

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL
instructions for the technician

ENGLISH

Summary

GENERAL WARNINGS.....	5
WARNINGS FOR THE INSTALLER.....	5
1. TECHNICAL CHARACTERISTICS.....	6
2. PREPARATION OF THE MACHINE.....	10
2.1 UNPACKING.....	10
2.2 EQUIPMENT PREPARATION.....	10
3. MACHINE INSTALLATION.....	11
3.1 POSITIONING.....	11
3.2 HYDRAULIC CONNECTION FOR AEP, SAE.....	12
3.3 WIRING.....	13
3.5 GAS CONNECTION (if included).....	13
3.6 STARTING THE MACHINE.....	14
3.7 EXTERNAL MOTOR PUMP ADJUSTMENT.....	18
3.8 MACHINE TUNE-UP.....	18
4. Distribution machine BOILER and EXCHANGERS.....	18
4.1 ELECTRIC HEATING.....	19
4.2 GAS HEATING.....	19
4.3 COMBINED GAS + ELECTRIC HEATING.....	19
5. COFFEE DELIVERY GROUPS.....	19
5.1 CTS SYSTEM (thermosiphon system).....	19
6. AUTOMATIC WATER ENTRY.....	20
7. ELECTRONIC CONTROL UNIT.....	21
8. VOLUMETRIC DOSING.....	22
9. PRESSURE SWITCH.....	22
10. ANTI-FLOODING DEVICE.....	22
11. PUMPING SYSTEM.....	22
12. THERMOSTAT.....	23
13. VALVE GROUP.....	24
13.1 NEGATIVE PRESSURE VALVE.....	24
13.2 SAFETY OR PRESSURE RELIEF VALVE.....	24
13.3 EXPANSION - NON-RETURN VALVE.....	24
14. SOFTENERS.....	25
15. ELECTRONIC PUSH BUTTON PANELS.....	26
15.1 SAE PUSH BUTTON PANEL.....	26
16. DISPLAY.....	26
17. PREPARATION OF COFFEE.....	27
17.1 AEP VERSION.....	27
17.2 SAE VERSION.....	27

18. PREPARATION OF HOT BEVERAGES.....	28
18.1 MANUAL DISPENSING OF HOT WATER.....	28
18.2 DISPENSING OF HOT WATER WITH KNOB FOR SAE VERSION.....	28
18.3 DISPENSING OF HOT WATER WITH PUSH BUTTON FOR SAE VERSION.....	28
18.4 DISPENSING STEAM	29
19. CUP HEATER.....	29
19.1 ELECTRICAL CUP HEATER.....	29
19.2 ELECTRONICAL CUP HEATER.....	30
20. CAPPUCCINO MAKER.....	31
20.1 INSTALLATION	31
20.2 CLEANING.....	32
20.3 CAPPUCCINO.....	32
20.4 WARM MILK	32
21. CLEANING.....	33
22. CHECKS and MAINTENANCE.....	35
23. MALFUNCTIONS and CORRESPONDING SOLUTIONS	37
24. LIST OF HAZARDS	41
HYDRAULIC DIAGRAMS.....	43
ELECTRICAL DIAGRAMS.....	51

GENERAL WARNINGS

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

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.

ATTENTION

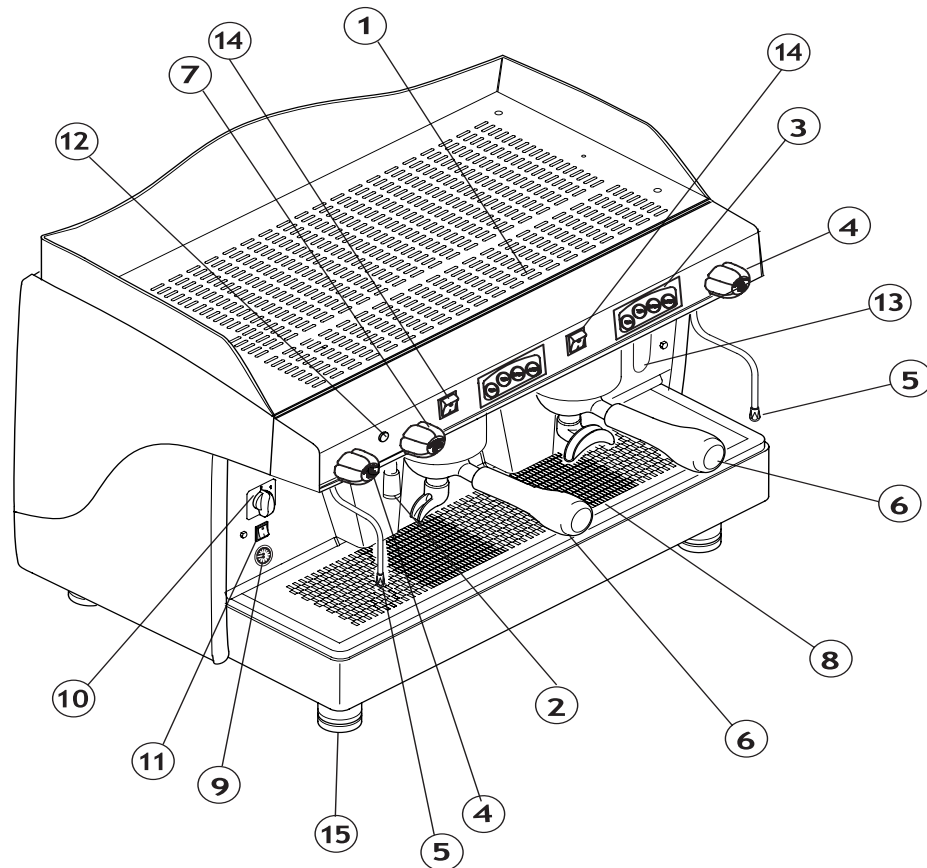
After installing the machine, the installer is required to fill in the "Installation Form" that goes with the machine.

On this form must be confirmed the hygiene and safety requirements in force on the installation site and must be reported any notes relating to changes or interventions necessary for the proper functioning of the equipment.

Filled copies of the Installation form must be kept by the user and by the installer until the end of life of the machine.

In case of withdrawal of the machine, the installer must also provide for the withdrawal of the user's Installation form.

1. TECHNICAL CHARACTERISTICS



1 Cup support grille

2 Hot water nozzle

3 Push button panels

4 Steam pressure gauge

5 Steam nozzle

6 2-cup filter holder

7 Hot water knob

8 Cup support grille

9 Pressure gauge

10 Machine main switch

11 Cup heater switch*

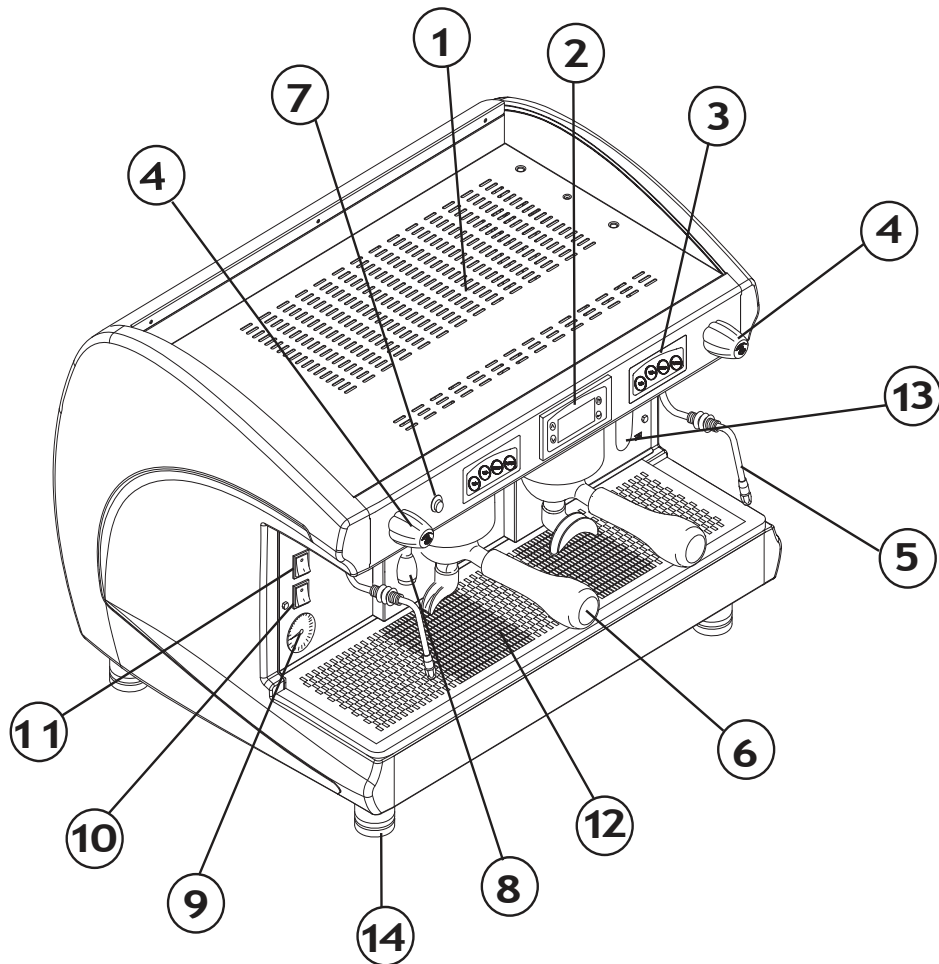
12 Machine "ON" indication light

13 Water level indicator (*)

14 Manual display switch

15 Adjustable feet

*Optional

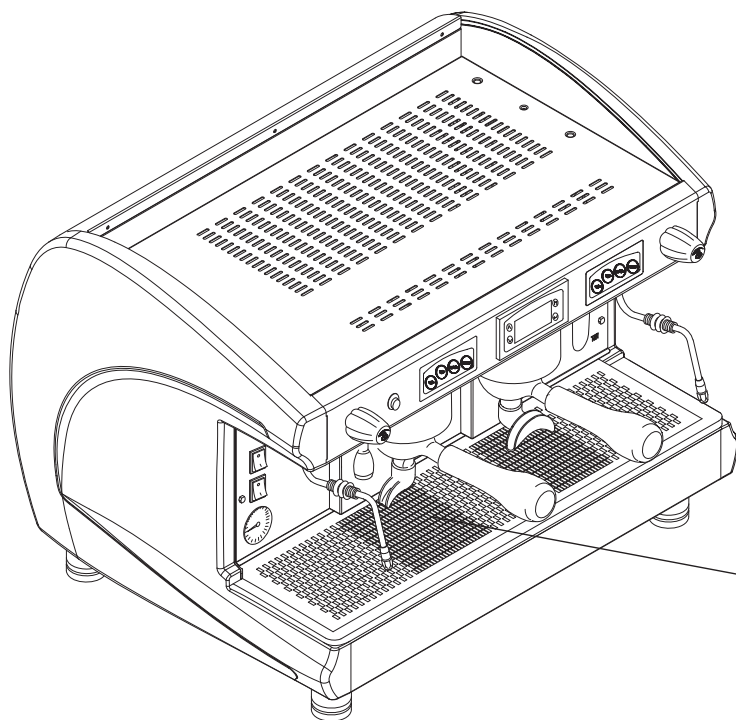


1	Cup heater surface
2	Display
3	Touch pad
4	Steam knob
5	Steam nozzle
6	Filter holder
7	Hot water button
8	Hot water nozzle

9	Boiler / pump pressure gauge
10	Main switch
11	Cup heater switch (optional)
12	Cup holding grille
13	Water level indicator (*)
14	Adjustable feet

(*) In some versions the optical layer is replaced by a green light

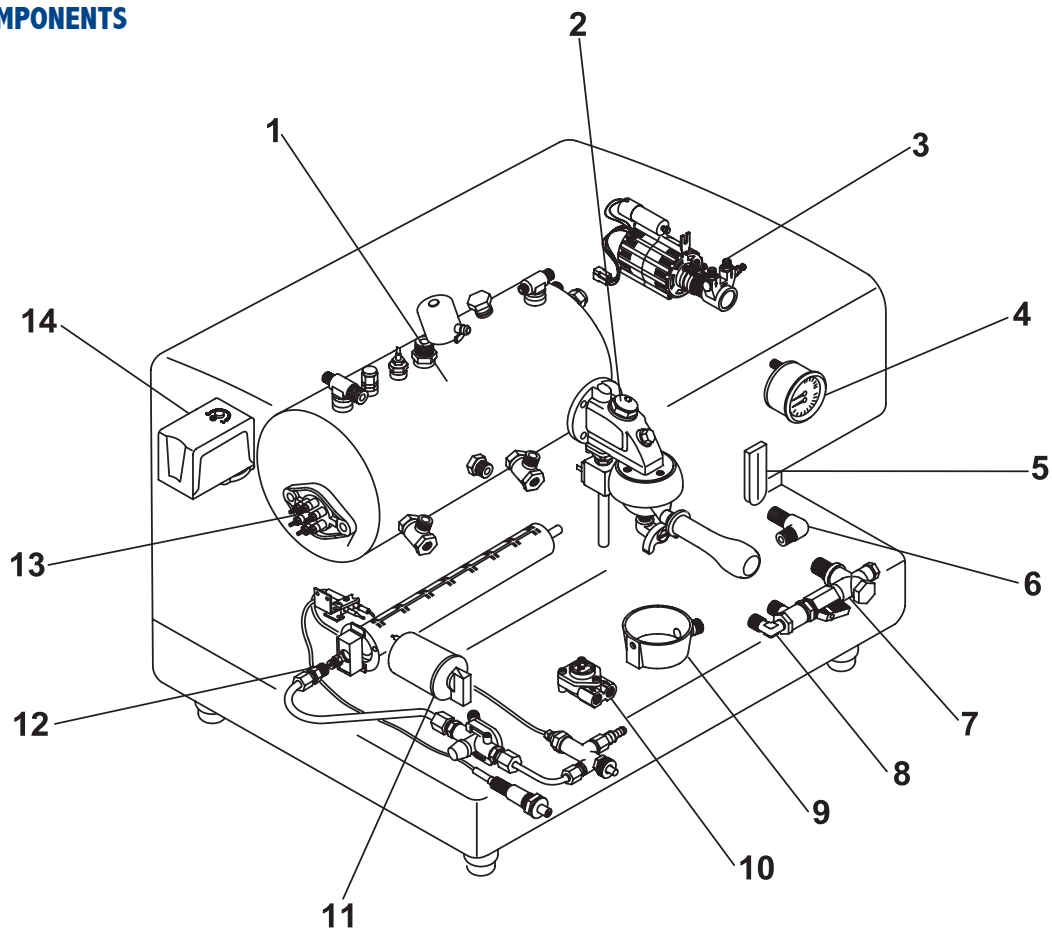
TECHNICAL CHARACTERISTICS



The nameplate of the machine is fixed on the base of the frame under the drain pan.
The data of the appliance can be seen also on the label located on the package of the machine.

VERSION	JUNIOR	1 GROUP	COMPATTA	2 GROUPS	3 GROUPS	4 GROUPS
Boiler capacity (lt)	5	6 - 8	7	10,5 - 14	17 - 21	23
Power supply voltage (V)	120 - 230 240	120 - 230 240 - 400	120 - 230 240 - 400	120 - 230 240 - 400	120 - 230 240 - 400	230 240 - 400
Power (W) 120V	2300	2300	3000	3700	-----	-----
Power (W) 230-240-400V	2300	3000	3000	3900	5300	6300
Boiler pressure (bar)	0,8 - 1,4 MAX					
Safety valve calibration (bar)	1,9					
Supply water pressure (bar)	1,5 - 5 MAX					
Coffee dispensing pressure (bar)	8 - 9					
Operating range and storing conditions	+5°C +40°C MAX 95% U.R.					

INTERNAL COMPONENTS



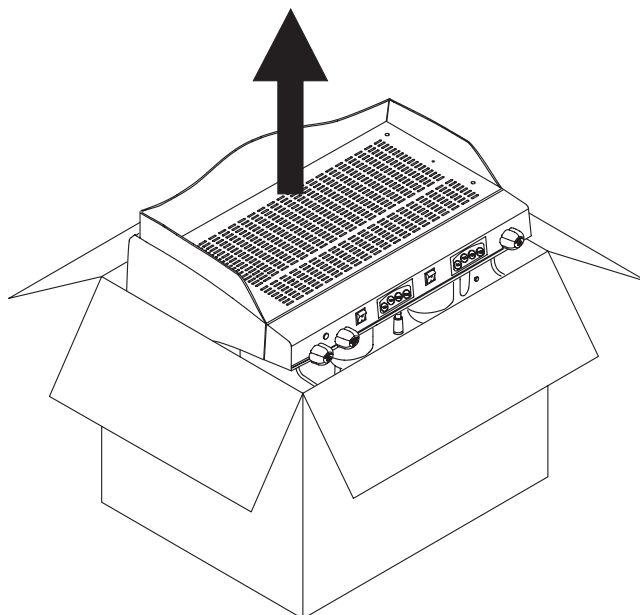
1	Boiler
2	Delivery group
3	Internal motor pump (if included)
4	Boiler / motor pump pressure gauge
5	Boiler level-check window
6	Internal pump water attachment connection (if included)
7	Manual water pump
8	External pump water attachment connection
9	Drain tub
10	Volumetric dosing device
11	Machine main switch
12	Gas system (if included)
13	Electrical heating element
14	Pressure switch

2. PREPARATION OF THE MACHINE

2.1 UNPACKING

Open the packaging, taking care 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.



2.2 EQUIPMENT PREPARATION

Motor pump

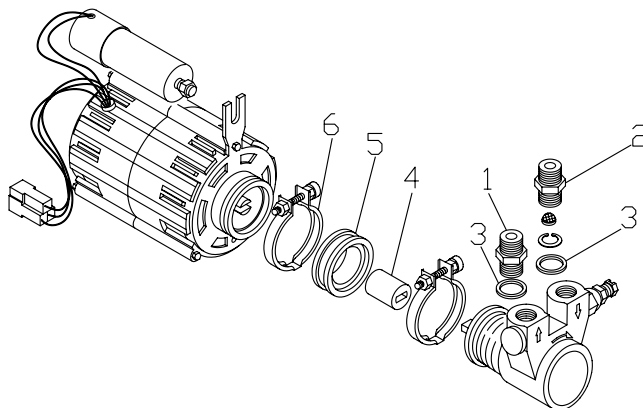
For the machines with an external motor, it is necessary to prepare the pump and the motor.

Fit the 3/8 gas connection with filter **(2)** at the pump inlet (arrow) and the plain 3/8 connection **(1)** at the pump outlet (arrow).

Attention: install the connection with filter **(2)** at the pump inlet.

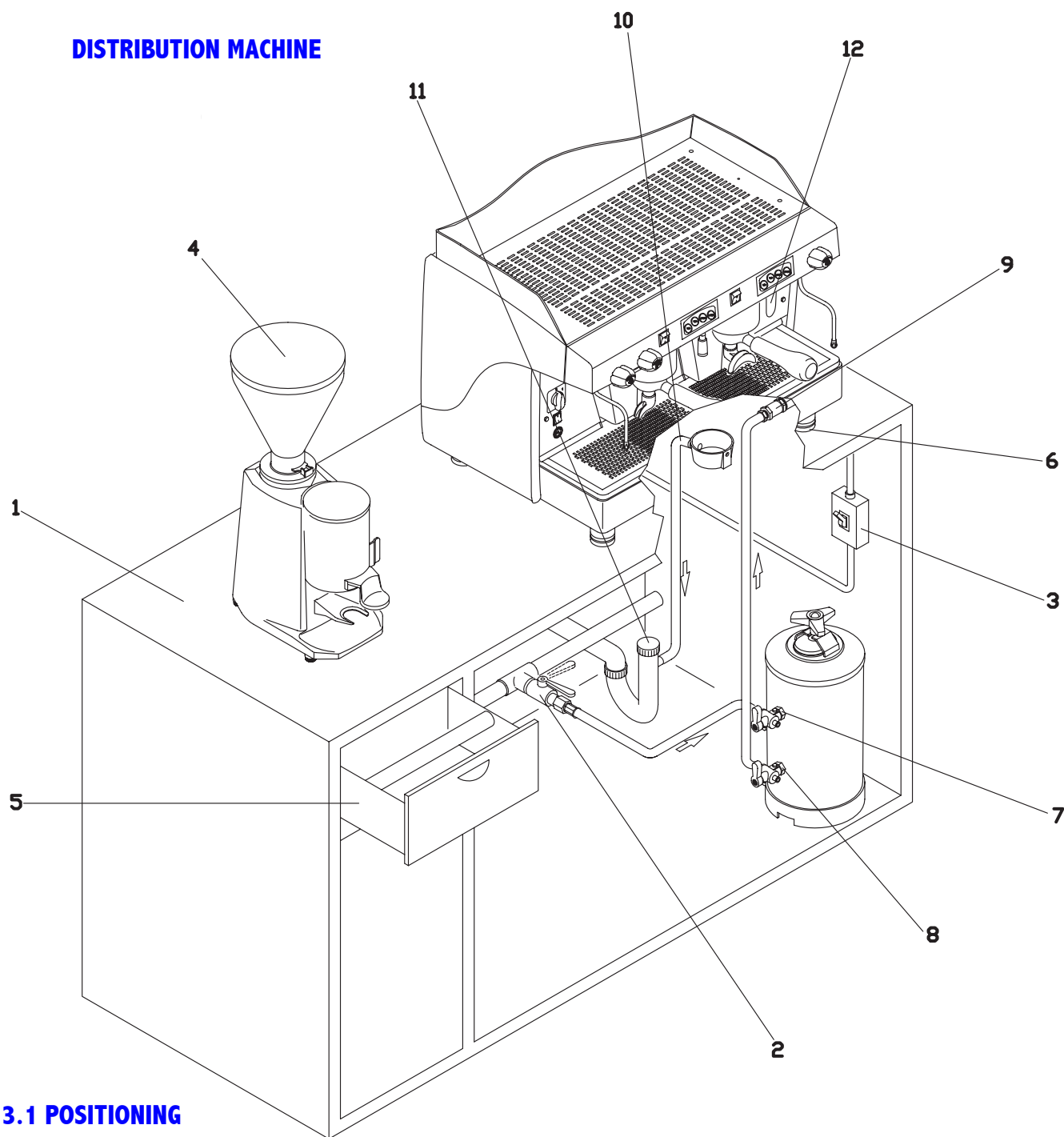
Use the special washers **(3)** provided for the seal.

To correctly couple the pump and motor, use the appropriate joint **(4)** and the spacer ring **(5)**. Lock all of this with the two clamps **(6)**.



3. MACHINE INSTALLATION

DISTRIBUTION MACHINE



3.1 POSITIONING

Prepare an ample support base for the machine that is suitable to support its weight **(1)**; it is important for all terminals of connections to the water mains **(2)**, to the electrical mains **(3)** and to the gas mains (in included), 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. If positioning the machine next to a wall, it is necessary to ensure a minimum distance of 20 cm. between the machine and the wall.

The grinding-dosing machine **(4)** 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 **(5)** for used coffee grounds. Preferably this would also have a rubber device to tap the filter holder against.

ATTENTION

For correct operation, the machine must rest on a perfectly horizontal surface. Any alignment adjustments of the machine must be done by adjusting the feet.(6).

ATTENTION

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.

3.2 HYDRAULIC CONNECTION FOR AEP, SAE

- 1) Remove any rubber plugs which may be inserted in the tap fixtures of the softener;
- 2) Connect the water mains **(2)** to the softener inlet **(7)** using the hose provided;
- 3) rinse the resins of the softener and check that the water, which initially comes out yellowish, comes out clean;
- 4) connect the drain pad of the machine **(8)** to the internal motor pump;
- 5) connect the drain pad of the machine **(10)** to the sewer drain **(11)** using the special hose provided. Avoid overly tight bends or kinks, and make sure that there is sufficient inclination for water to flow out of the drain.

NOTE

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

ATTENTION

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.

Warnings

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) insert a tap **(2)** on the water mains supply so that it will be possible to cut off water flow to the machine;
- 3) in order to prevent it from being damaged, it is advisable to install the softener where it will be protected from accidental blows;
- 4) to prevent the water from freezing, install the softener in rooms with an ambient temperature of more than 5°C;
- 5) if there is no softener, connect the water mains **(2)** directly to the inlet of the external motor pump;
- 6) if there is an internal motor pump, connect the outlet of the softener **(8)** (if there is one) or the water mains **(2)** directly to the machine inlet **(2)**;
- 7) when connecting the tub 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 inspectionable siphon that can be periodically cleaned in order to avoid the backflow of unpleasant odours;
- 9) to avoid oxidization and damage to the machine over time, do not use iron connections for the hydraulic connections, even if they are galvanized.

ATTENTION

If an external tank is used, the connection pipe between the machine and the tank must not exceed 150 cm.

NOTE

In all machines equipped with automatic water filling, there is an automatic time control device which allows the boiler to be filled with water within a maximum period of time. This function keeps water from flowing out of the boiler's valve (flooding) and keeps the motor pump from overheating.

If the maximum time is not enough for the boiler to fill up completely (machines installed with 3 or 4 groups), turn the machine off and then back on, and repeat the operations shown above.

*When the machine is started for the first time, it is advisable to fill the boiler manually using the knob **(14)**.*

3.3 WIRING

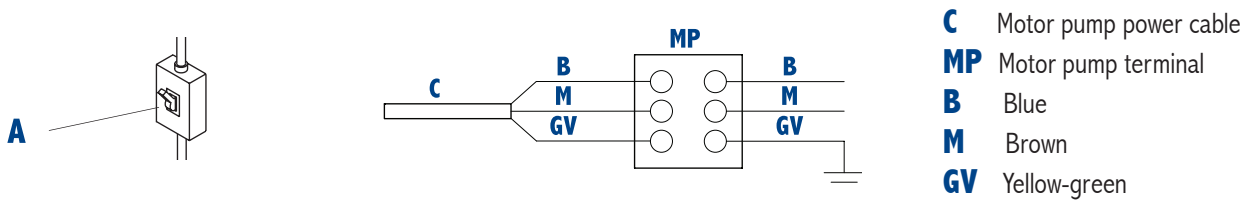
It is necessary to link a safety main switch **(A)** on the electric panel, as required by standard regulations.

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 cable to the motor pump (with a smaller cross section) to the connector as shown in the diagram shown alongside.
- 2) Connect the machine power cable (with larger cross section) as set forth in the chapter “Electrical diagrams”.



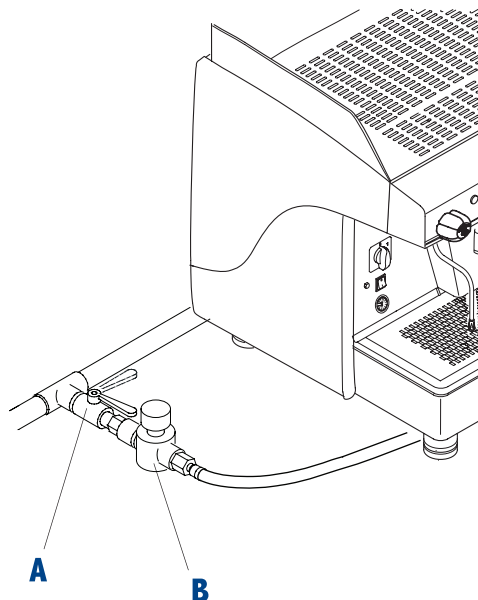
ATTENTION

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.

3.4 GAS CONNECTION (if included)

To perform the connection of the gas system follow the indications below:

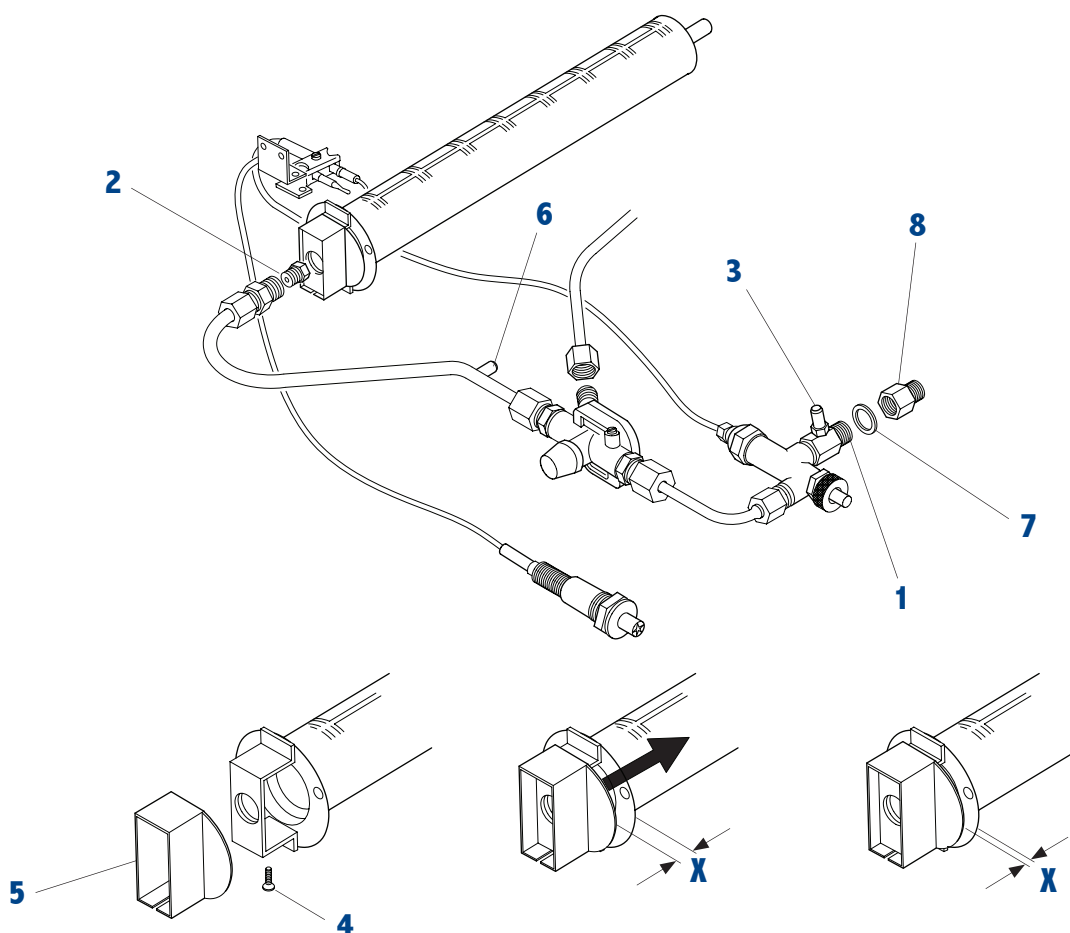
- When operating on gas, the machine emits combustion fumes directly into the surroundings where it is being used; therefore, gas-powered machines must not be installed in rooms with a volume of less than 12 m³, as described by the standards in use;
- Upstream from the machine, a cut-off cock must be installed **(A)**;
- Install a pressure reducer upstream from the gas system **(B)**;
- Pipe connections of the gas to the machine must be made in accordance with current standards in the country of installation using either a flexible or rigid hose.



- Connection is made with a flexible hose:
 - use a hose that meets the standards in use (it is important to replace it periodically as indicated on the tube stamping).
 - the hose must have a maximum length of 1 metre.
 - attach the hose to the connection **(1)**. if necessary, install the conic connector **(8)** and related seal **(7)**.
 - the hoses must not be placed near potential heat sources, they must not reach a temperature higher than 50°C.
 - the hoses must not be subjected to traction or twisting stress, and they must not have any kinks in them. It must be possible to inspect them along their entire length, and they must not come into contact with sharp objects or sharp corners.
- Connecting a rigid hose: connect the Ø8 copper tube Ø8 to the 1/4 gas connection **(1)**.
- Check that the type of gas utilised corresponds to the one indicated on the gas data plate of the machine. In case of different gas, replace the injector **(2)** as indicated in the Gas Table on the next page, and replace the "Preparing gas" label on the boiler cover with that corresponding to the gas used (supplied with the injector). Ensure correct supply pressure by connecting a manometer to the fitting **(3)** and check the air pressure between the input connector to the injector by connecting a pressure gauge (6) See section "Adjusting the gas";
- Check that the air aspiration height **(X)** corresponds to that indicated in the Gas Table on the next page. To carry out any adjustments proceed as follows:
 - loosen the screw **(4)**;
 - move the suction cap **(5)** to the required height.
 - tighten the screw **(4)**.
 If, when starting the burner the colour of the flame is not blue, slightly modify the air aspiration height until the correct colour is obtained.
- As soon as connection is complete, check for any gas leaks by placing a soapy solution on all connections.

ATTENTION

If you need to connect the hose to the machine, we supply a conic fitting **(8)** with seal **(7)** to be installed on the fitting cylinder **(1)**.



GAS Table Indications for the installation of the appropriate injector and the adjustment of the air aspiration cap .

Model	Gas type	Pressure of connection	Min Pressure input injector	Hole for injector of the burner	Adjustment of suction cap of the air	Minimum power Q min	Maximum Power Q n	Maximum consumption	
		mbar	mbar	1/100 mm	mm	kW	kW	m3/h	kg/h
1 Group	G20	20	1,7	100	1	0,47	1,67	0,177	-
	G25	20	1,7	110	1	0,47	1,67	0,177	-
	G25	25	2,4	100	1	0,47	1,55	0,164	-
	G30/G31	28-30/37	3,5	60	3	0,47	1,40	-	0,110
	G30/G31	50	3,5	60	3	0,47	1,80	-	0,142
2 Groups	G20	20	1,9	110	1	0,69	2,03	0,215	-
	G25	20	2,1	135	1	0,69	2,52	0,267	-
	G25	25	2,7	110	1	0,69	1,88	0,199	-
	G30/G31	28-30/37	5,5	75	3	0,69	2,20	-	0,174
	G30/G31	50	6,1	65	3	0,69	2,10	-	0,167
3 Groups	G20	20	2,3	135	1	1,16	3,06	0,323	-
	G25	20	2,3	145	1	1,16	2,91	0,308	-
	G25	25	3,5	135	1	1,16	2,85	0,302	-
	G30/G31	28-30/37	6,1	80	3	1,16	2,51	-	0,199
	G30/G31	50	11,3	75	3	1,16	2,84	-	0,225
4 Groups	G20	20	2,5	145	1	1,30	3,55	0,376	-
	G25	20	2,5	160	1	1,30	3,55	0,376	-
	G25	25	3,8	145	1	1,30	3,30	0,349	-
	G30/G31	28-30/37	6,8	85	3	1,30	2,85	-	0,225
	G30/G31	50	11,3	75	3	1,30	2,85	-	0,225

ATTENTION

Do not under any circumstances attempt to light the gas without first installing the proper injector.
Do not operate the gas burners when the boiler is empty.

ATTENTION

When operating on gas, the machine emits combustion fumes directly into the surroundings where it is being used; therefore, gas-powered machines must not be installed in rooms with a volume of less than 12 m³, as described by the standards in use; In closed rooms, always provide ventilation openings to release any possible gas leaks.

NOTE (FOR ITALY)

The system and installation of the devices must be performed in conformance with the current standards UNI-CIG 8723 of the Decreto Ministeriale dated the 12 April 1996.

ATTENTION (FOR GERMANY)

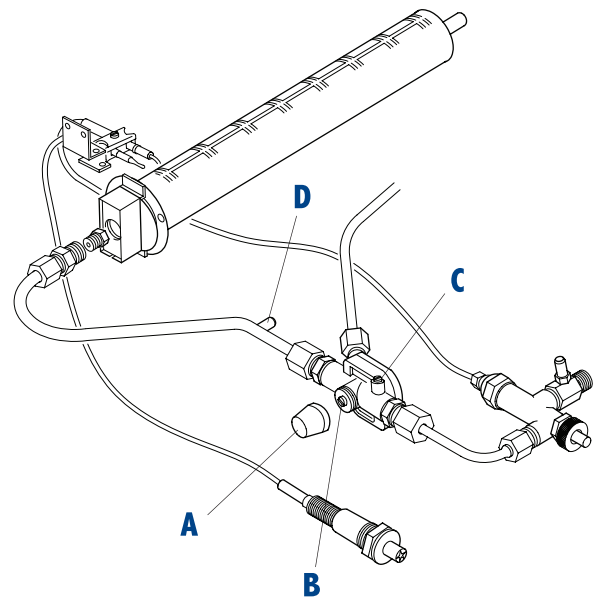
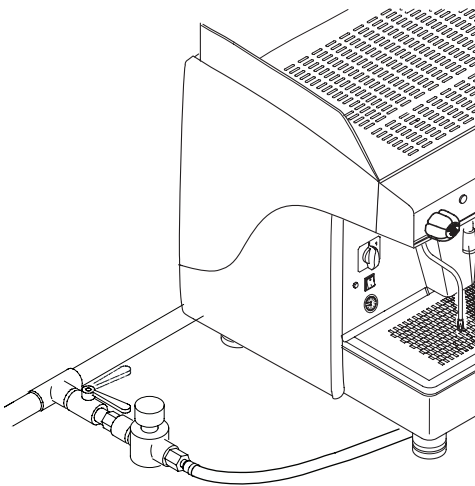
The following requisites must be observed for installation:

- Regulation in terms of work area and the fire department
- Rules in terms of the work place
- Technical rules for suction in terms of fireproofing
- Work sheet DVGW G634 "technical rules for kitchens -gas devices"
- Work sheet DVGW G600 "technical rules for gas installations"
- Technical rules (TRF) for installation with liquid gas
- Rules in terms of accident prevention
- Rules of the Organization that distributes the gas

Gas adjustment

To perform the adjustment of the gas proceed as follows:

- 1) Switch on the gas system;
- 2) remove the locknut **(A)** and loosen the regulator screw **(B)** by 2 turns;
- 3) act on the regulator pin **(C)** in order to have the maximum opening for the flow of gas; wait for boiler pressure to reach 1.4 bar (see boiler pressure gauge);
- 5) act on the regulator pin **(C)** and turn it clockwise until the burner flame is barely visible (pilot flame) and enough to maintain the thermocouple active; check the minimum pressure through a gauge located on the joint **(D)**;
- 6) wait for the pressure in the boiler to reduce down to 1 bar (see boiler pressure gauge);
- 7) act on the adjustment screw **(B)** turning it clockwise until the flame is up to maximum;
- 8) tighten the locknut **(A)** to lock the screw of the regulator **(B)**.
- 9) wait for the operating pressure of the boiler indicated on the pressure gauge of the machine, to reach the working value of about 1-1.2 bar.



If you want to increase or decrease operating pressure in the boiler, proceed as above, varying the parameters as follows:

to decrease:

- obtain a pressure in the boiler of about 1.0-1.2 bar, adjusting the minimum to 0.9 bar and maximum to 1.3 bar.

to increase:

- obtain a pressure in the boiler of about 1.2-1.4 bar (this is the maximum recommended pressure limit), adjusting the minimum to 1.1 bar and maximum to 1.5 bar.

To check the pressure at the inlet of the injector, connect a pressure gauge to the connection **(D)**.

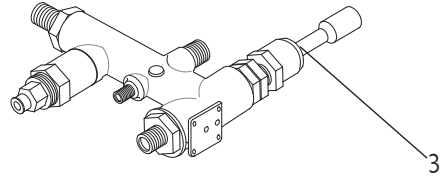
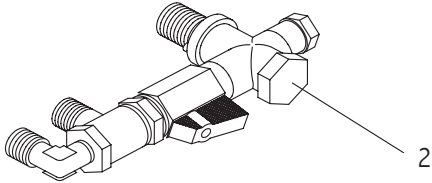
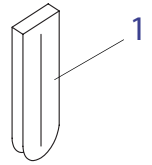
NOTE

The gas system is useful in heating the water in the boiler. It does not, except in special cases, substitute the electrical heating system, but rather works along with it. For machines with levers, operation may be either electric or gas.

3.5 STARTING THE MACHINE

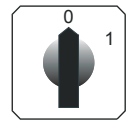
Before starting the machine, make sure that the level of water in the boiler is higher than the minimum level on the level-check window **(1)**. If there is no water (first installation or after boiler maintenance), it is necessary to fill the boiler in advance, so as to prevent overheating of the heating element.

Proceed as follows:



Switch

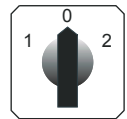
Open the water tap of the water mains and of the softener.
Using manual fill **(2)** fill the boiler with water until the optimal level is restored.
Turn the switch to position “**1**” and wait for the machine to warm up completely.



Switch

Power switch

Open the water tap of the water mains and of the softener.
Turn the switch to position “**1**” (electrical power supplied to the pump for automatic boiler filling and machine services) and wait for the boiler to be automatically filled with water.
Turn the switch to position “**2**” (full electrical power supplied, including the heating element in the boiler) and wait for the machine to warm up completely.



Power switch

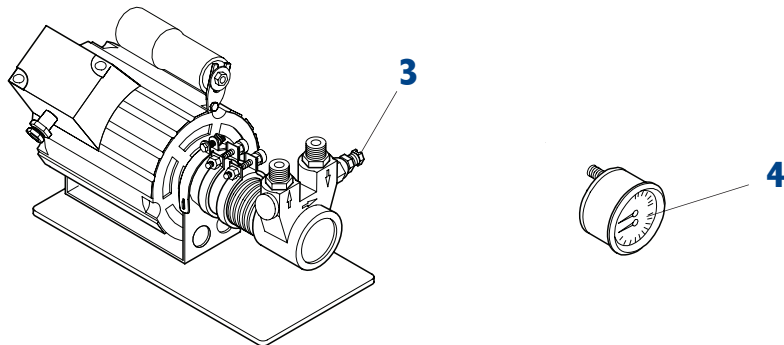
ATTENTION

- 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.
- before using the machine, run dry deliveries with the filter holder attached for a few seconds 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

3.6 EXTERNAL MOTOR PUMP ADJUSTMENT

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 pressure of between 8 and 9 bar. Tightening the screw increases the pressure, and loosening it reduces the pressure. Check the pressure by means of the pressure gauge **(4)** located on the front part of the machine;
- turn off the delivery switch;



3.7 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.

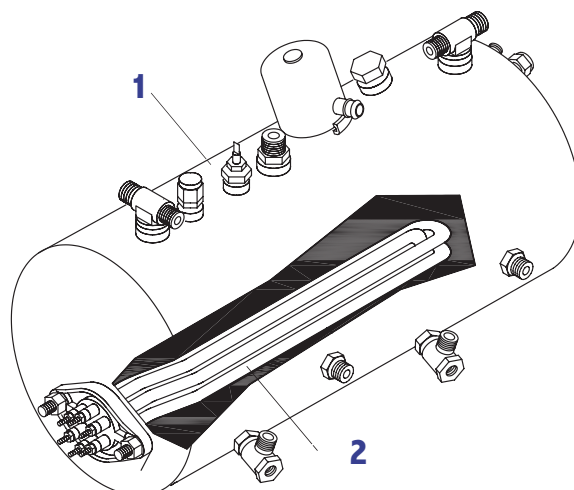
After having reached the “ready to operate” condition, the following operations have to be performed:

- a) 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;
- b) release the whole volume of hot water inside the boiler (3 liters for 1GR, 6 liters for 2GR, 8 liters for 3GR, 11 liters for 4GR), 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;
- c) continuously release steam for at least 1 minute for each steam dispensing point;

When installation is complete, the installer must write a report about the performed operations compiling the Installation Instructions provided with the machine.

4. DISTRIBUTION MACHINE BOILER AND EXCHANGERS

The boiler is constructed in copper sheet metal **(1)**, to which the heat exchangers are assembled which in turn are connected to the delivery group. Water for coffee delivery is taken directly from the heat exchanger. 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.



4.1 ELECTRIC HEATING

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

4.2 GAS HEATING

Gas heating is obtained by supplying the flame of the burner located under the boiler.

4.3 COMBINED GAS + ELECTRIC HEATING

In machines equipped with both systems, it is possible to combine the heating types.

ATTENTION

Do not replace the heating element with a more powerful one. Before making any modifications, contact the manufacturer.

5. COFFEE DELIVERY GROUPS

The delivery group and the heat exchanger are the fundamental components in obtaining espresso coffee. Specifically, the purpose of the group is to dispense the coffee.

5.1 CTS SYSTEM (thermosiphon system)

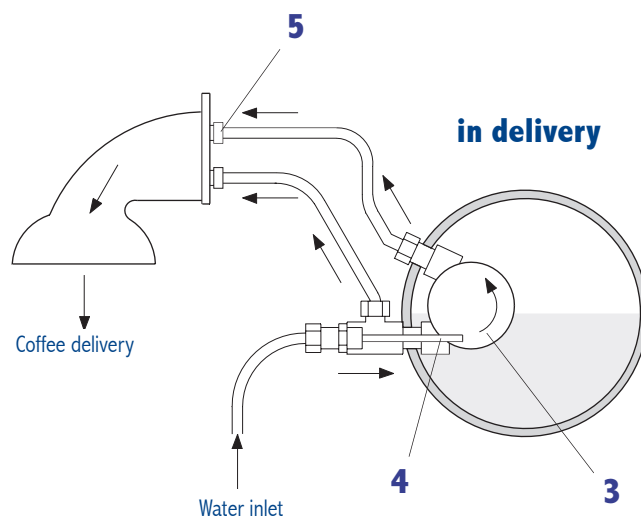
In this system, the delivery group **(1)** is heated by a thermosiphon circuit **(2)** connected to the heat exchanger **(3)**. The same water is used for the coffee delivery, thus ensuring the same temperature for all coffee servings:

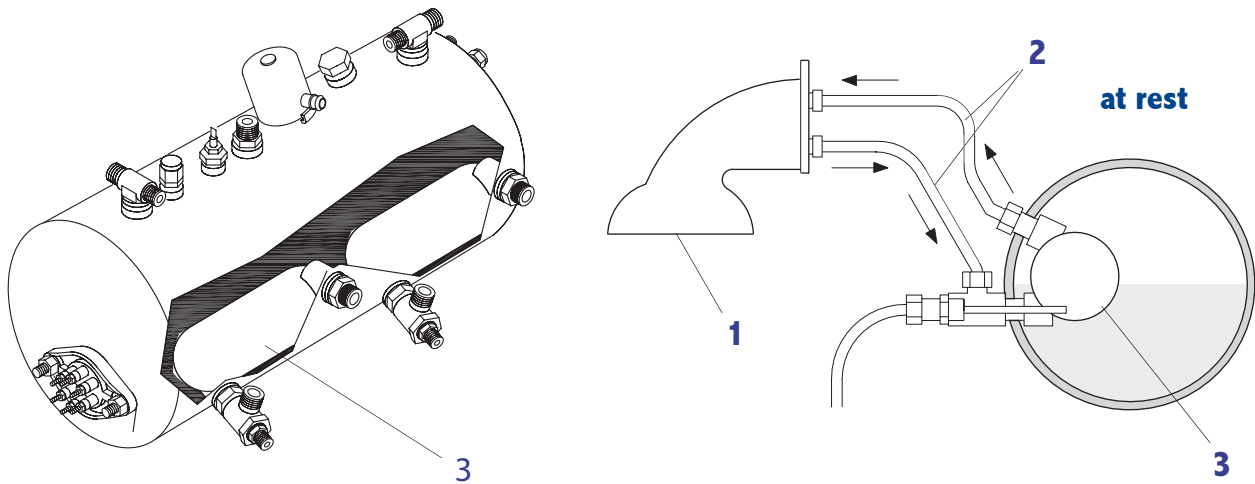
- activation of the solenoid valve and of the pump allow cold water to enter the exchanger **(3)** through the injector **(4)**;
- from the exchanger **(3)** the boiler water is carried to the group **(4)** for delivery;
- the pump allows the increase of the pressure of the water flow up to 8-9 bar for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

If necessary, the exchangers can be replaced by removing the flange and disconnecting the relative pipes of the hydraulic circuit. These operations should be carried out after the machine has been switched down and has cooled off: always replace the seals.

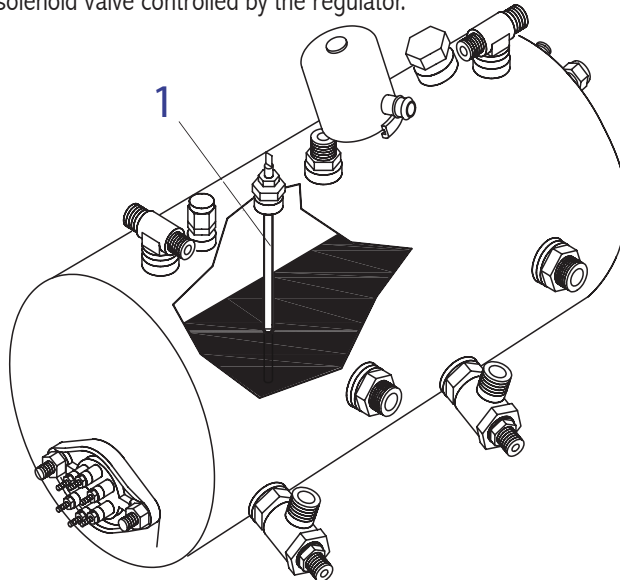




6. AUTOMATIC WATER ENTRY

The Automatic water entry system is for checking the boiler level. It is composed of:

- probe inserted in the boiler **(1)**, composed of a stainless steel rod
- standard control unit **(2)** on SAE machines, electronic level regulator on the other versions **(3)**;
- hydraulic circuit with a solenoid valve controlled by the regulator.



The electronic control unit controls the level of water in the boiler. When the level of water in the boiler drops, the contact with the probe is interrupted. The control unit sends an impulse to the entry solenoid valve and to the motor pump, which act to restore the normal 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 that cuts off automatic filling after a certain time (roughly 2 minutes). The LED **(4)** located on the front of the machine body comes on to indicate activation of this system. During the installation of machines with three or four groups the initial water filling time may exceed the established time limit. In this event, just switch the machine off and then back on to restore normal operating conditions.



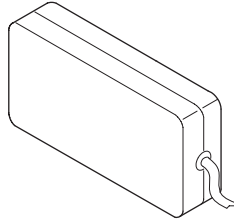
ATTENTION

Always check the level of the water in the boiler by means of the level-check window placed on the front of the machine.

7. ELECTRONIC CONTROL UNIT

The electronic control unit is installed on machines with volumetric dosing device. Its purpose is to electronically control the coffee dose by means of the water flowing through the dosing device and to check the filling of the water in the boiler.

Some versions of the control unit are set up to be connected to the delivery accounting systems by means of a specific interface device.



NOTE

Some units include a button lithium battery.

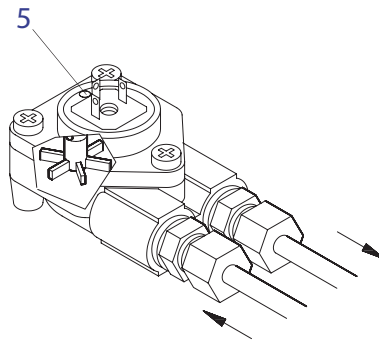
When it needs replacing, disconnect the machine from the power outlet and open the central unit placed inside the equipment. Dispose of the battery in compliance with the collection regulations of the country of use.

8. VOLUMETRIC DOSING

The volumetric dosing device installed on the SAE-SME electronic machines 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.

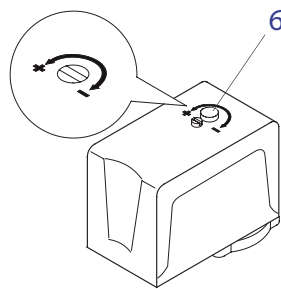
The flashing of the LED **(5)** indicates that the electrical impulse has been sent from the dosing device to the control unit.



9. 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.

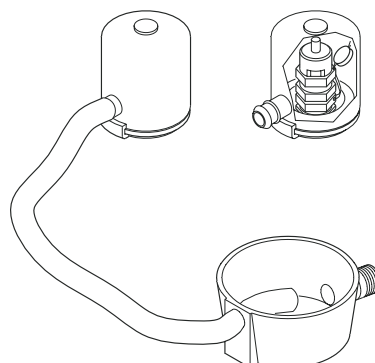


ATTENTION

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

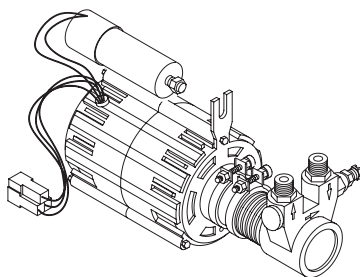
10. ANTI-FLOODING DEVICE

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



11. 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.

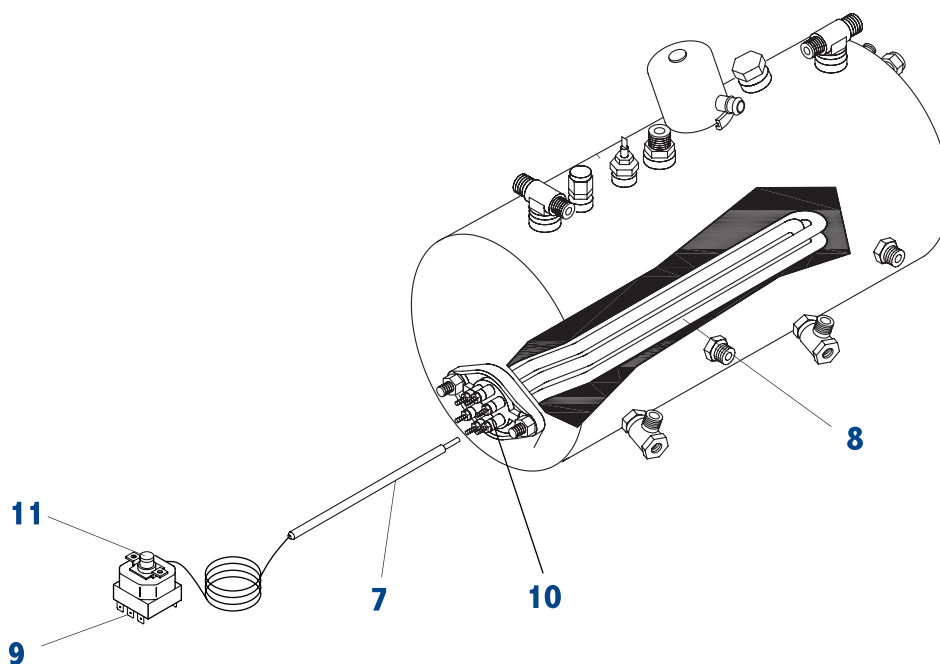


12. THERMOSTAT

The 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 resistance. The contacts of the thermostat (9) are connected to the electrical resistance (10).

If the electrical 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.



ATTENTION

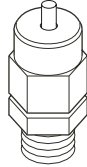
To reset the thermostat, press the center button (11). However, before trying to operate the machine, verify the causes of the blockade of the water feeding the boiler.

13. VALVE GROUP

The valves are devices whose purpose is to ensure the safety and proper operation of the machine.

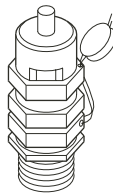
13.1 NEGATIVE PRESSURE VALVE

The 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.



13.2 SAFETY OR PRESSURE RELIEF VALVE

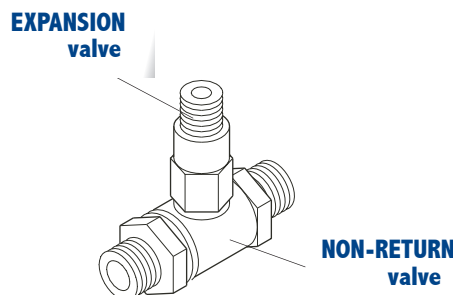
The pressure relief valve guarantees that the pressure in the boiler does not go above 2 bar. In case of failure of the boiler's monitoring system, the valve can eliminate all the excess pressure from the boiler.



13.3 EXPANSION - NON-RETURN VALVE

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

- expansion valve: the cold water sent from the pump to the heat exchangers 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 exchangers in the hydraulic circuit.



NOTE

On all machines with four groups, two pressure relief valves are installed.

14. SOFTENERS

Mains water contains insoluble salts, which cause the build-up of lime scale deposits in the boiler and in other parts of the machine. The softener makes it possible to eliminate or substantially reduce the presence of these mineral salts.

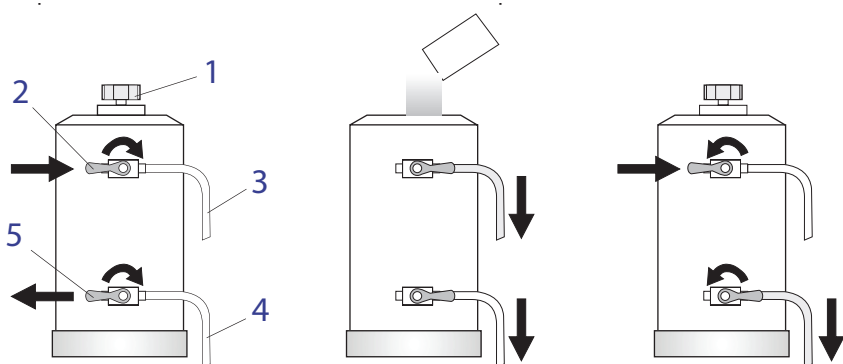
The resin softener has the property of retaining the calcium contained in the water. For this reason, the resins become saturated after a certain period and must be regenerated with coarse kitchen salt (NaCl, sodium chloride) or special water softening salt. It is very important to regenerate the softener within the established times.

The regeneration is to be done regularly every 15 days. However, in locations with very hard water, it will be necessary to regenerate more frequently. The same rule can be applied to places where there is a large consumption of hot water for tea or other uses.

Softener regeneration

Proceed as follows:

- move levers **(2)** and **(5)** from left to right;
- remove the lid by loosening the knob **(1)**;
- release enough water through the pipe **(3)** to make room for the amount of salt as required depending on the model (see table);
- clean any salt or resin residue from the gasket located on the lid;
- put the lid back in place by screwing the knob **(1)** down securely and move the lever **(2)** back from right to left.
- let the salt water drain from the small tube **(4)** until the water is no longer salty (about 30-60 minutes). The salt allows the accumulated mineral salts to be released;
- move the lever **(5)** from right to left back to its initial position.



Modello addolcitore	Quantità di sale
8 litri	1,0 kg
12 litri	1,5 kg
16 litri	2,0 kg

ATTENTION

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 in the boiler may cause long machine shutdowns and in any case invalidate any guarantee, because this symptom indicates that regeneration has been neglected.

In order to keep the softener and hence the machine in perfect operating condition, it is necessary to perform regeneration periodically based on the use of the softener and the hardness of the water that is used.

The table alongside shows the quantity of softened water based on the hardness of the water in the various units of measure:

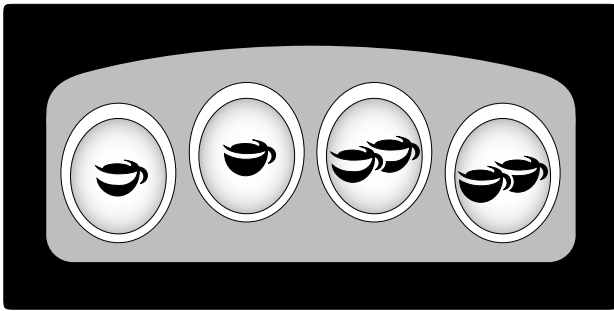
- f°: French degree
- D°: German degree
- mg CaCO₃





Amount of softened water based on hardness					
f°	30°	40°	60°	80°	salt
D°	16.5°	22°	33°	44°	
mg CaCO ₃	300	400	600	800	
8 litres	1000 lt	900 lt	700 lt	500 lt	1.0 kg
12 litres	1500 lt	1350 lt	1050 lt	750 lt	1.5 kg
16 litres	2100 lt	1800 lt	1400 lt	1000 lt	2.0 kg

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

15. ELECTRONIC PUSH BUTTON PANELS

15.1 SAE PUSH BUTTON PANEL



	1 Espresso coffee
	2 Espresso coffees
	1 Long coffee
	2 Long coffees

Coffee delivery

- put the coffee cup under the dispensing spout;
- press the desired dose touch: the dose's red led will also come on;
- wait for coffee to be delivered: the red led will switch off, while all the green led will remain switched on;

NOTA

To stop delivery of coffee in advance, press again the delivery dose key;
In the event of anomalies or if the push button panel is locked, use the manual delivery switch.

16. DISPLAY

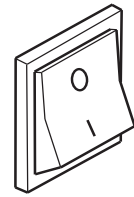


^	Increase
v	Decrease
M	MENU
↵	ENTER

17. COFFEE PREPARATION

17.1 VERSION AEP

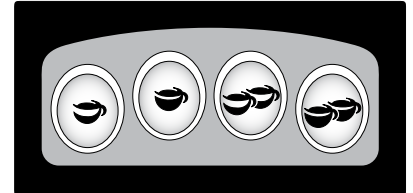
Posizionare la tazza sotto il beccuccio erogazione;
Premere l'interruttore di erogazione: si otterrà l'erogazione caffè, che potrà essere bloccata
Tramite il medesimo interruttore al raggiungimento della quantità desiderata di caffè in tazza.



17.2 VERSION SAE

Coffee delivery




- put the coffee cup under the dispensing spout;
- press the desired dose touch: the dose's red led will also come on;
- wait for coffee to be delivered: the red led will switch off, while all the green led will remain switched on;



NOTA

- *To stop delivery of coffee in advance, press again the delivery dose key;*
- *In the event of anomalies or if the push button panel is locked, use the manual delivery switch.*

Coffee dose programming

- hold down the keys  and  until all dose key led's come on (both red and green);
- press the dose key to be programmed (e.g. 1 espresso coffee ); the dose's green led will blink;
- wait for dispensing; to confirm the dose press again the selected dose key;
- repeat this operation for the other dose keys;
- upon conclusion of the programme, wait until all red led's on the push button come out.

For models with 2-3 groups it is possible to program simultaneously all of the machine push button touch pads using only the right push button touch pad. The programmed doses from the right group will be automatically transferred to the other groups, too. It is however advisable to check the programming of the other push button touch pads.

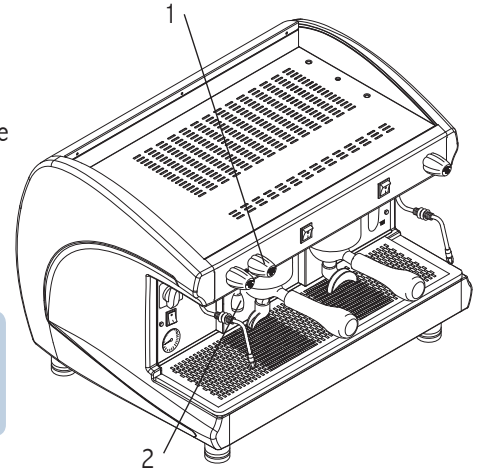
NOTA

The programming of each dose should be made with ground coffee and not with previously used coffee.

18. PREPARATION OF HOT DRINKS

18.1 DISPENSING HOT WATER VERSION AEP

- place the jug under the hot water nozzle **(2)**;
- turn the tap knob **(1)** counterclockwise: the hot water coming out of the nozzle will be proportional to the opening of the tap;
- to interrupt the hot water dispensing turn the knob counter-clockwise **(1)**.

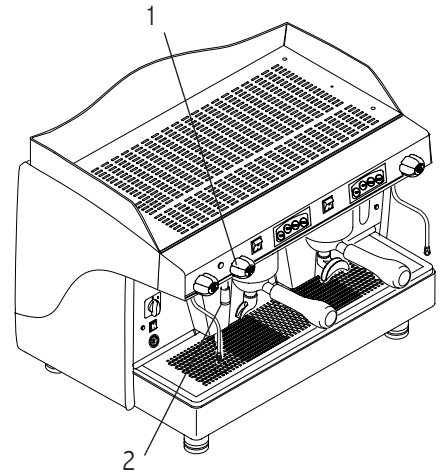


NOTA

Do not touch the hot water nozzle: contact with the hot water may be harmful to people, animals or property.

18.2 DISPENSING HOT WATER WITH KNOB VERSION SAE

- place the jug under the hot water nozzle **(2)**;
- turn the tap knob **(1)** counterclockwise: the hot water coming out of the nozzle will be proportional to the opening of the tap;
- to interrupt the hot water dispensing turn the knob counter-clockwise **(1)**.



NOTA

Do not touch the hot water nozzle: contact with the hot water may be harmful to people, animals or property.

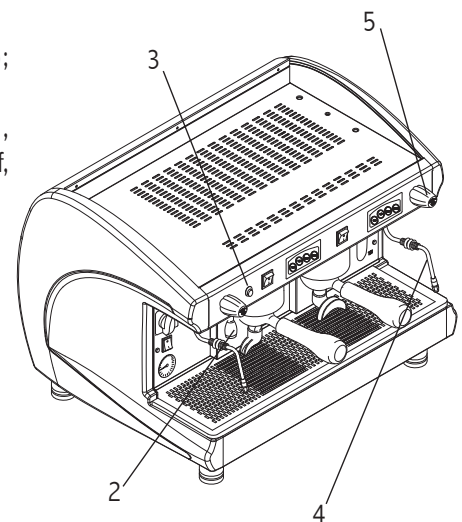
18.3 DISPENSING HOT WATER WITH PUSH BUTTON VERSION SAE

Programming

- hold down the keys ☺ and ☺ until all dose key led's come on (both red and green);
- press the hot water button **(3)**;
- wait until you obtain the desired dose, to confirm press the hot water dispensing button **(3)**,
- when the programming was completed, wait until the red LEDs on the keyboard were off, then the device is ready for use.

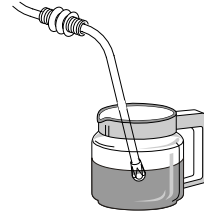
Dispensing hot water

- place the jug under the hot water nozzle **(2)**;
- press the hot water button **(3)**. Wait until the hot water distribution end;
- To stop delivery of hot water in advance, press again the delivery dose key **(3)**.



18.4 DISPENSING STEAM

- immerge the steam-dispensing nozzle **(4)** in the liquid to heat;
- turn the tap knob **(3)** counterclockwise: the steam coming out of the nozzle will be proportional to the opening of the tap;
- to interrupt the steam dispensing turn the knob counter-clockwise **(3)**.



ATTENZIONE

The use of the steam dispensing point (steam nozzle), must always be preceded by the performance of the condensation draining operation for at least 2 seconds.

ATTENZIONE

Leave the steam nozzle immersed in the milk only for the time required for heating. Do not open the steam tap with the steam nozzle immersed in milk while the machine is off.

ATTENZIONE

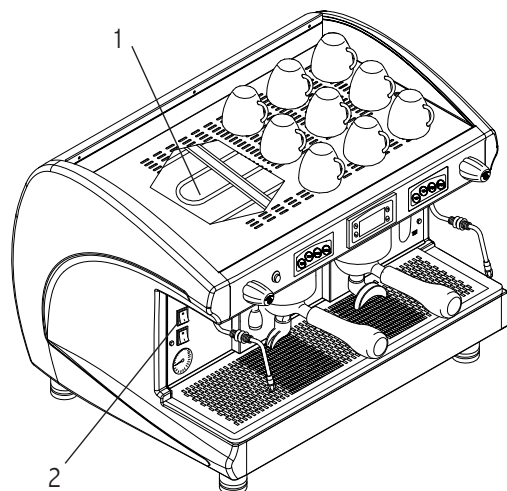
- Carefully operate the steam nozzle using the anti-burn rubber **(3)**: contact with the steam may be harmful to people, animals or property.

19. CUP HEATER

19.1. ELECTRICAL CUP HEATER

The cup heating device is for heating cups before they are used.

- place the cups on the upper surface **(1)** of the coffee machine;
- start the electric heating element with the switch **(2)**.

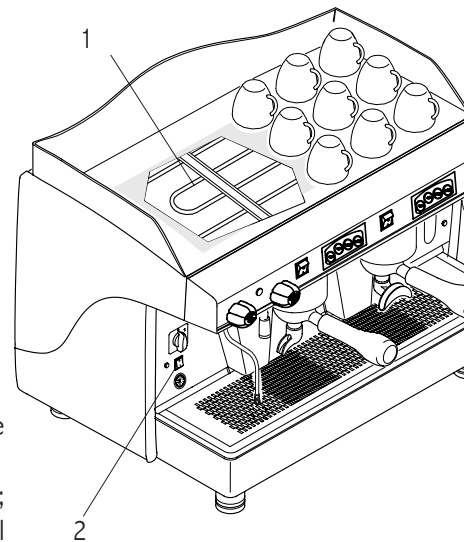


19.2 ELETTRONICAL CUP HEATER

» AEP VERSION

The cup heating device is for heating cups before they are used.

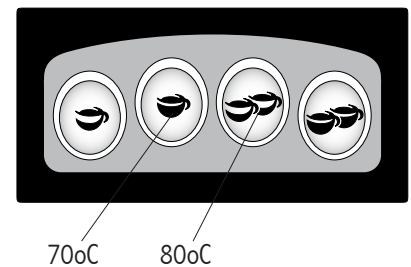
- place the cups on the upper surface **(1)** of the coffee machine;
- start the electric heating element with the switch **(2)**.



» SAE VERSION

To enable, disable or adjust the cup heater proceed as follows:

- hold down the dose keys ☕ and ☕☕ from the right group touch pad, until all the led's stop from blinking;
- if the red led from the key dose (1 espresso ☕) is on, the heating device is switched off;
- to switch it on, push the key dose ☕ ; the led from the same key ☕ dose will become green;
- only when the heating device is switched on, it is possible to modify the temperature by means of the dose keys from the right touch pad, as follows: ☕☕, ☕☕☕ or ☕☕☕☕ .



» DISPLAY VERSION

Place the cups to be heated on top of the cup heater **(1)** and start the electric heating element with the switch **(2)**. To adjust the cup heater, proceed as follows:

- simultaneously press the keys “ v ” and ◀↵ until on display will appear the message “ Password”;
- press the key “M” to enter into the user’s programming menu;
- use the key “ v ” to scroll the menu until reaching the submenu “Cup heater” and press the key ◀↵;
- use the key “ v ” to scroll the menu until reaching the parameter “Temp”;
- use the keys “ v ” and “ ^ ” to modify the temperature shown on the display;
- to exit programming press the “M” key. The machine automatically exits the programming mode if no selections are made for at least 60 seconds.

ATTENZIONE

For safety reasons we advise against putting cloths or other objects on the upper surface **(1)** of the machine as they could obstruct normal air circulation.



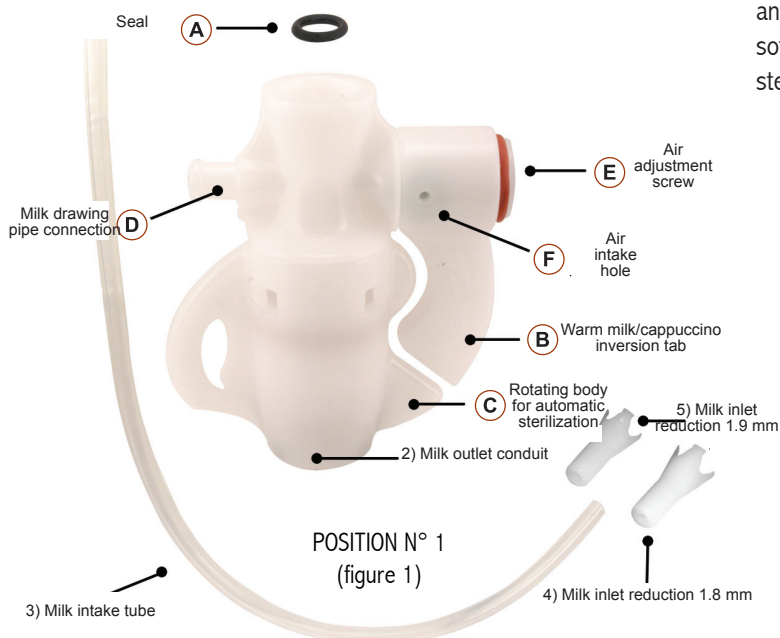
20. CAPPUCCINO MAKER

20.1 INSTALLATION

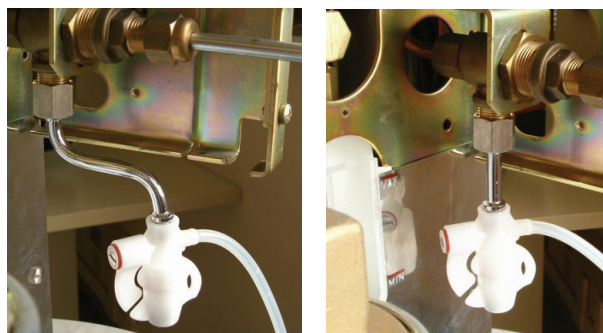
Apply the cappuccino maker, using the appropriate fitting, directly to the steam spout, replacing the original sprayer, or with the appropriate pipe, directly to the steam tap of your machine.

Ensure that seal A is present and/or use Teflon tape in order to avoid steam loss which may compromise the cappuccino makers operation. Insert the milk drawing pipe 3 into the appropriate connection D of the cappuccino maker.

The cappuccino maker is now ready for use. It is easy to use, and with 3 simple gestures you can: foam the milk, obtaining a soft and silky cream; simply warm the milk or carry out automatic sterilization!

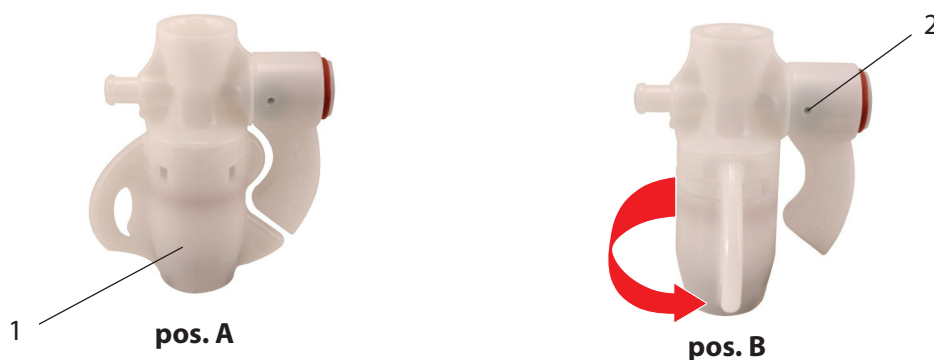


Cappuccino maker installation examples



Cappuccinatore

- Put the suction tube inside the milk;
- Place the jug under the spout of the cappuccino maker;
- Turn the steam tap counterclockwise, when the desired amount is reached close the steam tap;
- Put the latte into the cups with the coffee.



ATTENTION

It is advisable to clean the cappuccino maker after each use in order to avoid malfunctions and ensure a high degree of igienità system.

Do not unscrew the cappuccino from the steam wand.

20.2 CLEANING

The first time you use the cappuccino maker, it is important to clean it: turn the rotating body C 90° and place the cappuccino maker in position 2 (**pos. B**). Doing this closes the milk outlet conduit. While holding the silicone tube 3, open the steam of your machine: the steam will enter all of the internal cavities of the cappuccino maker. A small amount comes out of the air intake hole F and is discharged from pipe 3, cleaning and sterilizing it as well. Thorough cleaning only takes about 15-20 seconds.

Close off the steam and restore position 1 (**pos. A**) of the cappuccino maker.

It is a good idea to clean after each continuous use: you will prevent yellowing of the tube 3 and the clogging of the cappuccino maker.

Make sure that the hole F is free of clogs: if it is, clean it delicately with a pin.



20.3 CAPPUCINO

Ensure that the cappuccino maker is in position 1 (**fig.1**). Open up the steam by using a screwdriver to turn screw E counter-clockwise until the milk starts to spray: this means that there is an excess of air. Slightly close the air by turning the screw clockwise. As soon as the milk stops spraying and the flow becomes steady it means that the cappuccino maker is properly adjusted for producing a soft, dense cream without macro-bubbles.

The adjustments are maintained also for subsequent cappuccinos, guaranteeing a cream that is always perfect, just like the first one.

This operation should be performed carefully because excessive air, indicated when the milk sprays, does not allow you to get the best possible performance: the cream will have rather large bubbles in it, and there will be more of it but it will be less dense!

A good cappuccino should be served with a dense, compact and silky cream.



20.4 WARM MILK

Without modifying the air adjustment, from position 1 (**fig.1**) lift tab B upwards (**fig.3**). Opening up the steam on your machine will give you warm milk without foam.

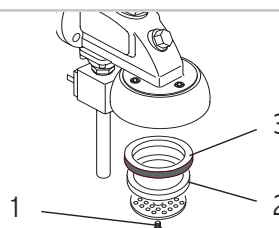
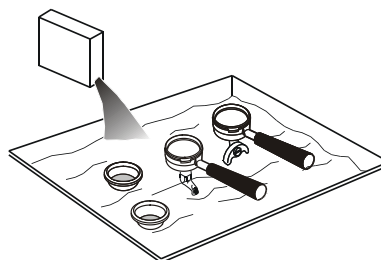
TABLE of TEMPERATURES WITH and WITHOUT REDUCTIONS (temperatures measured in a pre-heated cup)			
Milk temperature (bottle)	Without use of choke	With choke 1.9 mm	With choke 1.8 mm
Room temperature 16°C	55 - 60 °C (131 - 140 °F)	60 - 68 °C (140 - 154 °F)	68 - 75 °C (154 - 167 °F)
Chilled milk 6°C	48 - 56 °C (118 - 133 °F)	58 - 63 °C (136 - 145 °F)	63 - 70 °C (145 - 158 °F)



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.

Pulizia	Giornal.	Settim.
<p>FILTERS and PORTAFILTERS The filters and filter-holders must be cleaned daily in hot water. The best thing to do is to let them soak in hot water overnight so that the fatty coffee deposits can dissolve. It is advisable to add special detergent to the water, and then to rinse everything off with water. Failure to clean the filter holders daily will compromise the quality of the coffee and the filterholder correct operation.</p>	X	
<p>BODY Clean the panels of the body with a cloth dampened in lukewarm water. Do not use abrasive detergents which may scratch the surface of the body.</p>	X	
<p>STEAM NOZZLE Clean the steam nozzles making a quick delivery till empty after each use and clean with a cloth dampened with warm water.</p>	X	
<p>DELIVERY GROUP Wash the units as indicated: use the solid portafilter; pour the special detergent (see spare parts) into the solid filter and attach the filter holder; carry out a series of deliveries until the water comes out clean; remove the portafilter from the unit and carry out at least one delivery so as to eliminate the detergent residue.</p>	X	
<p>PERFORATED DISK and CONTAINMENT RING Clean the perforated disk (2) and its containment ring (3) in hot water. To do this, loosen the screw (1) and remove the two elements from the dispensing unit</p>		X
<p>STEAM NOZZLE Check and clean the terminals of the steam nozzles, using a small needle to reopen the exit holes.</p>		X
<p>GRINDER-DOSER Every week clean the bell jar and the dosing device with a cloth soaked in lukewarm water, both inside and out, then dry it.</p>		X



ATTENTION

- *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 immerse 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 dismantling the components with deposits, so that no descaling debris are put into circulation. The used products/ detergents have to be suitable for this purpose and must not corrode the materials of the hydraulic circuits.*

22. CHECKS AND MAINTENANCE

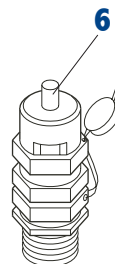
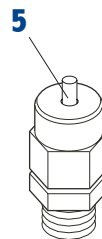
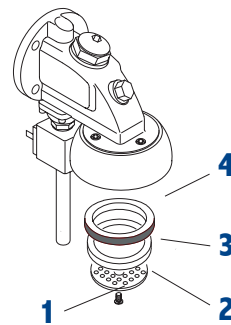
To ensure perfect safety and efficiency of the machine over time, it is necessary to carry out routine, preventive and special maintenance. In particular, it is advisable to carry out an overall check of the machine at least once a year.

ATTENZIONE

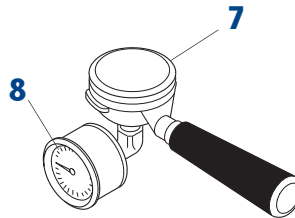
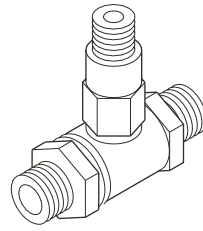
After ta maintenance and/or repair intervention, the components used must ensure that the hygiene and safety requirements initially foreseen for the appliance are still met. These are met by using original spare parts only.

After 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.

INTERVENTION	Weekly	Monthly	Yearly
<p>MACHINE</p> <p>Carry out the cleaning as described in the previous chapter.</p>	X		
<p>MACHINE</p> <p>Every four months replace the perforated disk (2) and the undercup seal (4) of the delivery group (use only original spare parts) proceeding as follows:</p> <ol style="list-style-type: none"> 1) loosen the screw (1); 2) remove the containment ring (3); 3) replace the perforated disk of the group (2) and the rubber seal under the pad (4); 4) reassemble the components. 		X	
<p>VALVES</p> <p>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. For the checks, proceed as follows:</p> <p>NEGATIVE PRESSURE VALVE</p> <ol style="list-style-type: none"> 1) first try : <ul style="list-style-type: none"> - 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 : <ul style="list-style-type: none"> - 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. <p>SAFETY OR PRESSURE RELIEF VALVE</p> <ol style="list-style-type: none"> 1) first try : <ul style="list-style-type: none"> - 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 : <ul style="list-style-type: none"> - 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






INTERVENTION	Weekly	Monthly	Yearly
<p>NON-RETURN DRAIN VALVE</p> <ul style="list-style-type: none"> - 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 and the seal of the gaskets and solenoid valves; - de-activate the deliveries; - repeat the control on the other delivery groups. 			X
<p>GAUGE</p> <p>Monitor the boiler pressure value as explained in chapter 1, "Technical Characteristics".</p>	X		
<p>GAUGE</p> <p>Periodically check water pressure during coffee delivery: check the pressure indicated on the gauge, which must be between 8 and 9 bar inclusive.</p>		X	
<p>FILTERS and FILTER HOLDERS</p> <p>Check the condition of the filters. Check for any damage on the edge of the filters and check whether any coffee grounds settle in the coffee cup.</p>		X	
<p>GRINDER-DOSER</p> <p>Check the dose of ground coffee (between 6 and 7 gr. per stroke) and check the degree of grinding. The grinders must always have sharp cutting edges. Their deterioration is indicated by the presence of too much powder in the grounds. You should replace the flat grinders after every 400/500 kg of coffee. For conical grinders, replace every 800/900 kg.</p>		X	
<p>SOFTENER</p> <p>The build-up of lime scale deposits in the hydraulic circuit of the machine indicates that regeneration has been neglected. Carry out maintenance of the boiler and of the hydraulic circuit, replacing any components as required. Use care in areas where the water is very hard. It will be necessary to regenerate at more frequent intervals, likewise if there is high consumption of hot water for tea and so forth.</p>		X	
<p>PRESSURE GAUGE AND PRESSURE SWITCH</p> <p>Check for proper operation of the pressure gauge and pressure switch.</p>			X
<p>HYDRAULIC CIRCUIT</p> <p>Check for lime scale deposits on the heating element, on the exchanger (inside and out) and on the hydraulic circuit. When replacing any components, always replace the relative gasket as well.</p>			X
<p>DISPENSER UNIT</p> <p>Check the condition of the solenoid valve of the delivery group.</p>			X
<p>DRAIN</p> <p>Check for trace water leaks on the counter. Also check the condition of the discharge tub and its connection to the sewer system.</p>			X




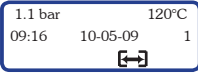




23. MALFUNCTIONS AND CORRESPONDING SOLUTIONS

Indication	Cause	Solution
MACHINE LACKING POWER	<ol style="list-style-type: none"> 1) The machine power switch is in position "0" or "1" 2) The machine switch is defective 3) The mains power supply switch is in the OFF position 4) The connection to the electrical mains is defective 	<ol style="list-style-type: none"> 1) Turn the machine power switch to position "2" 2) Replace the main switch 3) Place the mains switch in the ON position 4) Check for any defective connections
NO WATER IN BOILER	<ol style="list-style-type: none"> 1) The water mains tap is closed 2) The cut-off tap of the automatic level device is in the closed position 3) The pump filter is clogged 4) The motor pump is disconnected or jammed 5) The water filling solenoid valve is defective 6) The water inlet solenoid valve filter is clogged 	<ol style="list-style-type: none"> 1) Open the water mains tap 2) Open the automatic level device tap 3) Replace the pump filter 4) Check the motor pump 5) Replace the water filling solenoid valve 6) Clean or replace the filter of the solenoid valve
TOO MUCH WATER IN THE BOILER	<ol style="list-style-type: none"> 1) The solenoid valve of the automatic level device is defective 2) The heat exchanger is perforated 	<ol style="list-style-type: none"> 1) Replace the solenoid valve of the automatic level device 2) Replace the exchanger
STEAM DOES NOT COME OUT OF NOZZLES	<ol style="list-style-type: none"> 1) The electrical heating element is defective 2) The pressure switch contacts are oxidized 3) The heating element protection thermostat has cut in 4) The nozzle sprayer is clogged 5) Machine switch in position "1" 	<ol style="list-style-type: none"> 1) Replace the electrical heating element 2) Clean the contacts or replace the pressure switch 3) Reset the heating element protection 4) Clean the steam nozzle sprayer 5) Turn the machine switch to position "2"
STEAM MIXED WITH WATER COMES OUT OF THE NOZZLES	The boiler level is too high	Check the status of the level probe: verify correct position and check for presence of any surface lime scale
NO DISPENSING	<ol style="list-style-type: none"> 1) No water mains 2) Group solenoid valve is defective 3) The pump is jammed 4) The control unit fuse is burned out 5) The injector is clogged 6) The group solenoid valve is clogged or dirty 7) The group filter is clogged 8) The volumetric dosing device is blocked 	<ol style="list-style-type: none"> 1) Check that there is water in the mains 2) Replace the group solenoid valve 3) Replace the pump 4) Replace the solenoid valve protection fuse (1A) 5) Clean or replace the injector 6) Clean or replace the solenoid valve 7) Clean or replace the filter 8) Check/replace the dosing device
WATER LEAKAGE FROM THE MACHINE	<ol style="list-style-type: none"> 1) The tub does not drain 2) The drain tube is broken or detached or has an obstruction in the water flow 3) Hydraulic leaks in the hydraulic circuit 	<ol style="list-style-type: none"> 1) Check the sewer drain 2) Check and restore the connection of the drain tube to the tub 3) Identify and eliminate any hydraulic leaks
COFFEE TOO COLD	<ol style="list-style-type: none"> 1) The electrical heating element is defective 2) The electrical connection is defective 3) Lime scale on the exchangers and/or heating element 4) The pressure switch contacts are oxidized 5) The heating element protection thermostat has cut in 6) Machine switch in position "1" 7) In the CTS system, the lime scale has reduced the circulation of water 8) The delivery group is cold 	<ol style="list-style-type: none"> 1) Replace the electrical heating element 2) Check for any defective connections 3) Clean the machine 4) Clean the contacts or replace the pressure switch 5) Reset the resistance safety device 6) Turn the machine switch to position "2" 7) Clean the connections of the exchanger, and clean or replace the two circulation tubes 8) Eliminate air pockets in the hydraulic circuit in the following manner: <ul style="list-style-type: none"> - disconnect the electrical power supply to the pump - close the water tap of the softener - perform a dry delivery run for a few minutes - reconnect the electrical power supply to the pump - open the water outlet tap of the softener - perform delivery until water comes out - wait a few minutes for heating

Indication	Cause	Solution
COFFEE IS TOO HOT	1) The boiler temperature is too high 2) The flow reducer of the group is unsuitable	1) Reduce the pressure in the boiler using the appropriate screw on the pressure switch 2) Replace the reducer with one of a smaller diameter
COFFEE DISPENSED TOO QUICKLY	1) Coffee is ground too coarsely 2) The diameter of the injector is too large	1) Adjust the grinding of the coffee 2) Replace the injector with one of a smaller diameter
COFFEE DISPENSED TOO SLOWLY	1) Coffee is ground too fine 2) The injector is clogged 3) The delivery group is clogged 4) The filter holder is dirty	1) Adjust the grinding of the coffee 2) Replace the injector 3) Check and clean the delivery group 4) Clean and if necessary replace the 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 unit drain 2) Wait for the group to heat up completely 3) Adjust the grinding of the coffee
THE PRESSURE GAUGE INDICATES AN UNACCEPTABLE PRESSURE	1) The pressure gauge is defective 2) Incorrect pressure switch calibration 3) Incorrect motor pump calibration	1) Replace the pressure gauge 2) Adjust the calibration of the pressure switch 3) Adjust the calibration of the motor pump
GROUNDS IN CUP	1) The filter holder is dirty 2) The filter holes are worn 3) The coffee is not ground evenly 4) The undercup seal is worn 5) The pressure in the pump is too high	1) Clean the filter holder 2) Replace the filter 3) Replace the grinders 4) Change the seal 5) Adjust the pressure of the pump
for SAE : COFFEE DELIVERY OCCURS ONLY USING THE MANUAL BUTTON	1) The control unit fuse is burned out 2) The coil of the solenoid valve doesn't work correctly or is in short circuit	1) Replace the control unit fuse (1A) 2) Replace the coil of the solenoid valve
for SAE-SME: 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 defective 2) The connection of the electronic control unit is defective 3) The connector of the volumetric dosing device has humidity on it 4) The volumetric dosing device is defective: during delivery the dosing device LED does not flash 5) The coffee is ground too fine: there is not sufficient water flow in the dosing device 6) The non-return valve loses 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 at rest 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 8/10-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 if necessary check the grinders 6) Check and if necessary replace the non-return valve 7) Check and if necessary replace the expansion valves 8) Clean and if necessary replace the solenoid valve 9) Clean or replace the volumetric dosing device
for SAE-SME: ALL THE LED'S OF ALL THE PUSH BUTTON PANELS ARE FLASHING for AEP-SMSA AEAP-SMAT: THE FRONT LED IS FLASHING	After a few minutes, automatic filling with water is stopped: 1) Time control device has cut in 2) No water in mains 3) The tap for the automatic level device is closed 4) Some of the tubes in the circuit are clogged 5) The probe and/or the earth are disconnected	1) Turn the machine off and then back on 2) Open the water mains tap 3) Open the automatic level device tap 4) Check and replace the defective tubes 5) Check and restore connections
POWER LED TIME-OUT	After a few minutes, automatic filling with water is stopped 1) Time control device has cut in 2) No water in mains	1) Turn the machine off and then back on 2) Open the water mains tap

Indication	Cause	Solution
THE PUMP WORKS ONLY WITH THE MANUAL DELIVERY BUTTON	1) The pump fuse of the electronic control unit is burned out	1) Replace the pump fuse of the electronic control unit (10 A)
SHUTDOWN OF THE ELECTRONIC SYSTEM	1) The control unit fuse is burned out 2) The volumetric dosing device has a contact of the positive pole to the earth	1) Replace the main fuse (125 mA) 2) Check the connection of the volumetric dosing device
THE PUMP LEAKS WATER	1) Poor mechanical seal of the shaft or the O-ring seal 2) The inlet and outlet connections are loose 3) The hex nut of the pressure relief valve or the filter is loose 4) The seal or O-ring of the pressure relief valve or the filter is defective.	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 the filter 4) Replace the seal and O-ring. Take care not to change the calibration of the valve
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 the motor are not aligned 3) The motor is defective 4) The motor is connected with a incorrect voltage	1) Check the status of the pump and replace it, if necessary 2) Install the pump-motor joint 3) Replace the motor 4) Ensure that the power supply voltage of the motor is correct
LA POMPA FUNZIONA AL DI SOTTO DELLA PORTATA NOMINALE	1) L'ingresso è occluso anche parzialmente 2) Il senso di rotazione della pompa è errato 3) La valvola limitatrice è starata 4) Il motore ha un basso numero di giri/min 5) L'interno della pompa è danneggiato a causa dell'entrata di materiali estranei	1) Pulire il portafiltro 2) Controllare il motore 3) Tarare la valvola limitatrice 4) Controllare la tensione o sostituire il motore 5) Sostituire la pompa
THE PUMP IS NOISY	1) The pump and the motor are not aligned 2) The seal or O-ring of the pressure relief valve or the filter is defective. 3) The joint, the coupling screw or the V-shaped clamp is loose. 4) The inlet is clogged, perhaps only partially 5) The hex nut of the pressure relief valve or the filter is loose	1) Install the pump-motor joint 2) Replace the seal and O-ring. Take care not to change the calibration of the valve 3) Align and tighten the components which are loose 4) Clean the inlet pump filter 5) Tighten the hex connection of the pressure relief valve and the 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 finely 4) The flow reducer of the group is not suitable	1) Reduce the water temperature 2) Check the cause and eliminate the problem 3) Adjust the grinding suitably 4) Replace the flow reducer
ON DISPLAY BLINKS THE ALARM: 	Boiler temperature's NTC probe malfunction.	Request assistance from the authorized personnel.
ON DISPLAY BLINKS THE ALARM: 	Cup heater's NTC probe malfunction.	Request assistance from the authorized personnel.
ON DISPLAY BLINKS THE ALARM: 	The number of brewed coffees has reached the value set as pre-prealarm or prealarm.	Verify the remained numbers of coffee to be prepared. Inform the authorized personnel.

<p>COFFEE PREPARATION IS DISABLED AND ON DISPLAY REMAINS FIX THE ALARM:</p> 	<p>The value set as "Credit" reached zero.</p>	<p>Request assistance from the authorized personnel.</p>
<p>ON DISPLAY BLINKS THE ALARM:</p> 	<p>The machine has consumed the water quantity set as "Preal."</p>	<p>Inform the authorized personnel.</p>
<p>ON DISPLAY REMAINS FIX THE ALARM:</p> 	<p>The machine has consumed the water quantity set as "Thres."</p>	<p>Request assistance from authorized personnel in order to make the water softener regeneration.</p>
<p>ON DISPLAY BLINKS THE ALARM:</p> 	<p>Connection error main board - display's appendix.</p>	<p>Request assistance from the authorized personnel.</p>
<p>ON DISPLAY REMAINS FIX THE ALARM:</p> 	<p>Connection error main board - display's and keyboard - display.</p>	<p>Request assistance from the authorized personnel.</p>
<p>ON DISPLAY REMAINS THE ALARM:</p> 	<p>Malfunction of the electrical system, the supply wires aren't properly connected.</p>	<p>Request assistance from the authorized personnel.</p>

ATTENTION

If the problem cannot be resolved, turn the machine off and contact Technical Service. Do not attempt any sort of repairs. Before you perform any action, disconnect the machine from the mains.

23. LIST OF HAZARDS

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

The appliance must be connected to an efficient grounding system

If this is not done, the appliance can be a source of dangerous electrical discharges 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 parts of the body.

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.

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.

Gas machines

Periodically check for gas leaks in the system by applying a soapy solution to the ducts.

For safety reasons, close the gas heating system when the machine is not in use (at night or during hours of closure)

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 work on the electronic apparatus when the machine is still supplied with electrical energy.

Shut down the machine completely by disconnecting it from the mains before carrying out any operation.

ATTENTION

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.

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL
instructions for the technician

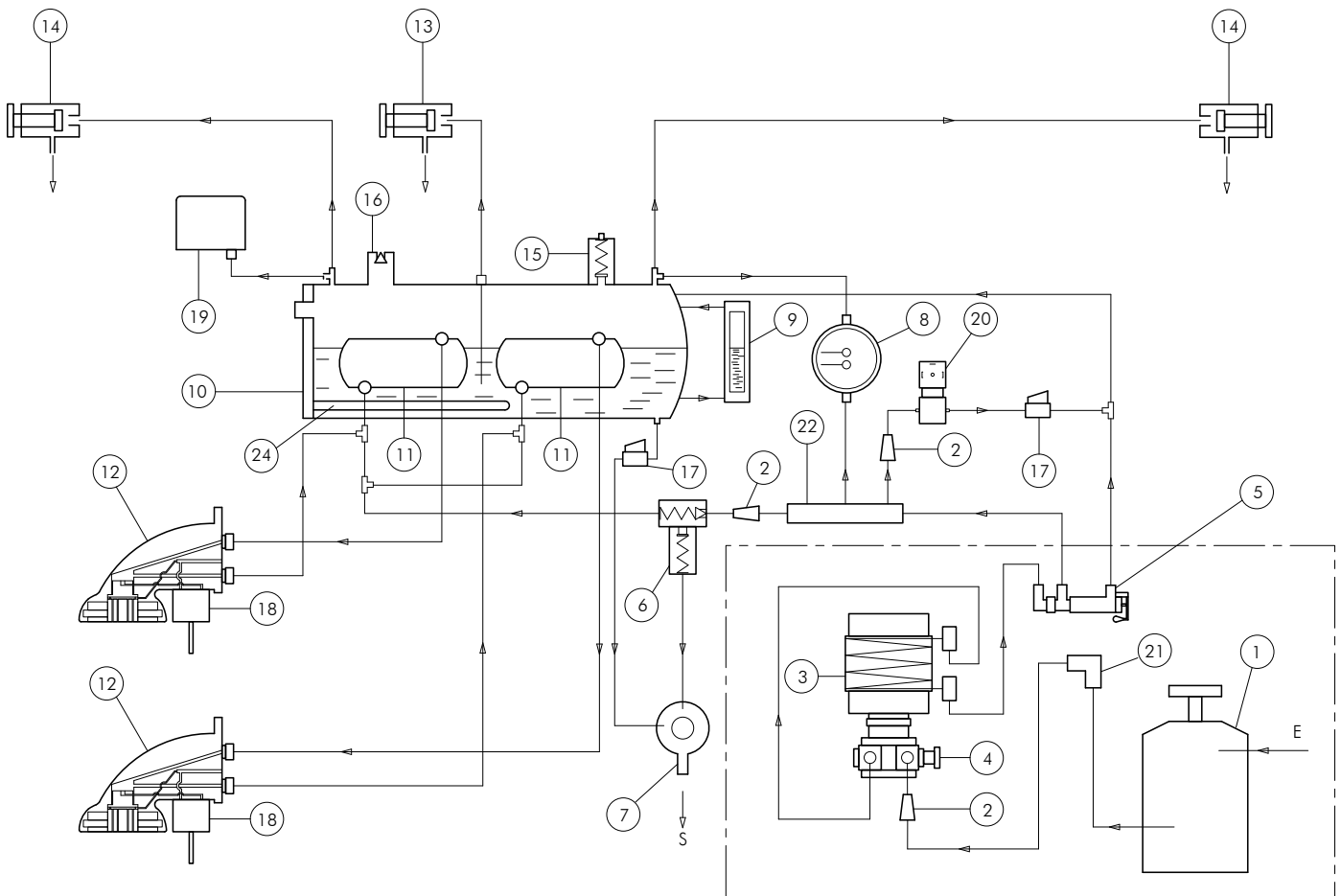
HYDRAULIC DIAGRAMS

ENGLISH

Summary

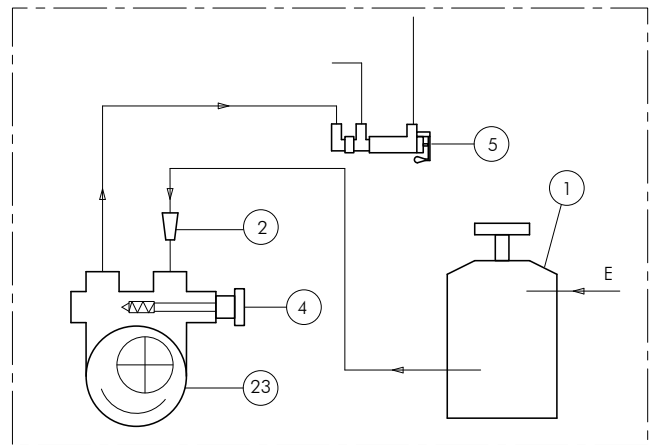
1. AEP CTS SYSTEM HYDRAULIC DIAGRAM	47
2. SAE CTS SYSTEM HYDRAULIC DIAGRAM	49

1. AEP CTS SYSTEM HYDRAULIC DIAGRAM



Internal motor pump

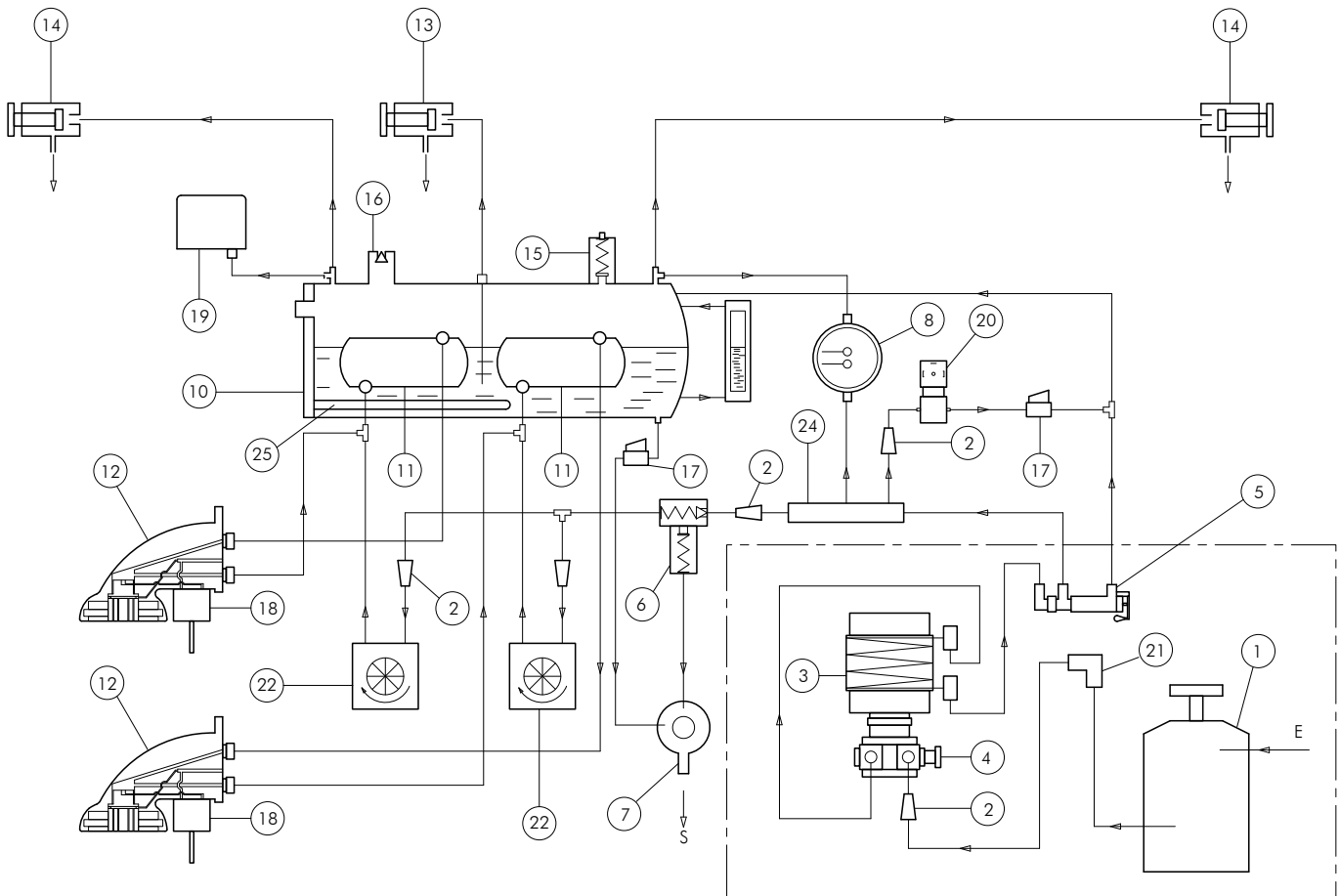
- 1** Water softener
- 2** Water inlet filter
- 3** Built-in motor pump
- 4** Pump pressure adjustment
- 5** Manual water entry tap
- 6** SCNR valve
- 7** Drain tub
- 8** Gauge
- 9** Level-check window
- 10** Boiler
- 11** Heat exchanger
- 12** Delivery group
- 13** Hot water tap
- 14** Steam tap
- 15** Safety valve
- 16** Negative pressure valve
- 17** Boiler drain tap
- 18** Group solenoid valve
- 19** Pressure switch
- 20** Automatic Water Inlet solenoid valve
- 21** Water inlet connection
- 22** Water distributor
- 23** External motor pump
- 24** Boiler heating element



External motor pump

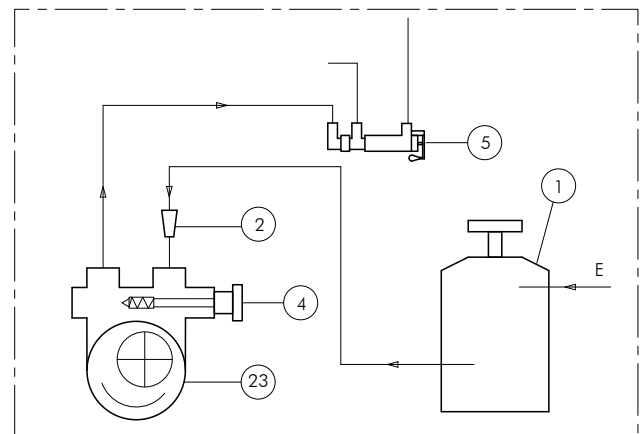
- E** Water inlet
- S** Drain

2. SAE CTS SYSTEM HYDRAULIC DIAGRAM



- 1** Water softener
- 2** Water inlet filter
- 3** Built-in motor pump
- 4** Pump pressure adjustment
- 5** Manual water entry tap
- 6** SCNR valve
- 7** Drain tub
- 8** Gauge
- 9** Level-check window
- 10** Boiler
- 11** Heat exchanger
- 12** Delivery group
- 13** Hot water tap
- 14** Steam tap
- 15** Safety valve
- 16** Negative pressure valve
- 17** Boiler drain tap
- 18** Group solenoid valve
- 19** Pressure switch
- 20** Automatic Water Inlet solenoid valve
- 21** Water inlet connection
- 22** Volumetric dosing device
- 23** External motor pump
- 24** Water distributor
- 25** Boiler heating element

Internal motor pump



External motor pump

E Water inlet
S Drain

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL
instructions for the technician

ELECTRICAL DIAGRAMS

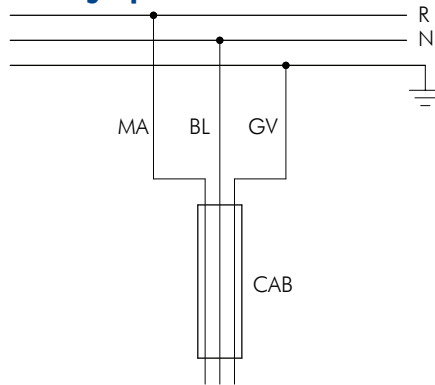
ENGLISH

Summary

1. ELECTRICAL DIAGRAM ELECTRICAL MAINS CONNECTION.....	55
2. ELECTRICAL DIAGRAM MACHINE POWER SUPPLY	56
3. ELECTRICAL DIAGRAM COD 18080000.....	57
4. ELECTRICAL DIAGRAM VERSION AEP	58
5. ELECTRICAL DIAGRAM COD. 18088000 - 18088001	59
6. ELECTRICAL DIAGRAM COD. 18088002 - 18088003	61
7. ELECTRICAL DIAGRAM COD. 18088004 - 18088005.....	63
8. ELECTRICAL DIAGRAM COD. 18088006 - 18088007	65

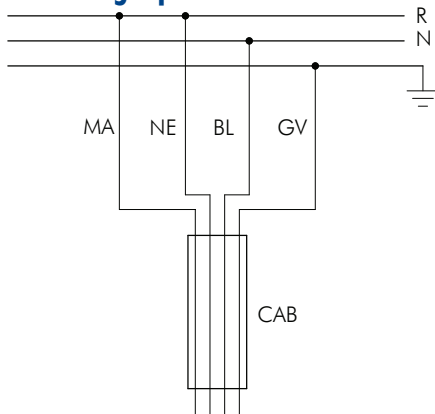
1. ELECTRICAL DIAGRAM ELECTRICAL MAINS CONNECTION

single phase 120-230-240V

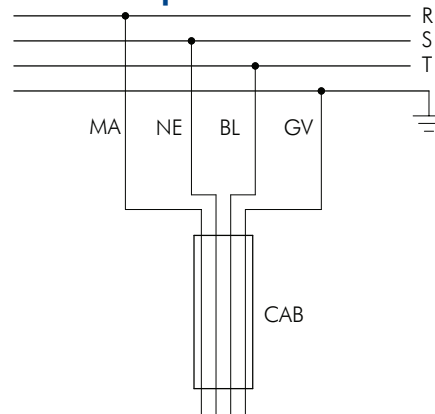


3-conductor cable

single phase 230-240V

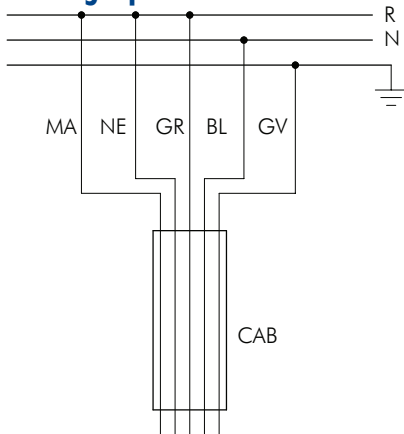


three phase 230-240V

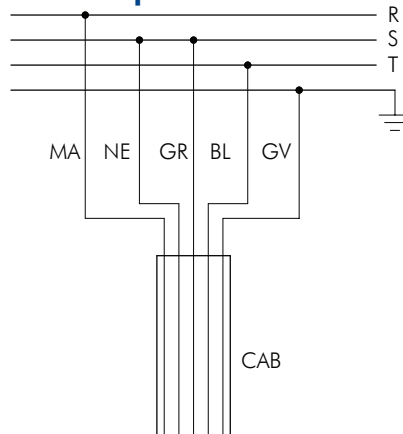


4-conductor cable

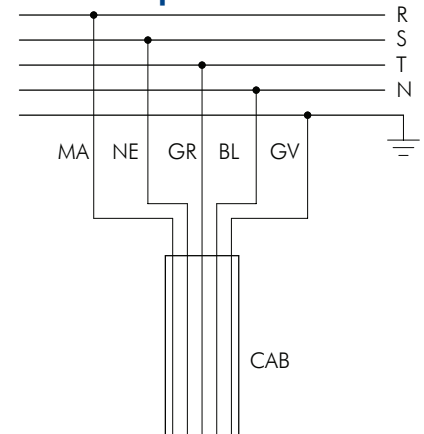
single phase 230-240V



three phase 230-240V



three phase 400V

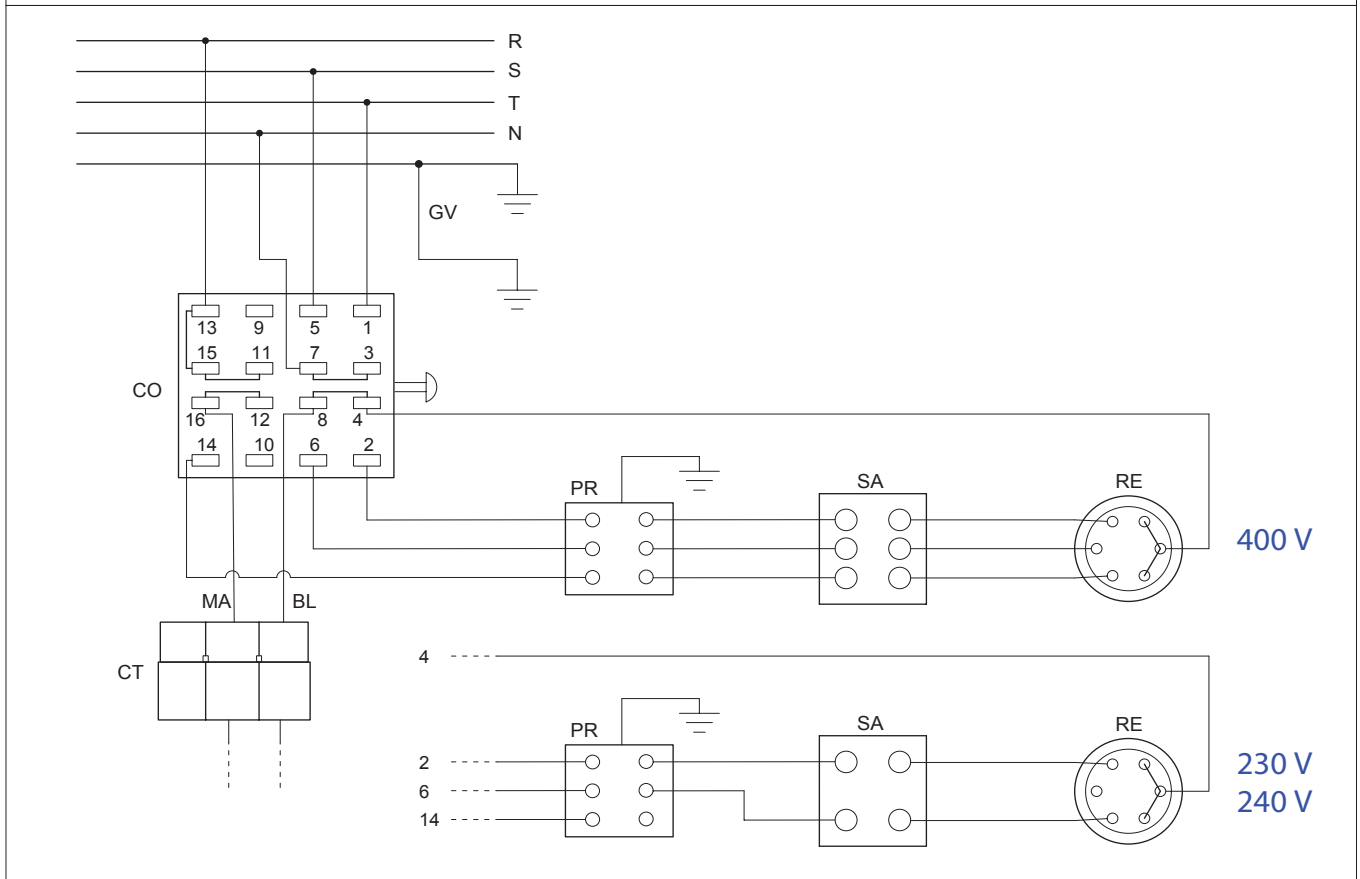
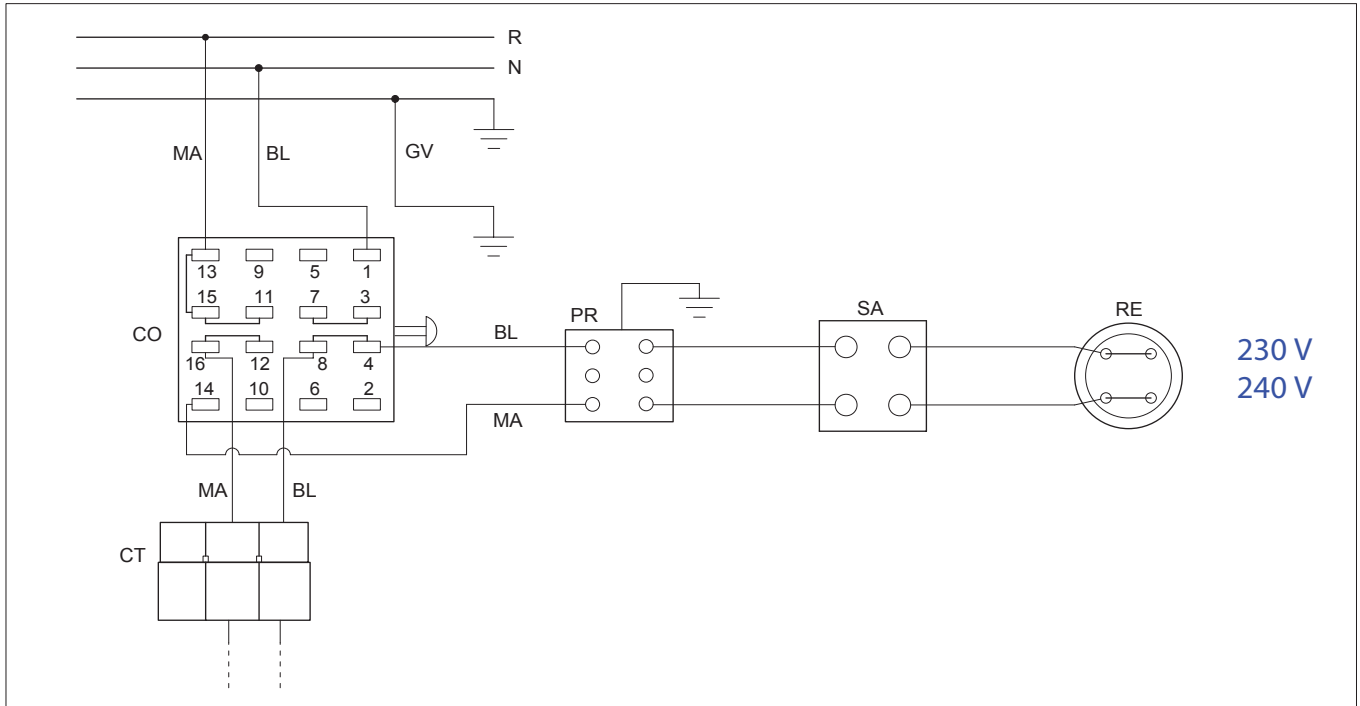


5-conductor cable (Three phase+Neutral+Earth)

R	Phase
S	Phase
T	Phase
N	Neutral

BL	Blue
C	Machine cable
GV	Yellow-green
GR	Grey
MA	Brown
NE	Black

2. ELECTRICAL DIAGRAM MACHINE POWER SUPPLY

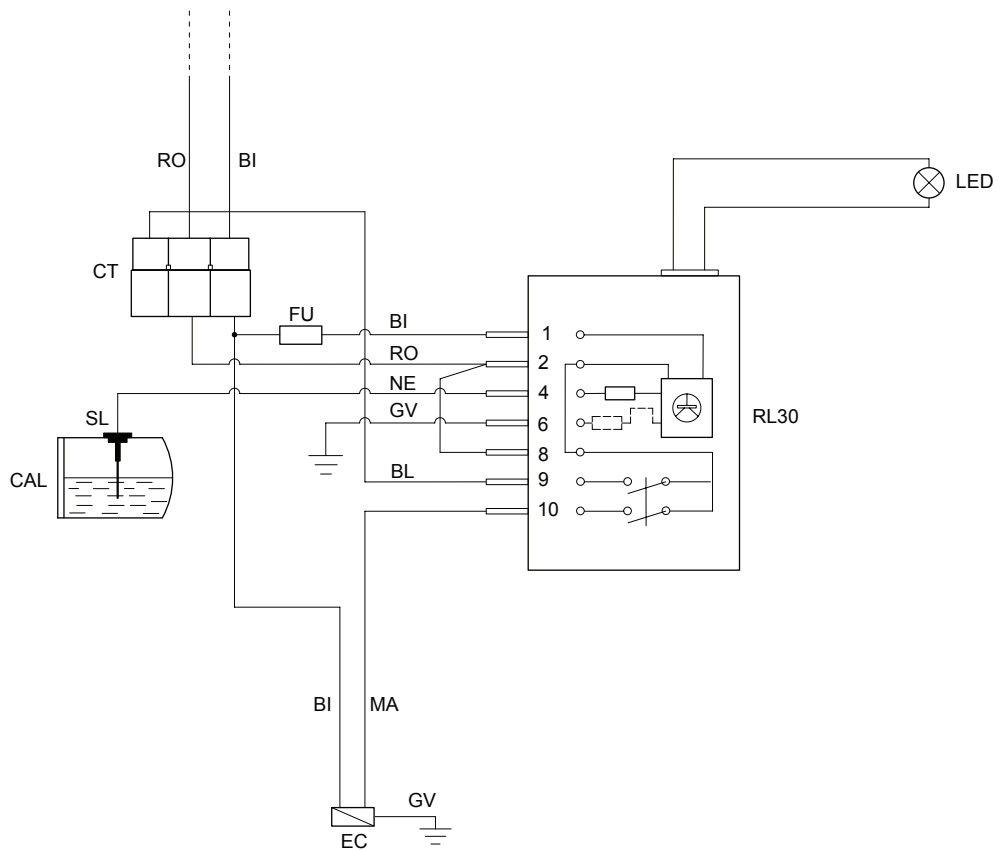


CT	Power supply connector
CO	Commutator
PR	Pressure switch
SA	Heating element protection
RE	Heating element

R	Phase
S	Phase
T	Phase
N	Neutral

BL	Blue
GV	Yellow-green
MA	Brown

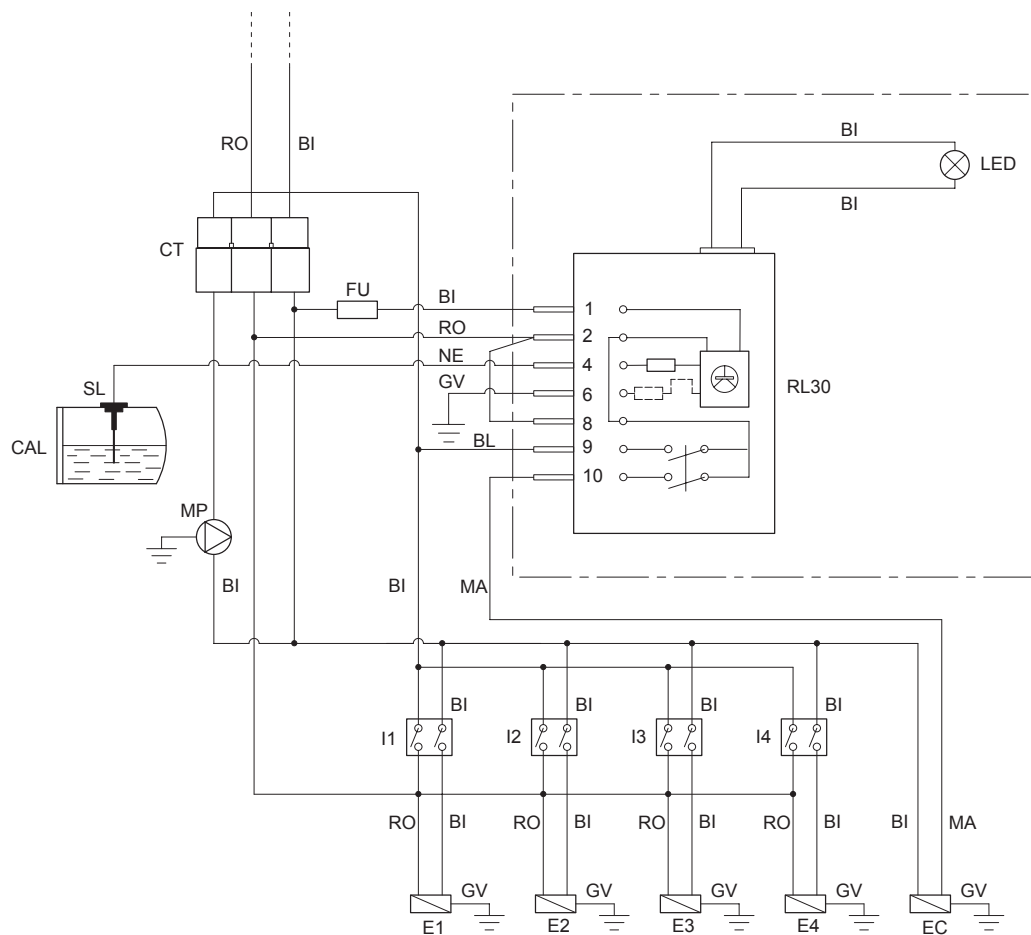
3. ELECTRICAL DIAGRAM COD. 18080001 - REG.LIV.RL30/T.O.220/240V 917500.00



CAL	Boiler
CT	Power supply connector
EC	Solenoid boiler filling
FU	Fuse
LED	Led time-out
RL30	Electronic control unit
SL	Level probe

BI	White
BL	Blue
GV	Yellow-green
RO	Red
MA	Brown
NE	Black

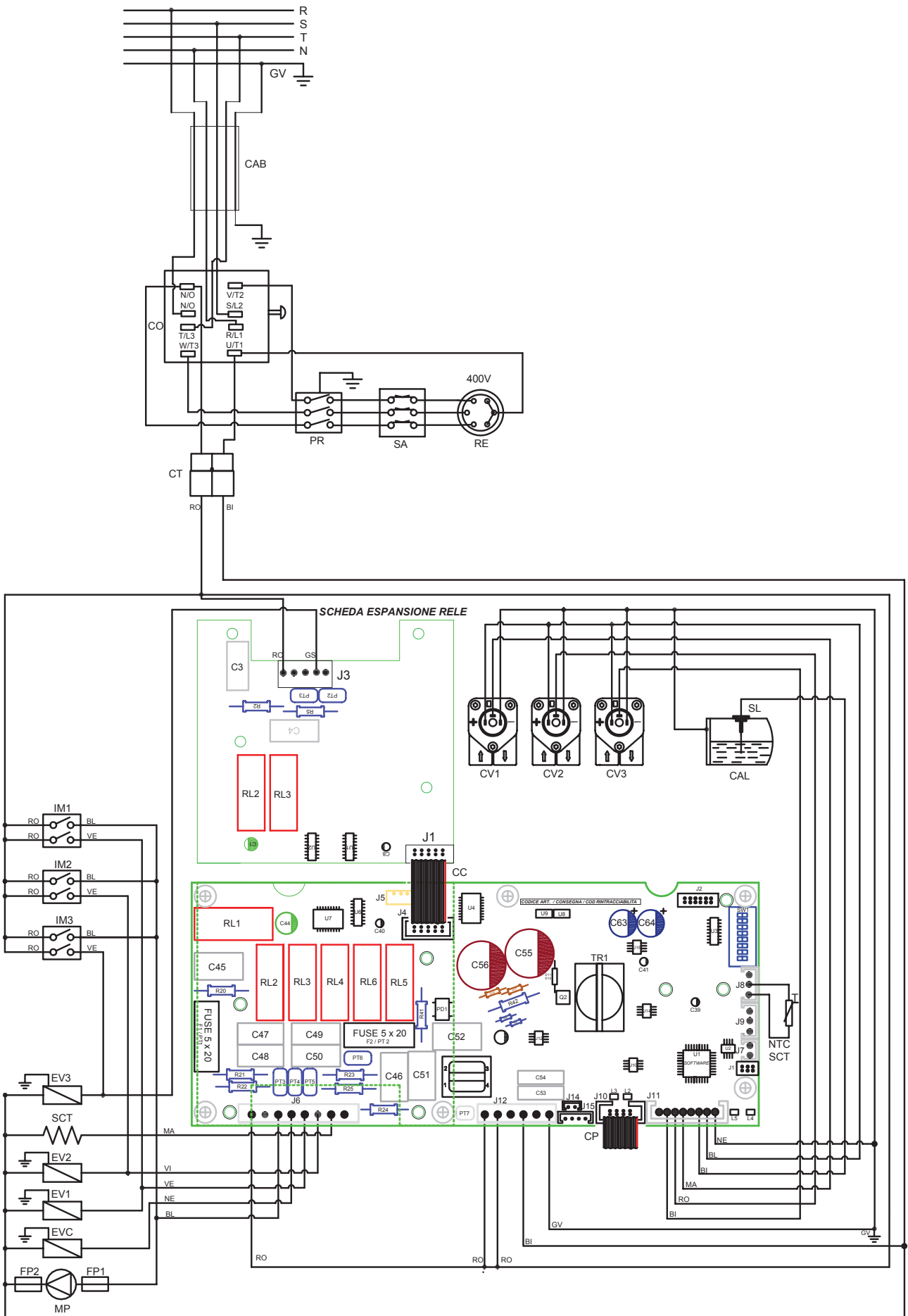
4. ELECTRICAL DIAGRAM AEP VERSION



CAL	Boiler
CT	Power supply connector
EC	Solenoid boiler filling
E...	Solenoid valve group
FU	Fuse
I...	Delivery switch
MP	Motopompa
RL30	Electronic control unit
SL	Level probe

BI	White
BL	Blue
GV	Yellow-green
RO	Red
MA	Brown
NE	Black

5. ELECTRICAL DIAGRAM COD. 18088000 - 18088001



The table below shows the reference and the wiring diagram that is available to the previous page:

- 18088000 - CENTR. BASE 1-2GR 230V INTEA x TC;
- 18088001 - CENTR. BASE 3-4GR 230V INTEA x TC.

CAB	Machine cable
CAL	Boiler
CC	Connection Cable
CO	Commutator
CP	Push button cable
CT	Power supply connector
CV1	GR1 Volumetric counter
CV2	GR2 Volumetric counter
CV3	GR3 Volumetric counter
EV1	GR1 Solenoid valve
EV2	GR2 Solenoid valve
EV3	GR3 Solenoid valve
EVC	Boiler fillind solenoid valve
IM1	GR1 delivery switch
IM2	GR2 delivery switch
IM3	GR3 delivery switch
MP	Motor pump
NTC SCT	NTC cup heater
PR	Pressure switch
RE	Heating element
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
SA	Heating element protection
SL	Level probe
SCT	Cup heater
TR1	Transformer

BI	White
BL	Blue
GV	Yellow - green
GS	Dark yellow
MA	Brown
NE	Black
RO	Red
VE	Green
VI	Purple

F1	Motor pump fuse (500mA)
F2	Inlets fuse (6,3A)
(*) FP1	Motor pump fuse UL (OPD)
(*) FP2	Fuse UL (OPD) for 230V

(*) Fuses for UL version in which a plug is installed with a capacity greater than 30A

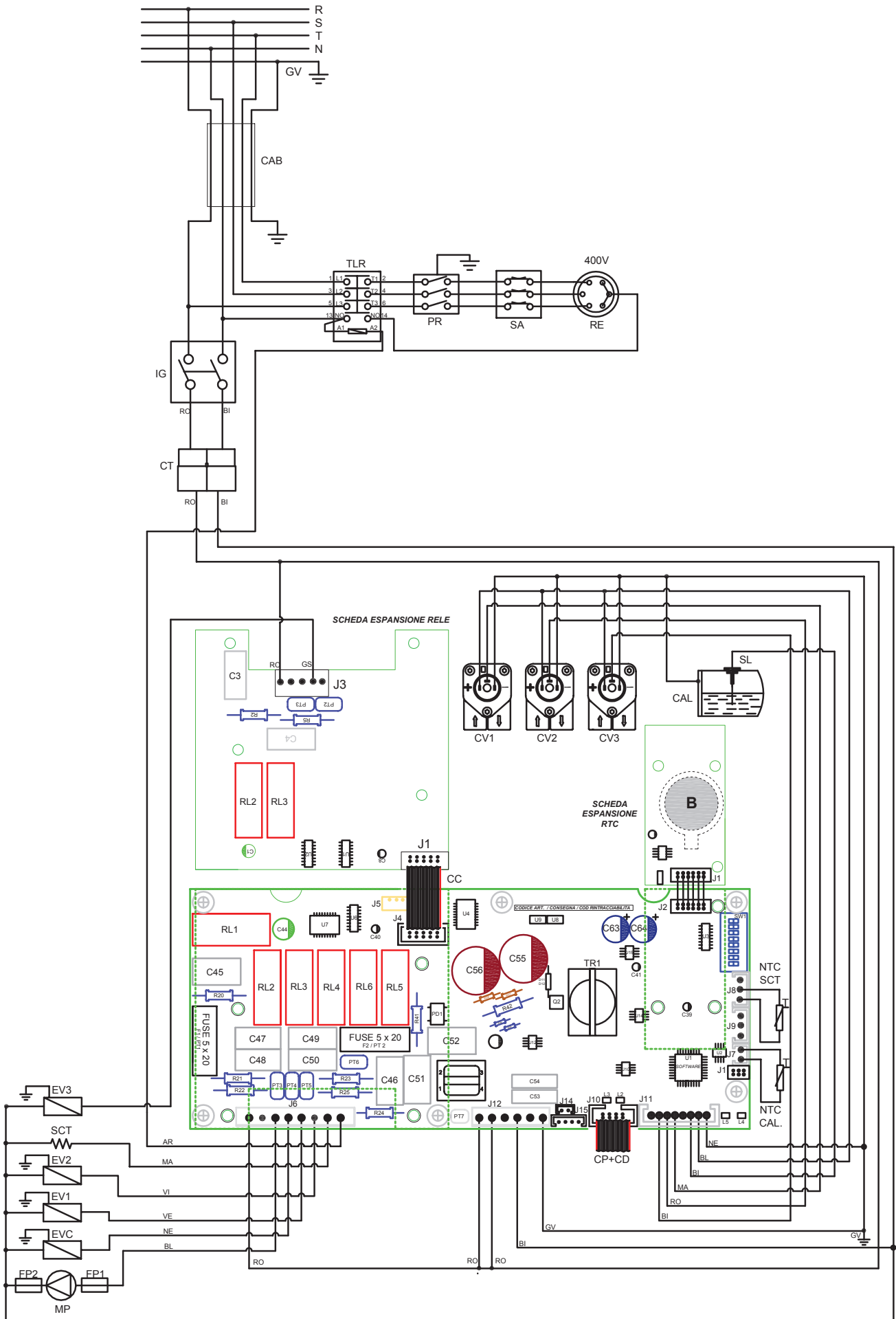
EXPANSION BOARD RELAY	
RL1	Relay unmanaged
RL2	Relay solenoid GR3
RL3	Relay solenoid GR4
RL4	Relay unmanaged
RL5	Relay unmanaged
RL6	Relay unmanaged

CONNECTOR	DESCRIPTION	NOTE
Connector J1	Programming connector	
Connector J2	Expansion RTC	Not used
Connector J4	Expansion relay	GR 1 and 2 (not used), 3GR (Used)
Connector J5	Serial Connection	
Connector J6	Service outputs	
Connector J7	NTC boiler	Not used
Connector J8	NTC warmer	Used
Connector J9	NTC car steamer	Unmanaged
Connector J10	Keyboards	
Connector J11	Low Voltage	
Connector J12	Supply	
Connector J14	Water button	Not used
Connector J15	Steam button	Unmanaged

EXPANSION BOARD RELAY		
Connector J1	Unit connection	Used
Connector J3	Group outputs GR3 and GR4	

SW	FUNCTION	Switch ON	Switch OFF	Default location
SW1	Serial Transmission	Enabled	Not enabled	OFF
SW2	Boiler load	With pump	Without pump	ON
SW3	Hot water supply	With pump	Without pump	OFF
SW4	Prebrewing	Enabled	Not enabled	OFF
SW5	Semi-automatic key keyboards	Enabled	Disabled	OFF
SW6	Cup Warmer	Enabled	Disabled	ON
SW7	Alarm 400 V	Enabled	Disabled	ON
SW8	Unmanaged			OFF

6. ELECTRICAL DIAGRAM COD. 18088002 - 18088003



The table below shows the reference and the wiring diagram that is available to the previous page:

- 18088002 - CENTR. VERS. DISPLAY 1-2GR 230V INTEA x TC;
- 18088003 - CENTR. VERS. DISPLAY 3-4GR 230V INTEA x TC.

CAB	Machine cable
CAL	Boiler
CC	Connection Cable
CD	Display Cable
CO	Commutator
CP	Push button cable
CT	Power supply connector
CV1	GR1 Volumetric counter
CV2	GR2 Volumetric counter
CV3	GR3 Volumetric counter
EV1	GR1 Solenoid valve
EV2	GR2 Solenoid valve
EV3	GR3 Solenoid valve
EVC	Boiler fillind solenoid valve
IG	Power switch
MP	Motor pump
NTC CAL	NTC boiler
NTC SCT	NTC cup heater
PR	Pressure switch
RE	Heating element
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
SA	Heating element protection
SL	Level probe
SCT	Cup heater
TLR A / TRL B	Contactora
TR1	Transformer

AR	Orange
BI	White
BL	Blue
GV	Yellow - green
GS	Dark yellow
MA	Brown
NE	Black
RO	Red
VE	Green
VI	Purple

F1	Motor pump fuse (500mA)
F2	Inlets fuse (6,3A)
(*) FP1	Motor pump fuse UL (OPD)
(*) FP2	Fuse UL (OPD) for 230V

- (*) Fuses for UL version in which a plug is installed with a capacity greater than 30A

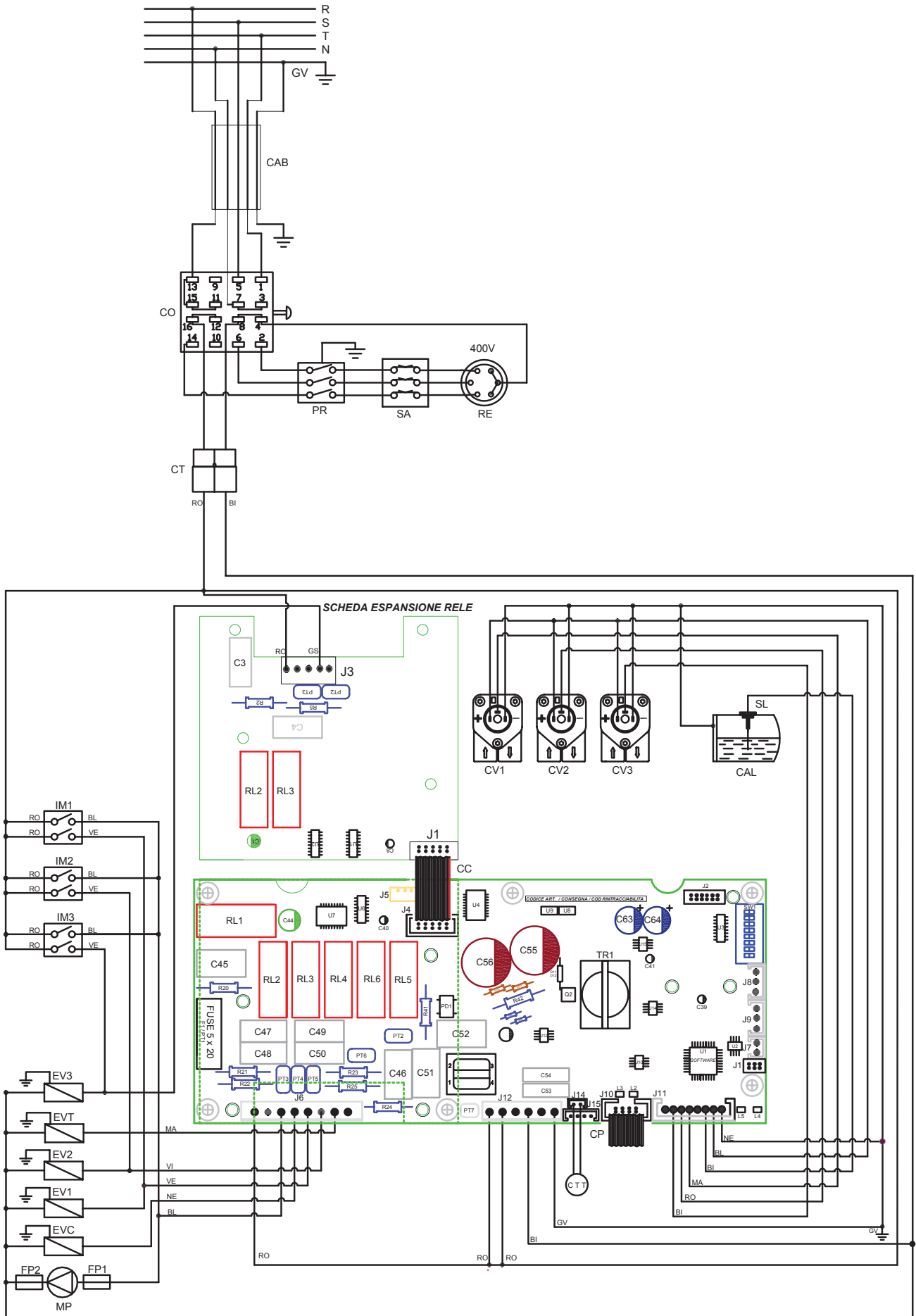
EXPANSION BOARD RELAY	
RL1	Relay unmanaged
RL2	Relay solenoid GR3
RL3	Relay solenoid GR4
RL4	Relay unmanaged
RL5	Relay unmanaged
RL6	Relay unmanaged

CONNECTOR	DESCRIPTION	NOTE
Connector J1	Programming connector	
Connector J2	Expansion RTC	Not used
Connector J4	Expansion relay	GR 1 and 2 (not used),
Connector J5	Serial Connection	
Connector J6	Service outputs	
Connector J7	NTC boiler	Not used
Connector J8	NTC warmer	Used
Connector J9	NTC car steamer	Unmanaged
Connector J10	Keyboards	
Connector J11	Low Voltage	
Connector J12	Supply	
Connector J14	Water button	Not used
Connector J15	Steam button	Unmanaged

EXPANSION BOARD RELAY		
Connector J1	Unit connection	Used
B	Battery	Used

SW	FUNCTION	Switch ON	Switch OFF	Default location
SW1	Serial Transmission	Enabled	Not enabled	OFF
SW2	Boiler load	With pump	Without pump	ON
SW3	Hot water supply	With pump	Without pump	OFF
SW4	Prebrewing	Enabled	Not enabled	OFF
SW5	Semi-automatic key keyboards	Enabled	Disabled	OFF
SW6	Cup Warmer	Enabled	Disabled	ON
SW7	Alarm 400 V	Enabled	Disabled	ON
SW8	Unmanaged			OFF

7. ELECTRICAL DIAGRAM COD. 18088004 - 18088005



The table below shows the reference and the wiring diagram that is available to the previous page:

- 18088004 - CENTR.BASE+THE 1-2GR 230V INTEA x TC;
- 18088005 - CENTR.BASE+THE 3-4GR 230V INTEA x TC.

CAB	Machine cable
CAL	Boiler
CC	Connection Cable
CO	Commutator
CP	Push button cable
CT	Power supply connector
CV1	GR1 Volumetric counter
CV2	GR2 Volumetric counter
CV3	GR3 Volumetric counter
EV1	GR1 Solenoid valve
EV2	GR2 Solenoid valve
EV3	GR3 Solenoid valve
EVC	Boiler fillind solenoid valve
EVT	Tea solenoid valve
IM1	GR1 delivery switch
IM3	GR3 delivery switch
MP	Motor pump
PR	Pressure switch
RE	Heating element
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
SA	Heating element protection
SL	Level probe
CTT	Tea connection key
TR1	Transformer

BI	White
BL	Blue
GV	Yellow - green
GS	Dark yellow
MA	Brown
NE	Black
RO	Red
VE	Green
VI	Purple

F1	Motor pump fuse (500mA)
(*) FP1	Motor pump fuse UL (OPD)
(*) FP2	Fuse UL (OPD) for 230V

(*) Fuses for UL version in which a plug is installed with a capacity greater than 30A

EXPANSION BOARD RELAY	
RL1	Relay unmanaged
RL2	Relay solenoid GR3
RL3	Relay solenoid GR4
RL4	Relay unmanaged
RL5	Relay unmanaged
RL6	Relay unmanaged

CONNECTOR	DESCRIPTION	NOTE
Connector J1	Programming connector	
Connector J2	Expansion RTC	Not used
Connector J4	Expansion relay	GR 1 and 2 (not used), 3GR (Used)
Connector J5	Serial Connection	
Connector J6	Service outputs	
Connector J7	NTC boiler	Not used
Connector J8	NTC warmer	Used
Connector J9	NTC car steamer	Unmanaged
Connector J10	Keyboards	
Connector J11	Low Voltage	
Connector J12	Supply	
Connector J14	Water button	Not used
Connector J15	Steam button	Unmanaged

EXPANSION BOARD RELAY		
Connector J1	Unit connection	Used
Connector J3	Group outputs GR3 and GR4	

SW	FUNCTION	Switch ON	Switch OFF	Default location
SW1	Serial Transmission	Enabled	Not enabled	OFF
SW2	Boiler load	With pump	Without pump	ON
SW3	Hot water supply	With pump	Without pump	OFF
SW4	Prebrewing	Enabled	Not enabled	OFF
SW5	Semi-automatic key keyboards	Enabled	Disabled	OFF
SW6	Cup Warmer	Enabled	Disabled	ON
SW7	Alarm 400 V	Enabled	Disabled	ON
SW8	Unmanaged			OFF

The table below shows the reference and the wiring diagram that is available to the previous page:

- 18088006 - CENTR.VERS. DISPLAY+THE 1-2GR 230V INTEA x TC;
- 18088007 - CENTR.VERS. DISPLAY+THE 3-4GR 230V INTEA x TC.

CAB	Machine cable
CAL	Boiler
CC	Connection Cable
CD	Display cable
CP	Push button cable
CT	Power supply connector
CV1	GR1 Volumetric counter
CV2	GR2 Volumetric counter
CV3	GR3 Volumetric counter
EV1	GR1 Solenoid valve
EV2	GR2 Solenoid valve
EV3	GR3 Solenoid valve
EVC	Boiler fillind solenoid valvole
EVT	Tea solenoid valve
IG	Power switch
MP	Motor pump
NTC CAL	NTC boiler
PR	Pressure switch
RE	Heating element
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
SA	Heating element protection
SL	Level probe
CTT	Tea connection key
TLR A / TRL B	Contactora
TR1	Transformer

AR	Purple
BI	White
BL	Blue
GV	Yellow - green
GS	Dark yellow
MA	Brown
NE	Black
RO	Red
VE	Green
VI	Purple

F1	Motor pump fuse (500mA)
(*) FP1	Motor pump fuse UL (OPD)
(*) FP2	Fuse UL (OPD) for 230V

(*) Fuses for UL version in which a plug is installed with a capacity greater than 30A

EXPANSION BOARD RELAY	
RL1	Relay unmanaged
RL2	Relay solenoid GR3
RL3	Relay solenoid GR4
RL4	Relay unmanaged
RL5	Relay unmanaged
RL6	Relay unmanaged

CONNECTOR	DESCRIPTION	NOTE
Connector J1	Programming connector	
Connector J2	Expansion RTC	Not used
Connector J4	Expansion relay	GR 1 and 2 (not used), 3GR (Used)
Connector J5	Serial Connection	
Connector J6	Service outputs	
Connector J7	NTC boiler	Not used
Connector J8	NTC warmer	Used
Connector J9	NTC car steamer	Unmanaged
Connector J10	Keyboards	
Connector J11	Low Voltage	
Connector J12	Supply	
Connector J14	Water button	Not used
Connector J15	Steam button	Unmanaged

EXPANSION BOARD RELAY		
Connector J1	Unit connection	Used
B	Battery	Used

SW	FUNCTION	Switch ON	Switch OFF	Default location
SW1	Serial Transmission	Enabled	Not enabled	OFF
SW2	Boiler load	With pump	Without pump	ON
SW3	Hot water supply	With pump	Without pump	OFF
SW4	Prebrewing	Enabled	Not enabled	OFF
SW5	Semi-automatic key keyboards	Enabled	Disabled	OFF
SW6	Cup Warmer	Enabled	Disabled	ON
SW7	Alarm 400 V	Enabled	Disabled	ON
SW8	Unmanaged			OFF

