (machine seen from below), all the way down, so that its direction is as shown in the picture;
- remove the knob and keep it for any future intervention;
- remove the screws and the top cover of the machine;
- set switch (**A**) placed on the left side of the machine to "**0**";
- replace the top cover of the machine using the screws;
- fill the internal tank with potable water;
- connect the cable to the power supply and turn on the machine.

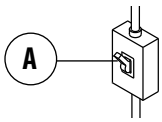








3.8 Wiring



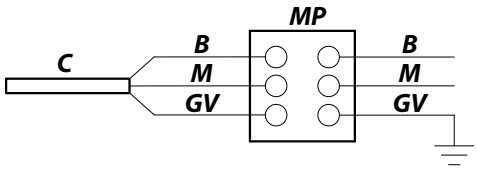
It is necessary to link a safety main switch (**A**) on the electric panel, as required by standard regulations.

Machine with INTERNAL MOTOR PUMP

Connect the power cable as set forth in the chapter "Electrical diagrams" (the cable has a cross-section and number of wires based on the power and voltage of the machine).

Machine with EXTERNAL MOTOR PUMP

1. Connect the motor pump cable (with smaller cross section) to the connector of the external motor as shown in the diagram below.
2. Connect the machine power cable (with larger cross section) as set forth in the "Wiring diagrams" chapter.



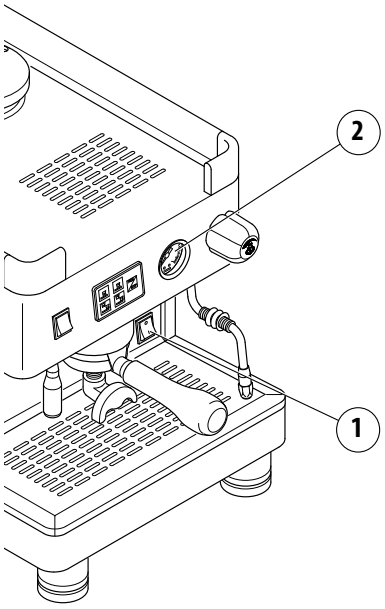
C Motor pump power cable
MP Motor pump terminal
B Blue
M Brown
GV Yellow-green

! Always connect the motor pump cable before the machine power supply cable, in accordance with the diagram provided. Failure to comply with the instructions given above may cause serious damage to the machine and/or motor pump and will invalidate the warranty. Carry out the electrical connections only when the machine is disconnected from the power supply.

3.9 Machine start-up

After getting equipped the water supply to the machine, turn the machine on using the main switch of the machine (**1**).

Before using the machine, wait for a short time (about 20 min.) until the gauge (**2**) indicates the correct working pressure (1-1.2 bars).



During the machine's warm-up phase (roughly 20 minutes), the negative pressure valve will release steam for a few seconds until the valve itself closes.

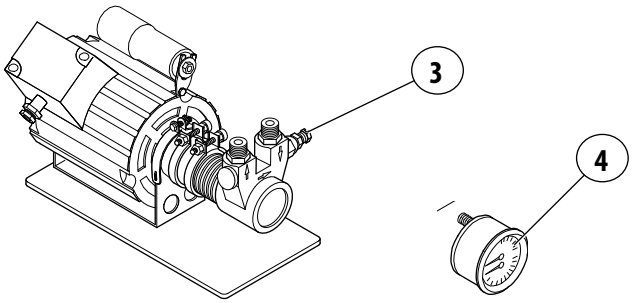
! PriBefore using the machine, run deliveries dry with the filter holfer attached for a few second to release any air which may be in the circuit, so that the delivery groups are completely heated.

Before using the machine, dispense a few servings of coffee to test the grinding and to check the operating pressure of the machine.

3.10 External motor pump adjustment (only version 1GR with external motor pump)

To adjust operating pressure proceed as follows:

- Operate a coffee delivery switch;
- adjust the pressure by turning the screw located on the pump (**3**) so as to obtain a value between 8 and 9 bar: tightening the screw increases the pressure, and loosening it reduces the pressure. Check the pressure on the pressure gauge (**4**) located in the front side of the machine;
- turn off the delivery switch.



3.11 Machine tune-up

When installation is complete, the appliance has to be started, brought to the nominal working condition and left for 30 minutes in the "ready to operate" condition.

Afterwards, the appliance has to be turned off and emptied of the first water introduced in the whole hydraulic circuit, to eliminate possible initial impurities.

Then, the appliance must be once again loaded and brought to the nominal working conditions.

After having reached the "ready to operate" condition, the following operations have to be performed:

1. for each coffee unit, carry out a continuous delivery, in order to release at least 0.5 liters of the coffee circuit. In the case of several dispensing points matched with the same exchanger/coffee boiler, divide the volume on the base of the number of the dispensing points;

2. release the whole volume of hot water inside the boiler (3 liters for 1GR, 5 liters for 2GR), by performing a continuous delivery from the appropriate nozzle. In the case of several dispensing points, divide the volume on the base of the number of the dispensing points;

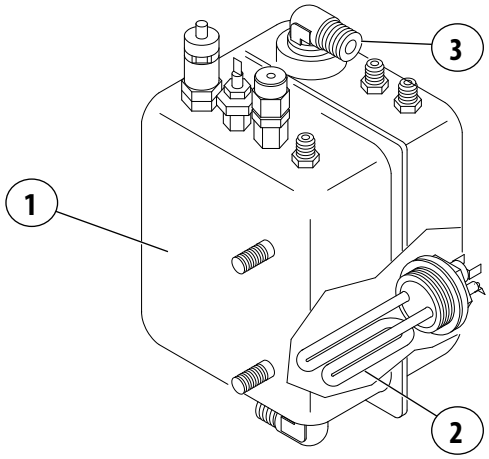
3. continuously release steam for at least 1 minute for each steam dispensing point.

4 Boilers

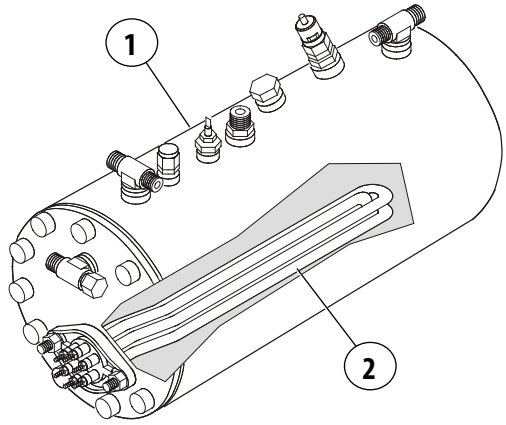
The boiler is constructed in steel (**1**) (version 1GR) or copper sheet metal (version 2GR) , to which the heat exchangers (**3**) are assembled which in turn are connected to the delivery group. During delivery, cold water is sent to the inside of the exchanger by means of the motor pump. Inside the heat exchanger, cold water and the pre-existing hot water are mixed, thus obtaining optimal water temperature for coffee infusion.

The water is heated in the boiler by means of an electrical heating element immerged in the water (**2**).

Version 1GR



Version 2GR



! Do not replace thhe heating element with a higher power one. Before making any modification contact the manufacturer.

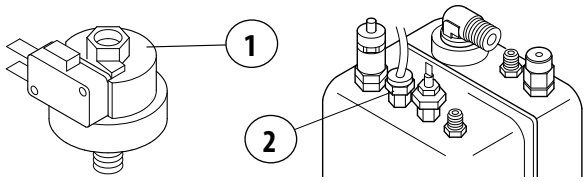
5 Control of the pressure in the boiler

Versions EMA - EPU:

The pressure switch (**1**) makes it possible to control boiler pressure by activating or bypassing the heating element in the boiler.

Version EVD:

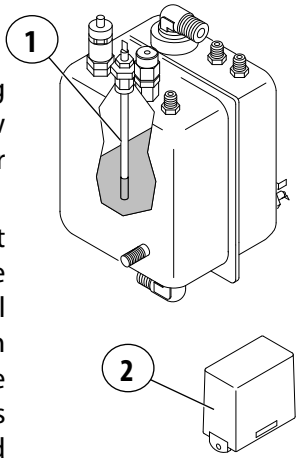
The pressure in the boiler is controlled by an appropriate NTC sensor place on the boiler (**2**). This sensor continously sends information to the electronic control unit, which as a result, active or less the heating element by using a power triac.



6 Automatic Water Entry

The Automatic Water Entry system is for checking the boiler level. It is composed of:

- level probe inserted in the boiler (**1**) composed of a stainless steel rod;
- electronic control unit (**2**);
- the pump allows the raising of the pressure of the inflow water at a pressure of 8-9 bar for the delivery.



The electronic control unit controls the water level in the boiler. When the water level drops down, the contact with the probe is interrupted, the electronic control unit sends a signal to the filling solenoid valve, which activates the motor pump and the filling solenoid valve, thus restoring the level of water in the boiler.

To avoid possible flooding due to machine malfunctions or leaks in the hydraulic circuit, the electronic control unit includes a timing device "Time-out" that cuts off automatic filling after a maximum operating time (2 minutes).

! In versions with the inner tank, the water lack is reported, in version EVD by the flashing of led STOP/PROG. of the push button panel or by the specific warning light in versions EMA-EPU.

ENGLISH

7 Coffee delivery groups

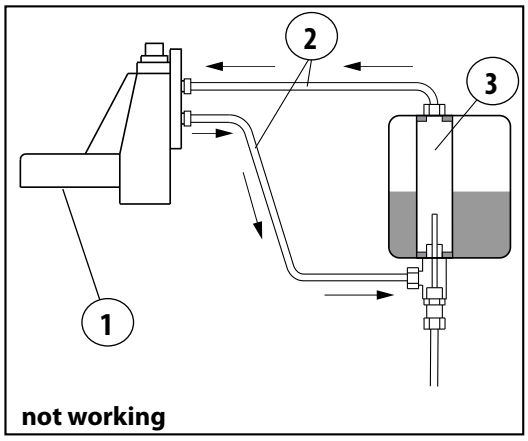
The delivery group and the heat exchanger are the fundamental components in obtaining espresso coffee,in particular, the function of the group is the coffee erogation.

In this system, the delivery group (**1**) is heated by a thermosiphon circuit (**2**) connected to the heat exchanger (**3**). The same water is used for the coffee delivery, thus ensuring the same temperature for all coffee servings:

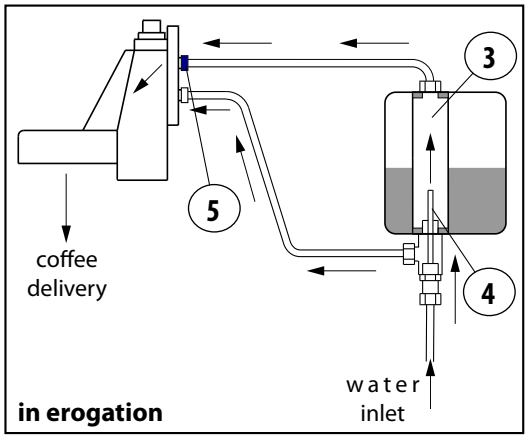
- activation of the solenoid valve and of the pump allow cold water to enter the exchanger (**3**) through the injector (**4**) ;
- from the exchanger (**3**)the boiler water is carried to the group (**1**) for delivery;
- the pump allows the increase of the pressure of the water flow up to 8-9 bar for delivery.

The injector (**4**) and the flow reducer (**5**) are important components for the operation of the delivery group.

To increase the coffee extraction temperature, remove the flow reducer (**5**) or replace it with one of a greater diameter; to decrease the temperature, replace it with one of a smaller diameter.



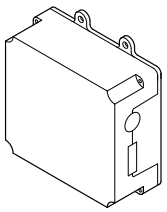
not working



in erogation

8 Electronic control unit (version EVD)

The electronic control unit is installed on the machines with volumetric dosing. Its function is to manage electronically the dose of coffee through the passage of the water in to the dispenser and control the loading of the entry of the water in the boiler. Some versions of control unit are designer for the connection of systems of accounting for payments through a special interface device.



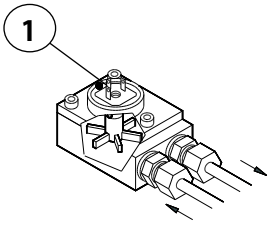
Some units include a button lithium battery. When it needs replacing, disconnect the machine from the power outlet and open the central unit placed inside the equipment.
Dispose the battery in compliance with the collection regulations of the country of use.

9 Volumetric dosing (version EVD)

The volumetric dosing device, installed on electronic version EVD, serves the purpose of measuring the quantity of water sent to the group of espresso delivery.

The dosing device generates an electrical impulse which is sent to the electronic control unit. This impulse is read by the control unit and memorized during the programming of the dose

The flashing of the LED (**1**) indicates that the electrical impulse has been sent from the dosing device to the control unit.

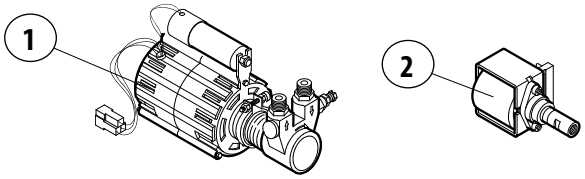


10 Pumping system

This is a component that feeds the machine, raising the water pressure to 8-9 bar for coffee delivery and automatic filling of the boiler.

Depending on the whether the machine is equipped with an inner tank, or connection to the aqueduct, it changes, having supplied:

- motorpump (**1**), in the versions with connection to the water network;
- vibration pump (**2**) in the versions with inner tank.

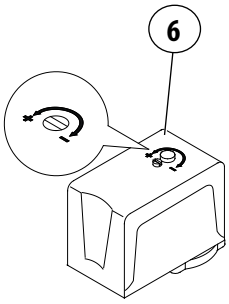


11 Electronic push button panels (version EVD)

The electronic push button panel of the machine permitt selection and programmation of coffee doses. They are connected to the electronic control unit.

To use and programming see the user's manual of the specific model.

12 Pressure switch



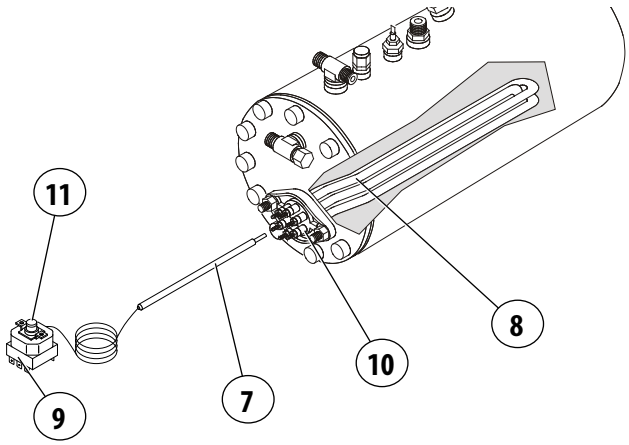
The pressure switch makes it possible to control boiler pressure by activating or bypassing the heating element in the boiler.

Any calibration of the pressure switch which may be required can be carried out with the machine in operation by means of the screw (**6**) located on the body of the component.

! The internal contacts of the pressure switch may be subject to oxidation. It is recommended to clean the contacts regularly spraying them with antioxidants.

13 Thermostat

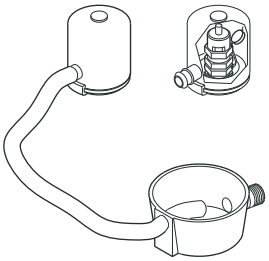
IIThe thermostat allows you to avoid damage to the electrical resistance in case of lack of water in the boiler. The thermostat bulb (**7**) is located inside a sheath (**8**) placed at the center of the resistance. The contacts of the thermostat (**9**) are connected to the electrical resistance (**10**). If the resistance is exposed due to failure to load water to the boiler, the temperature of the resistance increases dramatically. At this point, the thermostat interrupts the power supply to the resistance thus preventing damage.



! To reset the thermostat, press the central button (11). However, before trying to operate the machine, verify the causes of the blockade of the water feeding boiler.

14 Anti-flooding device

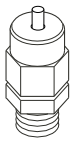
LThe cover installed on the pressure relief valve makes it possible to collect any water which may leak from the boiler due a malfunction and channel it to the drain pad, by means of a special hose.



15 Valve group

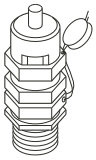
LThe valves are device whose purpose is to ensure the safety and proper operation of the machine.e valvole sono dispositivi atti a garantire la sicurezza e il corretto funzionamento della macchina.

15.1 Valvola antidepressione



LaThe purpose of the negative pressure valve is to prevent the backflow of liquids through the steam nozzle when they are being heated. Furthermore, the excess air is eliminated inside the boiler during the heating phase of the machine.

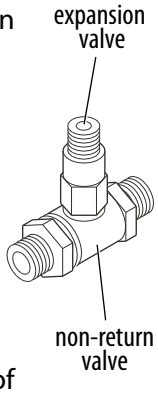
15.2 Safety or pressure relief valve



The purpose relief valve guarantees that the pressure in the boiler does not go above 2 bar. In case of failure of the boiler's monitoring system, the valve can eliminate all the excess pressure from the boiler.

15.3 Expansion-non return valve

This is a valve consisting of an expansion valve and a non-return valve.

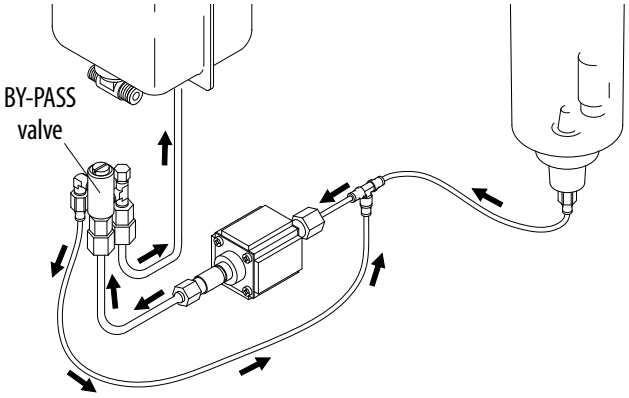


- **espansion valve:** the cold water sent from the pump to the heat exchargers is heated. This heating causes an increase in the volume of water. To limit pressure increases in the hydraulic circuit, the valve limits the maximum internal pressure of the circuit to 12 bar.
- **non-return valve:** its function is that of preventing the back flow of water from the exchargers in the hydraulic circuit.

15.4 BY - PASS valve

It's a valve used in the versions with vibration pump.

It makes it possible to reduce the pressure of water from the vibration pump.



The valves must be checked on a regular basis as described in the chapter "Controls and maintenance".

16 Hot water dispensing nozzle

The hot water dispensing nozzle is connecterd to a suction pipe of the boiler.

Depending on the model, the hot water dispensing may occur in two ways:

- Manual: regolation by rotation of the knob on the front of the machine;
- Automatic: by selection of a button connected to a solenoid valve.

17 Steam dispensing nozzle

Steam dispensing nozzle is connected to the top of the boiler.

The steam dispensing occurs:

- Manual: regolation by rotation of the knob on the front of the machine.

18 Softener

18.1 Description

Mains water contains insoluble salts, which cause the build-up of lime scale deposits in the boiler and other parts of the machine.

Also in drinking water may be present heavy metals and other substances such as chlorine harmful to health.

The softener makes it possible to eliminate or substantially reduce the presence of these mineral salts due to obtain a good coffee.

The cartridge contained inside the filter must be replaced with a frequency as indicated by the manufacturer.

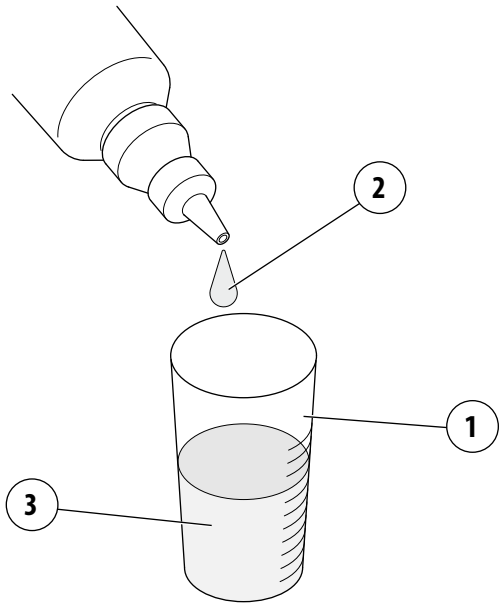
18.2 Measuring of the water hardness

Before using a softener is necessary to verify the characteristics of the water. To determinate the carbonate hardness using the specific kit by following these steps:

1. Put in the test tube (**1**) 10ml of water to analyze;
2. add a drop of reagent (**2**) and mix;
3. proceed in the same way by counting the number of drops until the solution (**3**) change color from Blue to Red

1 DROP = 1°dKH

Example: 9 Drops ----> Carbonate hardness 9°dKH



18.3 Setting by-pass

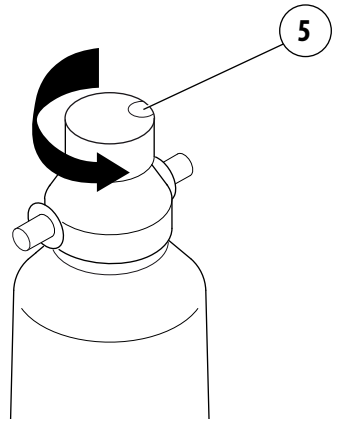
Depending on the hardness of the water, set by-pass of the softener as indicated in the table below.

Example:

Water hardness 9°dKH
|
V
Setting by-pass 2

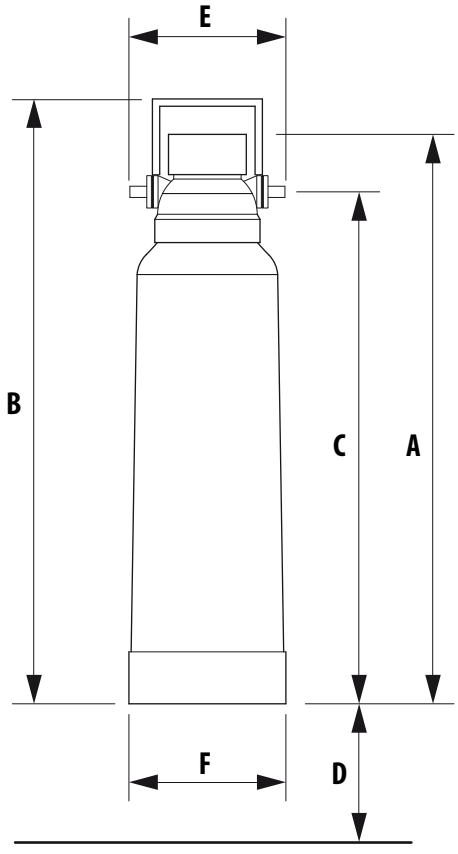
Water hardness (°dKH)	Setting Bypass	Capacity of the filter (liters)			
		V	M	L	XL
4	3	6.250	9.500	13.000	17.000
5	3	5.000	7.600	10.400	13.600
6	3	4.165	6.330	8.665	11.330
7	3	3.570	5.425	7.425	9.710
8	2	3.125	4.750	6.500	8.500
9	2	2.775	4.220	5.775	7.555
10	2	2.500	3.800	5.200	6.800
12	1	1.865	2.835	3.885	5.080
14	1	1.600	2.430	3.330	4.355
16	0	1.185	1.800	2.465	3.220
20	0	945	1.440	1.970	2.575
24	0	790	1.200	1.640	2.145
≥ 25	0	≤ 755	≤ 1.150	≤ 1.575	≤ 2.060

To set the by-pass, push the button (**5**) and rotate.



18.4 Technical data

Model	V	M	L	XL
Connecting fitting type	3/8"	3/8"	3/8"	3/8"
Water supply pressure min.-max. (bar)	2-8	2-8	2-8	2-8
Water temperature min.-max. (°C)	4-30	4-30	4-30	4-30
Environment temperature min.-max. (°C)	4-40	4-40	4-40	4-40
Total height (A) without bracket (mm)	420	475	500	500
Total height (B) with bracket (mm)	445	500	530	530
Connection height (C) (mm)	370	425	450	450
Distance from the floor (D) (mm)	65	65	65	65
Filter head widht (E) (mm)	125	125	125	125
Filter cartridge diameter (F) (mm)	115	130	145	145
Weight (kg) (empty/with water)	2.1/3.2	2.4/4.2	3.4/5.9	3.8/6.0



19 Softener

Alternatively to water filter, a resins softener can be used.

This component has the ability to retain calcium in the water. For this reason, the resins become saturated after a certain period and must be regenerated with coarse kitchen salt (NaCl, sodium chloride) or special water softening salt. It is very important to regenerate the softener within the established times. The regeneration is to be done regularly every 15 days. However, in locations where water is very hard, it will be necessary to regenerate it more frequently. The same rule can be applied to locations where there is a large consumption of hot water for tea or other uses.

Regeneration of the softener

Proceed as follows:

- move levers (**B**) and (**E**) from left to right;
- remove the lid by loosening the knob (**A**);
- release enough water through the pipe (**C**) to make room for the salt to be added, based on the model (see the table on the following page);
- clean any salt or resin residues from the gasket located on the cover;
- put the cover back in place by screwing the knob (**A**) down securely and move the lever (**B**) back from right to left;
- let the salt water drain from the little hose (**D**) until the water is no longer salty (about 30-60 minutes). The salt allows the accumulated mineral salts to be released;
- switch the lever (**E**) from right to left back to its initial position.

! The build-up of lime scale deposits in the hydraulic circuit and boiler inhibits thermal exchange, thus compromising proper operation of the machine. Heavy incrustation of the boiler may cause long machine shutdowns and invalidate the warranty in any case, because it indicates regeneration has been neglected.

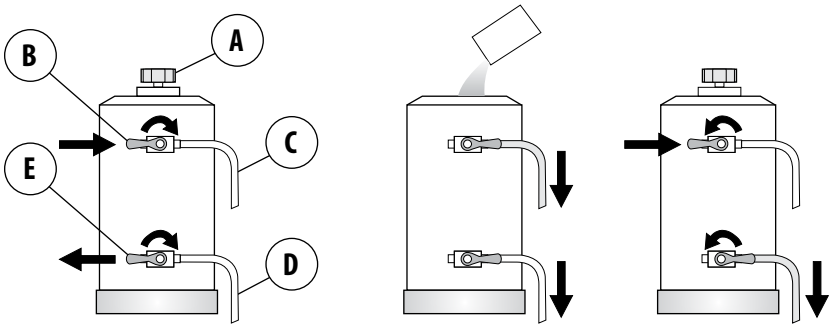
In order to keep the softener, and hence the machine, in perfect operating condition, it is necessary to regenerate it regularly, based on use of the softener and hardness of the water used. The table below shows the quantity of softened water based on hardness in various units of measure:

- °f: French degree
- °d: German degree = 1,8 °f
- mg $CaCO_3$

For further information on softener installation, start-up and regeneration, refer to the instruction manual.

Amount of softened water based on hardness

°f	30	40	60	80	
°d	16,5	22	33	44	salt
mg $CaCO_3$	30	40	60	80	
8 liters	1000 lt	900 lt	700 lt	500 lt	1,0 kg
12 liters	1500 lt	1350 lt	1050 lt	750 lt	1,5 kg
16 liters	2100 lt	1800 lt	1400 lt	1000 lt	2,0 kg



Softner model	Amount of salt
8 liters	1,0 kg
12 liters	1,5 kg
16 liters	2,0 kg

20 Descaling

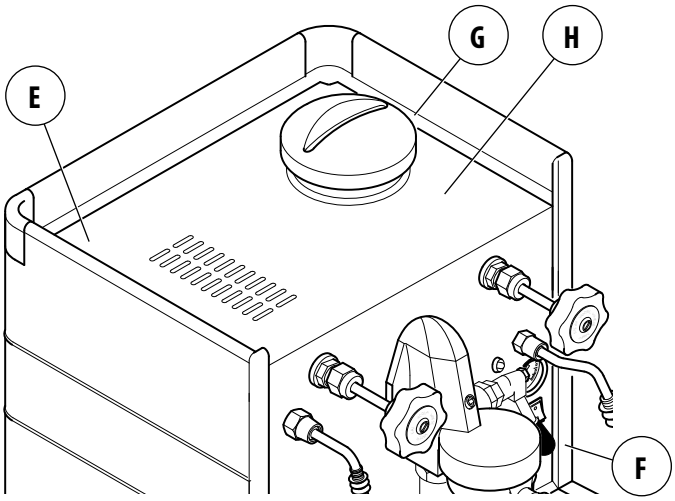
This procedure is designed for use with liquid descaling "PULYDESCALER espresso".

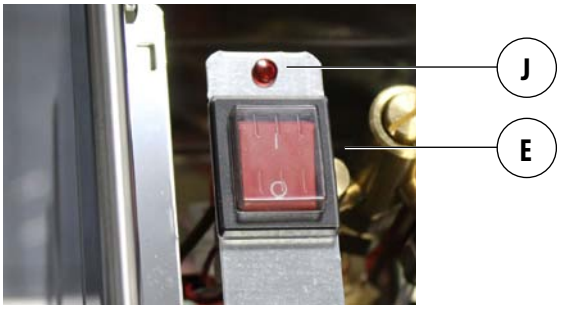
20.1 1GR Version

If the machine is in "Water Mains", mode, it must be switched to internal tank see paragraph 3.5:

- Turn on the machine and bring it to working condition: the gauge should show a pressure of 1-1.2 bar;
- place a large pitcher under the coffee spout and make sure the lever of the dispensing group (**F**) is closed;
- remove the internal tank (**G**) and the upper grid (**H**) so as to gain access to the descaling switch (**E**);
- set the switch (**E**) in position (**1**); the corresponding LED (**J**) lights up to indicate that the machine is configured for the descaling;
- replace the upper grid and the tank;
- fill the tank with a solution of "PULYDESCALER espresso" and water at room temperature;
- perform a series of 30-second deliveries, alternated by another 30 second pause, until the tank containing the solution of detergent will be emptied completely;
- wait about 5 minutes, so as to allow the descaling agent to work;
- remove and wash the tank with clean water;
- fill it with 4 liters (tank full) of clean cold water and put it back in place;
- perform another series of deliveries until the tank is empty, and then fill it up with cold clean water and perform this operation again, so as to completely rinse the tank;
- remove the tank (**G**) and the upper grid (**H**) and return the descaling switch to position (**0**), then replace the grill and the tank.

At this point, the procedure is complete; if you want, you can reconfigure the machine to be fed by the water mains; otherwise, if everything is left unchanged, it will continue to be fed by the inner tank.





Throughout the procedure DO NOT open the water and/or steam taps.
For perfect cleaning, only use special detergent that is to be diluted in the amount of cold water indicated on the package (see installer).

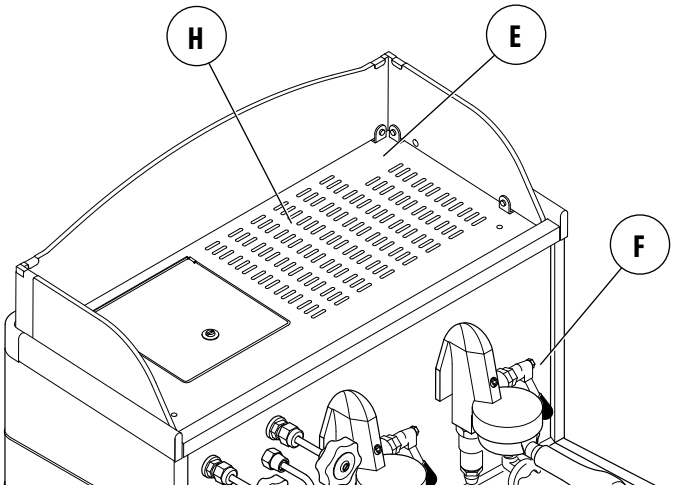
20.2 2GR Version

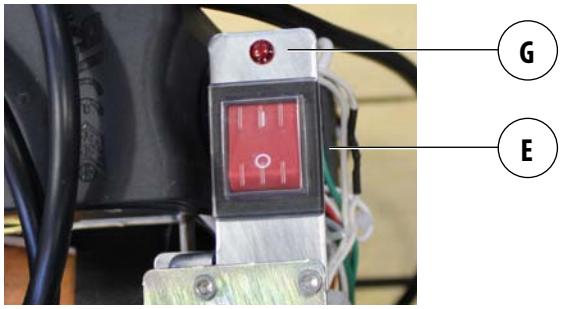
If the machine is in "Water Mains", mode, it must be switched to internal tank see paragraph 3.7:

- turn on the machine and bring it to working condition: the gauge should show a pressure of 1-1.2 bar;
- place under all coffee spouts a large pitcher and make sure the levers of the groups (**F**) are closed;
- fill the tank with a solution of 125 ml of "PULY-DESCALER espresso" and 400 ml of water at room temperature;
- remove the upper grid (**H**) so as to gain access to the descaling switch (**E**);
- set the switch (**E**) in position 1; the corresponding LED (**G**) lights up to indicate that the machine is configured for the descaling;
- replace the top grid;
- perform a series of 30-second deliveries, alternated by another 30 second pause on both dispensing units, until the tank containing the solution of detergent will be emptied completely;
- remove and wash the tank with water;
- fill it with 4 liters (tank full) of clean cold water and put it back in place;
- perform another series of deliveries on all dispensing units, until the tank will be emptied so as to perform the complete rinsing;
- remove the upper grid (**H**) and return the descaling switch to position (**0**), then replace the grill.
- At this point, the procedure is complete; if you want, you can reconfigure the machine to be fed by the water mains; otherwise, if everything is left unchanged, it will continue to be fed by the inner tank.

If during the dispensing is blocked during the procedure, check if the LED (**G**) is on. If it is off, return the machine to working conditions by performing these steps:

- make sure that the levers of the groups (**F**) are in the closed position;
- remove and wash the tank with warm water, then fill it with clean cold water and put it back in place;
- return the descaling switch (**E**) to position (**0**);
- return the machine to working condition: the gauge should show a pressure of 1-1.2 bar;
- repeat the descaling procedure again if not completed; otherwise, it will be sufficient to carry out the rinsing only.



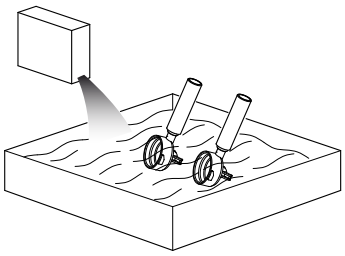


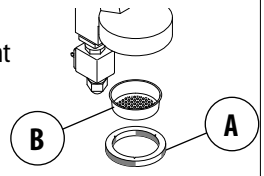
Throughout the procedure DO NOT open the water and/or steam taps.
For perfect cleaning, only use special detergent that is to be diluted in the amount of cold water indicated on the package (see installer).

21 Cleaning

For perfect cleaning and efficiency of the appliance, several simple cleaning operations are necessary on the functional parts and accessories as well as the body panels. The indications given here are applicable for normal use of the coffee machine. If the machine is used continuously, then cleaning should be performed more frequently.

Before cleaning the machine, turn it off the machine and let it cool off.

Cleaning	Daily	Weekly	Monthly
CAPPUCCINO MAKER Clean it several times a day as indicated in chapter "Cappuccino Maker", especially if used continuously	**XXX**		
FILTERS and FILTER HOLDERS Clean the filter holders daily by leaving them immersed in hot water all night so as to allow greasy coffee deposits to dissolve; afterwards, rinse off everything with cold water. Perform the same cleaning weekly for 10 minutes in hot water and the appropriate cleaner. Failure to clean the filter holders daily will jeopardize the quality of the coffee and the proper functioning of the filter holder. **Warning: only immerse the cup of the filter holder.** **Avoid immersing the handle in water.** 	**X**		

Cleaning	Daily	Weekly	Monthly
BODY Cleaning of panels with a cloth moistened with lukewarm water. Remove the tray and Cup holder Grill and wash all with hot water. Avoid the use of abrasive cleaners that may scratch the surface of the bodywork. During cleaning pay attention to edges and protruding parts.	**X**		
STEAM NOZZLE Clean the steam nozzles making a quick delivery till empty after each use and clean with a cloth dampened with warm water.	**X**		
STEAM NOZZLE TERMINALS Check and clean the terminals of launches by restoring the steam outlet holes with a small needle.	**X**		
PERFORATED DISK and CONTAINMENT RING Remove the containment ring (**A**). Remove the perforated disk (**B**). Wash with hot water. 		**X**	
DISPENSING UNIT Wash the units as indicated: • use the blind filter holder; • pour the detergent on the solid filter and attach the filter holder; • carry out a series of deliveries until the water comes out clean; • remove the filter holder from the unit and carry out at least one delivery so as to eliminate any detergent residues.	**XXX**		

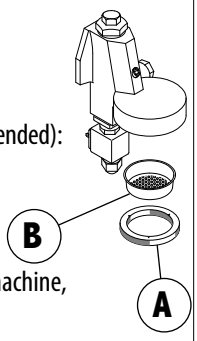
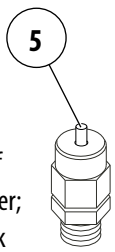
X : Important

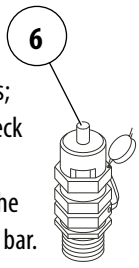
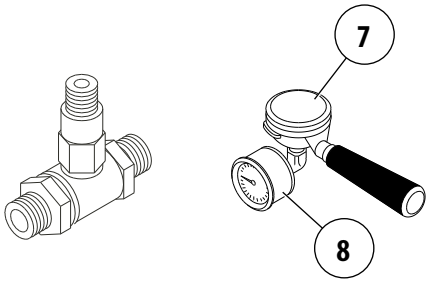
XXX : Very important

When cleaning, always use cloths that are completely clean and hygienic. To guarantee the correct operation and hygiene of the hot beverages dispenser, it is necessary to use the cleaning methods and products suitable for this purpose. Do not immerge the machine into water. Never use alkaline detergents, solvents, alcohol or aggressive substances. The descaling of the machine has to be performed by specialized technicians, by disassembling the components with deposits, so that no descaling debris is put into circulation. The used products/detergents have to be suitable for this purpose and must not corrode the materials of the hydraulic circuits.
Cleaning operations must not be made by children without supervision.
No spills and water jets on the machine.

22 Checks and maintenance

To ensure perfect safety and efficiency of the machine over time, it is necessary to carry out maintenance. In particular, **it is advisable to carry out an overall check of the machine at least once a year**.

Checks	Weekly	Monthly	Yearly
MACHINE Using the pressure gauge keep the boiler pressure between 0,8 - 1,2 bar	X X X		
DISPENSING UNIT Every 4 months replace some components of the group (only original parts are recommended): • containment ring (**A**) • perforated disk (**B**)  In case of intensive use of the machine, replace components more frequently.		X	
- Control amy HYDRAULIC LEAKS on the bench and drains efficiency		X	
VALVES Check for proper operation of the negative pressure valve, pressure limiting valve and non-return drain valve. If, owing to failure, their replacement becomes necessary, repeat the test with the new valve installed.			X
NEGATIVE PRESSURE VALVE 1) first try : • remove the top grill of the machine; • use pliers to push the pin (5) downwards; • if the pin does not move, it probably means the valve is encrusted with limestone and must be replaced.  2) second try : • turn the machine off; • open the steam valves and drain off all the pressure from inside the boiler; • turn the machine back on and check for regular closure of the valve.			X

Checks	Weekly	Monthly	Yearly
SAFETY OR PRESSURE RELIEF VALVE 1) first try : • remove the top grill of the machine; • use pliers to pull the pin (6) upwards; • if the pin does not move, it probably means the valve is encrusted with limestone and must be replaced. 2) second try : • turn the machine off; • block the pressure switch contacts; • turn the machine back on and check for pressure in the boiler to rise; • check for correct intervention of the valve at a maximum pressure of 2 bar.  			X
NON RETURN-DRAIN VALVE • Activate the delivery groups for about 30 seconds; • attach a filter holder (7) with a gauge (available on request) to the delivery group; • activate the delivery group, and use the gauge (8), to monitor pressure increase up to 8-9 bar; • check the increase in the pressure due to the expansion of the heated water up to a value of approximately 12 bar: reaching this value confirms proper operation of the valve, as well as of the gaskets and solenoid valves seal; • de-activate the deliveries; • check the other delivery groups.  			X
• Verify the correct functioning of the GAUGE. • Control any presence of LIMESTONE on resistance and boiler. • Verify the efficiency of the SOLENOID VALVE of the dispensing group.			X

Checks	Weekly	Monthly	Yearly
SOFTENER The formation of limescale in the hydraulic circuit of the machine indicates that regeneration has been neglected. Servicing the boiler hydraulic circuit and replacing any components. Be careful in places where water is very hard, it will regenerate shorter intervals, as well as in cases of large consumption of hot water for tea or other.		X	

! All maintenance operations must be carried out after the power supply detachment, hydraulic supply closing and full cooling of the machine. We recommend the use of suitable protective gloves.

! Not After maintenance and/or repair intervention, the components used must ensure that the hygiene and safety requirements initially provided for the appliance are still met. These are met by using original spare parts only. After repair or replacement of components related to parts in direct contact with water and food, a washing procedure has to be carried out, as in the case of first installation.

23 Malfunctions and related solutions

MALFUNCTION	CAUSE	SOLUTION
MACHINE LACKING POWER	**1.** The general switch is in the "0" position **2.** The machine switch is defective **3.** The mains power switch supply is in "OFF" position **4.** The wiring is defective	**1.** Place the general switch in the "1" position **2.** Replace the main switch **3.** Place the main power switch in "ON" position **4.** Check for any faulty connection
NO WATER IN BOILER	**1.** The water supply tap is closed/the inner tank is empty **2.** The pump filter is clogged **3.** The motor pump is disconnected or jammed **4.** The water filling solenoid valve is defective **5.** The water inlet solenoid valve filter is clogged	**1.** Open the water supply tap/Fill the tank **2.** Replace the pump filter **3.** Check the motor pump **4.** Replace the water filling solenoid valve **5.** Clean or replace the water inlet solenoid valve filter
TROPPA ACQUA IN CALDAIA	**1.** The solenoid valve of the automatic level device is defective **2.** The heat exchanger is drilled **3.** The solenoid valve of the automatic level remains plugged	**1.** Replace the solenoid valve of the automatic level device **2.** Replace the boiler **3.** Check the solenoid valve; the mass to the frame and the efficiency of the electronic control unit
STEAM DOES NOT COME OUT OF NOZZLES	**1.** The electrical heating element is faulty **2.** Pressure switch contact are oxidized **3.** The sprayer nozzle is clogged	**1.** Replace the heating element **2.** Clean contact or replace pressure switch o sostituire il pressostato **3.** Clean the sprayer nozzle
STEAM MIXED WITH WATER COMES OUT OF THE NOZZLES	**1.** The boiler level is too high	**1.** Check the status of the probe level: check the correct position and control the presence of shallow limestone
NO DELIVERY	**1.** No water supply/the inner tank is empty **2.** The group solenoid is faulty **3.** The pump is blocked **4.** The injector is clogged **5.** The group solenoid is clogged or dirty **6.** The doser is blocked **7.** Air in the plant **8.** Pressure of reducer too low	**1.** Check the water supply / Fill the inner tank **2.** Replace the group solenoid. **3.** Replace the pumo. **4.** Check or replace the injector **5.** Clean or replace the solenoid **6.** Check or replace the doser **7.** Dispensig until the new erogation of eatr **8.** Increase the pressure of reducer
WATER LEAKS FROM THE MACHINE	**1.** The pad does not drain **2.** The drain pipe is broken or detached or the water flow is obstructed **3.** Hydraulic leaks in the hydraulic circuit	**1.** Check the sewer drain **2.** Check and restore the connection of the drain pipe to the pad **3.** Identify and eliminate any hydraulic leaks
COFFEE IS TOO COLD	**1.** The electrical heating element of the coffee boiler is faulty. **2.** The wiring is faulty. **3.** Lime scale on the heating element. **4.** Pressure switch contact are oxidized **5.** Pressure switch has intervened **6.** The limestone has reduced water circulation **7.** The dispensing group is cold	**1.** Replace the heating element **2.** Check for any faulty connections **3.** Clean the machine **4.** Clean contacts or replace pressure switch **5.** Re-arm the heating element **6.** Clean raccords or replace circulation pipes **7.** Eliminate the presence of air bubbles in the hydraulic circuit as follow: • disconnect electrically the pump; • close the water tap of the softner; • vacuum supply for few minutes; • connect electrically the pump; • open the water exit tap of the softener; • make dispensing until the exit of water; • wait few minutes for warming up

MALFUNCTION	CAUSE	SOLUTION
COFFEE IS TOO HOT	**1.** The temperature of the boiler is too high **2.** The flow reducer of the group is unsuitable	**1.** Reduce the pressure in the boiler by turning the pressure switch with the screw(versions EMA-EPU) **2.** Replace the regulator with a smaller diameter one
COFFEE DISPENSED TOO QUICKLY	**1.** Coffee is ground too coarsely	**1.** Adjust the grinding of the coffee
COFFEE DISPENSED TOO SLOWLY	**1.** Coffee is ground too finely **2.** The injector is clogged **3.** The group is clogged **4.** Filter holder is dirty	**1.** Adjust the grinding of the coffee **2.** Replace the injector **3.** Control and clean the dispensing unit **4.** Clean or replace filters
WET COFFEE GROUNDS	**1.** The group solenoid valve drain is clogged **2.** The dispensing unit is too cold **3.** Coffee is ground too finely	**1.** Clean the drain of the dispensing unit **2.** Wait until the complete heating of the group **3.** Adjust the grinding of the coffee
THE GAUGE INDICATES UNACCEPTABLE PRESSURE	**1.** The pressure gaugeis faulty **2.** Incorrect motor pump calibration (versions EMA-EPU)	**1.** Replace the pressure gauge **2.** Adjust the calibration of the motor pump (versions EMA-EPU)
GROUNDS IN CUP	**1.** The filter holder is dirty **2.** The filter holes are worn. **3.** The coffee is not ground evenly **4.** The seal under the pad is worn **5.** The temperature of the delivery water is high	**1.** Clean the filter holder **2.** Replace the filter **3.** Replace the grinders **4.** Replace the seal **5.** Decrease the temperature of the groups and/or of water used for coffee preparation
for EVD: INCORRECT COFFEE DELIVERY THE COFFEE DOSE IS NOT MET THE LED OF THE DOSE BUTTON FLASHES	**1.** The connection of the volumetric dosing device is faulty **2.** The connection of the electronic control unit is faulty **3.** The connector of the volumetric dosing device has humidity on it **4.** The volumetric dosing device is faulty: during delivery the dosing device, LED does not flash **5.** The coffee is ground too finely: there is not sufficient water flow in the dosing device **6.** The drain valves lose pressure (the dose is too small) **7.** The drain valves lose pressure (the dose is too small) **8.** Water leakage from the group solenoid valve during coffee delivery or when in stand-by **9.** The volumetric dosing device is partially obstructed	**1.** Check for proper connection of the volumetric dosing device connector **2.** Check for proper connection of the 8-pin connector of the electronic control unit **3.** Remove the connector of the volumetric dosing device and thoroughly dry the contacts **4.** Replace the heads of the volumetric dosing device or replace the dosing device **5.** Adjust the grinding suitably and check the grinders, if necessary **6.** Check and replace the non-return valve, if necessary **7.** Check and replace the drain valves, if necessary **8.** Clean and replace the solenoid valve, if necessary **9.** Clean or replace the volumetric dosing device
for EVD: ALL THE LEDS OF ALL THE PUSH BUTTON PANELS ARE FLASHING for EPU: FRONTAL LED IS FLASHING	After a few minutes, automatic filling with water is stopped: **1.** The device is in time-out **2.** No water in mains/the inner tank is empty **3.** Some of the hoses in the circuit are clogged **4.** The probe and/or the mass are disconnected	**1.** Turn the machine off and then back on **2.** Open the water supply tap **3.** Check and replace the defective hoses **4.** Check and restore the connections
SHUTDOWN OF THE ELECTRONIC SYSTEM	**1.** One of the volumetric dosing device's contacts is grounded	**1.** Check the connection of the volumetric dosing device
THE PUMP LEAKS WATER	**1.** Poor mechanical grip of the shaft or O-Ring seal (only with motorpump) **2.** The inlet and outlet connections are loose **3.** The hex nut of the pressure relief valve or filter is loose (only with motorpump) **4.** The seal or O-Ring of the pressure relief valve or filter is faulty (only with motorpump)	**1.** Check the status of the pump and take any corrective action which may be required **2.** Tighten the connections **3.** Tighten the hex connection of the pressure relief valve and filter **4.** Replace the seal and O-Ring, taking care not to change the calibration of the valve

MALFUNCTION	CAUSE	SOLUTION
THE MOTOR STOPS SUDDENLY OR THE THERMAL PROTECTOR INTERVENES DUE TO OVERLOAD	1. Lime scale and mineral build-ups in the pump have caused it to jam 2. The pump and motor are not aligned (only with motorpump) 3. The motor is faulty (only with motorpump) 4. The motor is wired with non-conforming voltage (only with motorpump)	1. Check the status of the pump and replace it, if necessary 2. Install the motor-pump joint 3. Replace the motor 4. Ensure the power supply voltage of the motor is correct
THE PUMP FUNCTIONS BELOW NOMINAL CAPACITY	1. The inlet is clogged, perhaps only partially 2. The rotation sense of the pump is incorrect (solo motopompa) 3. The pressure relief valve is not properly calibrated 4. The motor runs at low RPM (only with motorpump) 5. The inside of the pump is damaged due to the infiltration of foreign materials	1. Clean the filter holder 2. Check the engine 3. Calibrate the relief valve 4. Check the voltage or replace the motor 5. Replace the pump
THE PUMP IS NOISY	1. The pump and motor are not aligned (only with motorpump) 2. The seal or O-Ring of the pressure relief valve or filter is faulty 3. The joint, the coupling screw or the V-shaped clamp are loose (only with motorpump) 4. The inlet is clogged, perhaps only partially 5. The hex nut of the pressure relief valve or filter is loose (only with motorpump)	1. Install the motor-pump joint 2. Replace the seal and O-Ring, taking care not to change the calibration of the valve 3. Align and tighten the components which are loose 4. Clean the filter holder 5. Tighten the hex connection of the pressure relief valve and filter
THE CUP IS DIRTY WITH SPLASHED COFFEE	1. Steam pockets in the delivery system 2. Air pockets in the hydraulic circuit 3. Coffee is ground too coarsely 4. The flow reducer group is unsuitable	1. Reduce the water temperature 2. Check the cause and eliminate the problem 3. Adjust the grinding suitably 4. Replace the flow reducer

Any action taken by a technician on the electronics of the machine when the machine is still supplied with electrical power automatically invalidates any guarantee. The technician needs to be aware that the machine is electrically connected and act accordingly.

24 List of hazards

This chapter describes possible hazards for the user if the specific safety standards (described in this manual) are not followed.

The appliance must be connected to an efficient grounding system

If this is not done, the appliance can be a source of dangerous electrical shocks as it is no longer able to discharge electricity to earth.

Do not use running water for washing

The use of pressurized water directly on the machine can seriously damage the electrical equipment. Never use water jets to wash any part of the appliance.

Be careful of the autosteamer, steam and hot water nozzles

During use, the autosteamer, steam, and hot water nozzles become very hot and are thus a potential source of danger. Handle these parts carefully. Never direct steam or hot water jets directly on the body.

Be careful of the external surfaces of the dispensing unit

During normal operation, the dispensing unit overheats and constitutes a potential source of danger. Take care not to come into contact with the outer surfaces of the group.

Do not work on the machine when it is supplied with electrical power

Before carrying out any maintenance or repair work on the machine you must turn it off using the main switch or, better yet, disconnecting the mains connection terminals. Never remove any body panel when the machine is supplied with electrical power.

If you should decide not to use the appliance

It is necessary to shut it down by disconnecting the power supply cable from the electrical mains, closing the inflow of water from the hydraulic mains and emptying the hydraulic system.

For the operations of disconnection from the electrical and hydraulic mains and of release of the water, qualified personnel has to be contacted.

Never work on the hydraulic system before having emptied it

All work regarding the hydraulic system and the related boiler is to be avoided when there is still water and pressure in the system. Thus you must empty it beforehand by closing the mains tap and dry-running the delivery group for a short time. Switch off the machine and turn on all the steam and water taps. When the pressure is zero, empty the boiler completely by unscrewing the special pipe fitting located on the lower part of boiler.

If the above procedure is not carried out correctly, opening any part of the hydraulic system can cause a sudden outburst of superheated water under pressure.

Use of the appliance

This espresso coffee machine is an appliance for professional use only. Any other type of use is considered incorrect and therefore dangerous. Never allow children or people not familiar with it to use the machine.

Non-observance of the above-described standards can cause serious harm to people, property or animals.

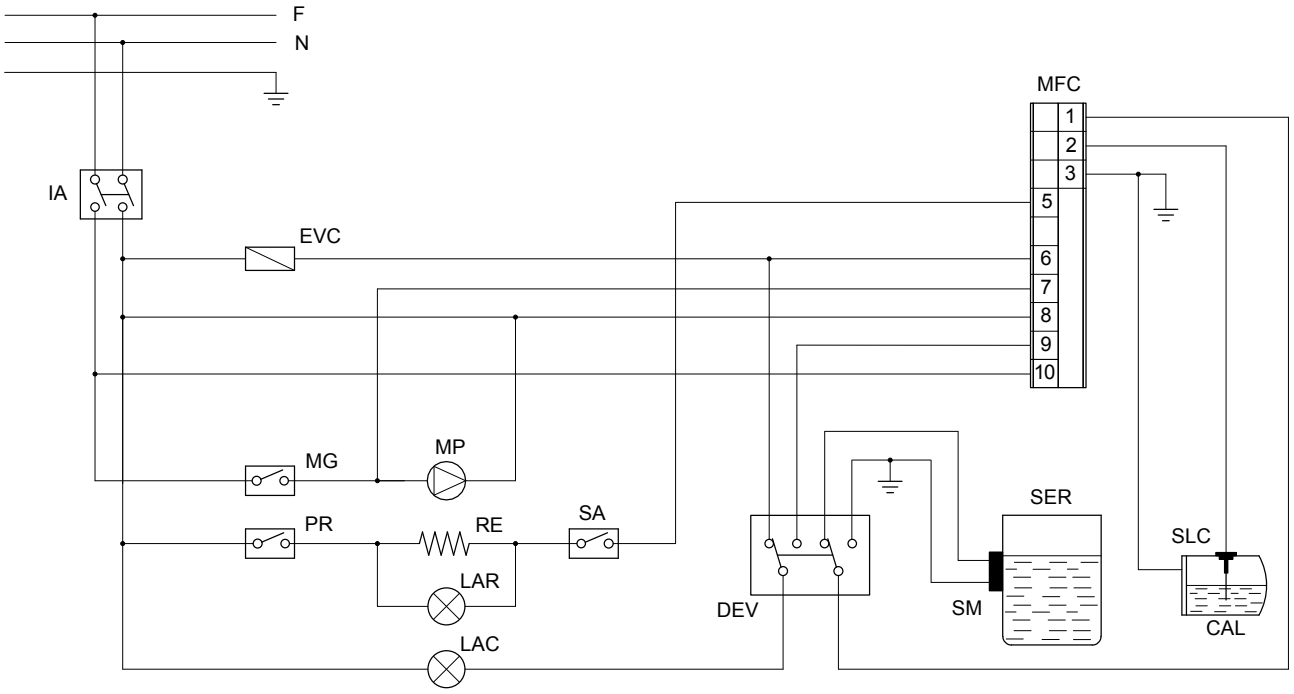
Never operate the electronic apparatus when the appliance is supplied with electrical power.

Shut down the appliance completely by disconnecting it from the power outlet before carrying out any operation.

Section II - ELECTRICAL/HYDRAULIC diagrams

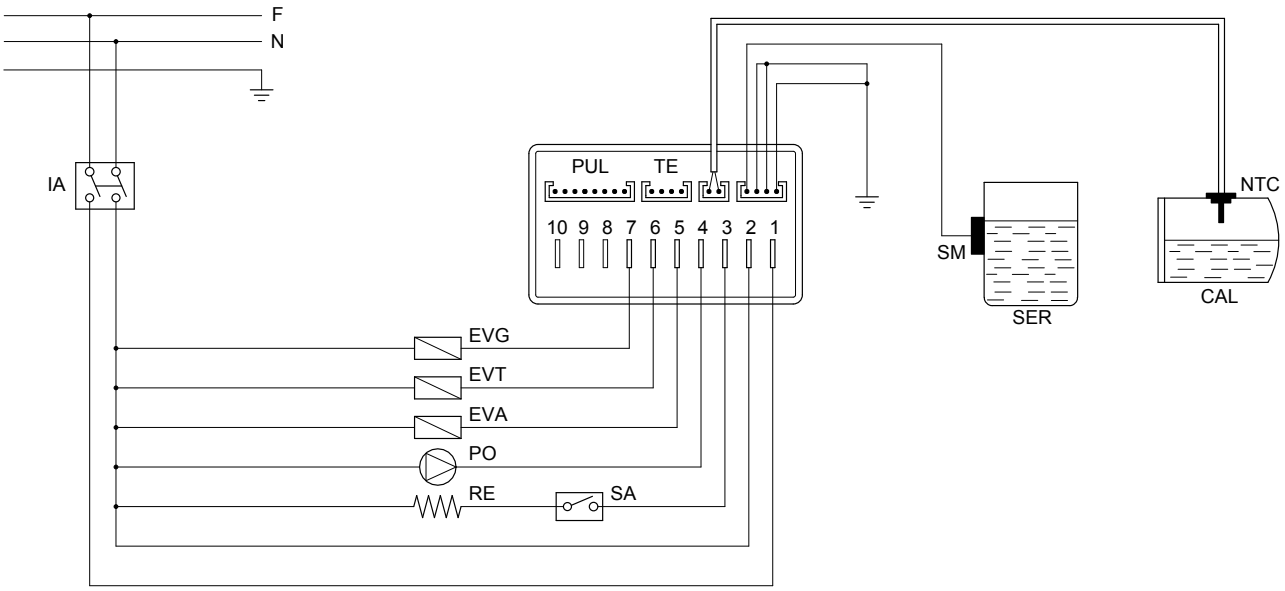
25 Electrical schemes

25.1 Electrical scheme versions1GR EMA-EPU



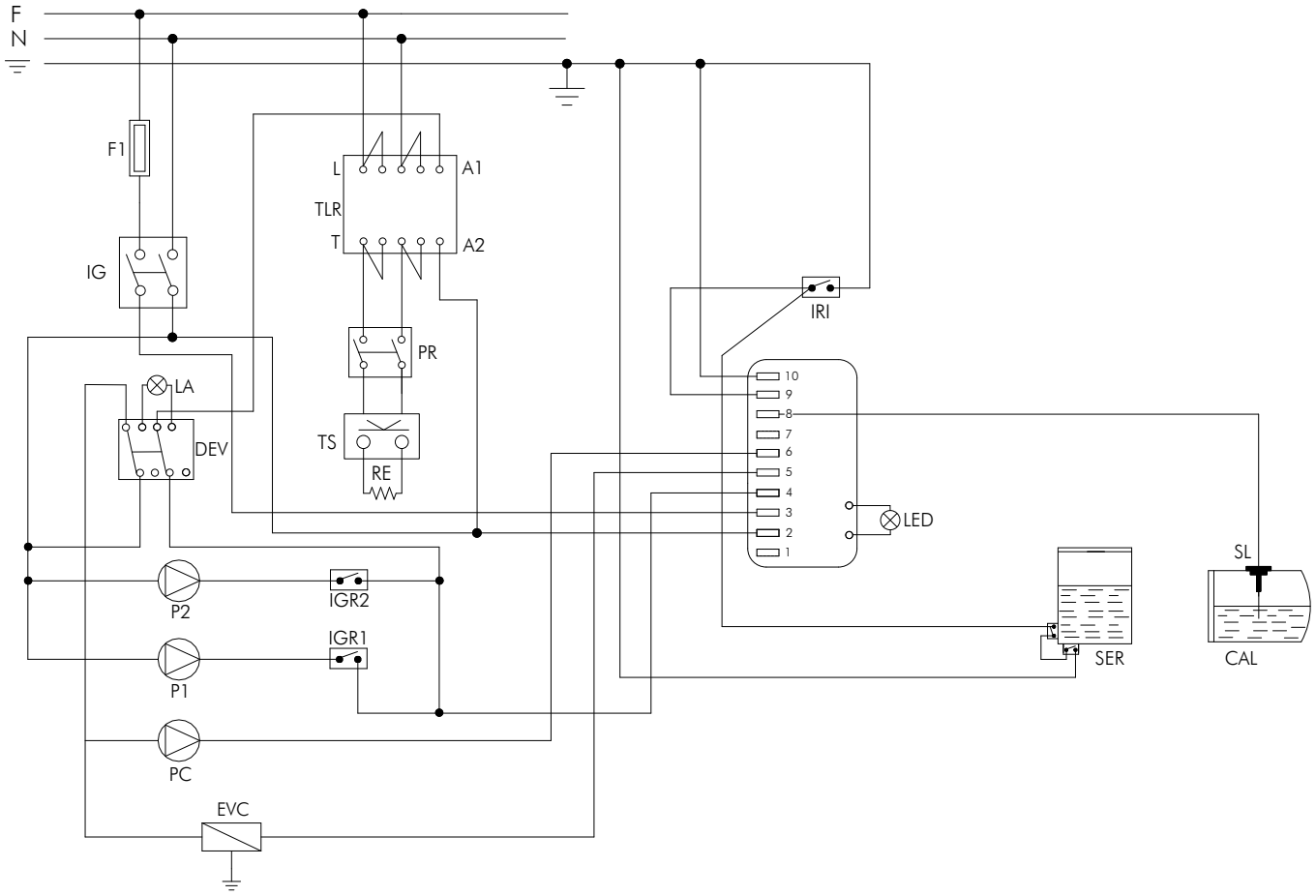
CAL	Boiler
DEV	Diverter
EVC	Boiler fill solenoid valve
F	Phase
IA	Main switch
LAC	Lack of water indicator lamp/Water loading
LAR	Power resistance indicator light
MFC	Control unit
MG	Micro-switch group (version EMA)
MP	Pump
N	Neutral
PR	Pressure switch
RE	Boiler resistance
SA	Resistance saving
SER	Inner tank
SLC	Boiler level probe
SM	Tank magnetic probe
⏚	Ground

25.2 Electrical scheme version 1GR EVD



CAL	Boiler
EVA	Solenoid valve A.E.A.
EVG	Group solenoid valve
EVT	Thè solenoid valve
F	Phase
IA	Main switch
LAR	Electric resistance power indicator lamp
MFC	Control unit
MG	Micro-switch group (version EMA)
MP	Pump
N	Neutral
PR	Pressure switch
RE	Boiler resistance
SA	Resistance saving
SER	Inner tank
SLC	Boiler level probe
SM	Tank magnetic probe
⏚	Ground

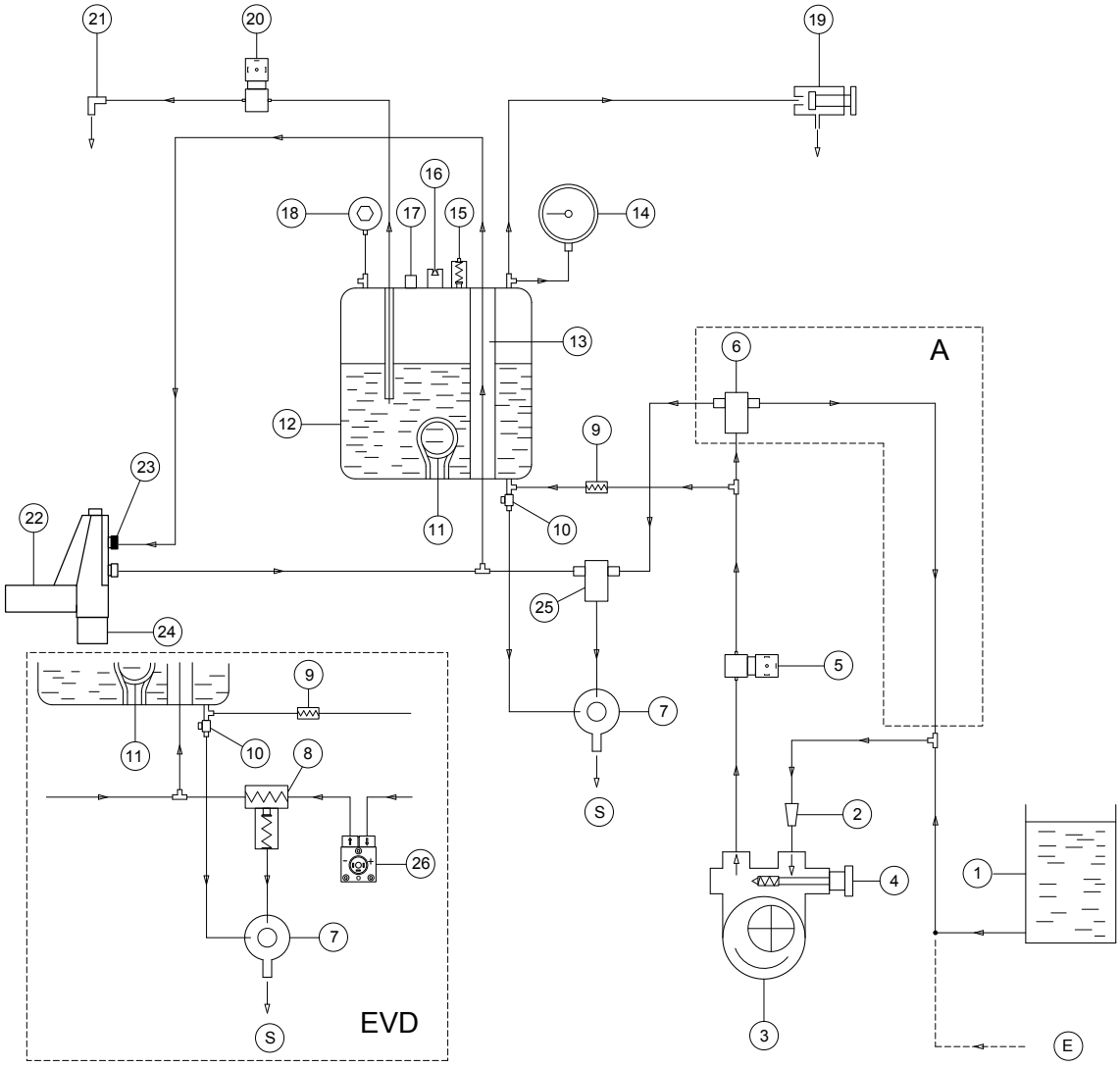
25.3 Electrical scheme version 2GR



CAL	Boiler
DEV	Diverter
EVC	Boiler fill solenoid valve
F	Phase
F1	Fuse entries (10A)
IG	Main switch
IGR1	Switch group 1
IGR2	Switch group 2
IRI	Water network switch
LA	ndicator lamp
LED	LED
N	Neutral
P1	Pump group 1
P2	Pump group 2
PC	Water loading pump
PR	Pressure switch
RE	Boiler resistance
SER	Inner tank
SL	Boiler level probe
TLR	Remote control switch
TS	Thermostat
⏚	Ground

26 Hydraulic schemes

26.1 Hydraulic scheme 1GR

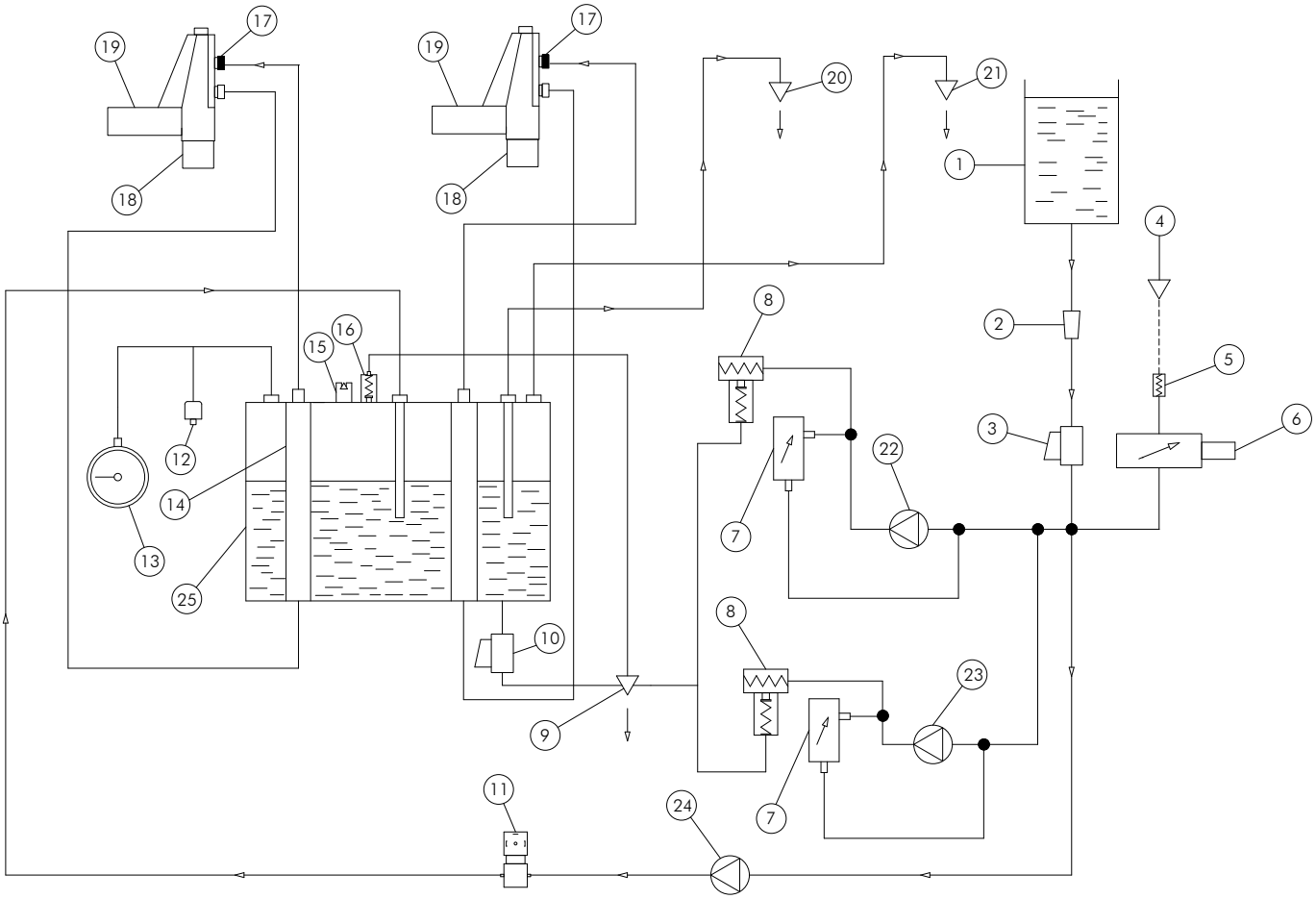


1	Water tank
2	Water entry filter
3	Motorpump/Vibration pump
4	Pressure pump regolation
5	Boiler solenoid valve (AEA)
6	By-pass valve
7	Drain pad
8	Non return+drain valve
9	Non return valve
10	Boiler discharge tap
11	Boiler resistance
12	Boiler
13	Coffee exchanger

14	Pressure gauge
15	Safety valve
16	Antidepression valve
17	NTC probe
18	Pressure switch (versions EMA-EPU)
19	Steam tap
20	Hot water solenoid valve
21	Hot water tap
22	Dispensing group
23	Bottleneck
24	Group solenoid valve
25	Expansion valve
26	Volumetric dispenser(versione EVD)

A	Version Vibration pump
E	Aqueduct
EVD	Version EVD
S	Drain

26.2 Hydraulic scheme 2GR



1	Water tank
2	Water entry filter
3	Tap
4	Water supply entry
5	Non return valve
6	Pressure reducer
7	Flow regulator
8	SCNR valve
9	Drain
10	Boiler drain tap
11	Boiler filling solenoid valve
12	Pressure switch
13	Pressure gauge

14	Coffee exchanger
15	Anti - depressione valve
16	Safety valve
17	Bottleneck
18	Group solenoid valve
19	Dispensing group
20	Water nozzle
21	Steam nozzle
22	Pump group 1
23	Pump group 2
24	Boiler loading pump
25	Boiler

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