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# ESPRESSO COFFEE MACHINE

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## USE AND MAINTENANCE MANUAL instructions for the technician

# ENGLISH

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## 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.*

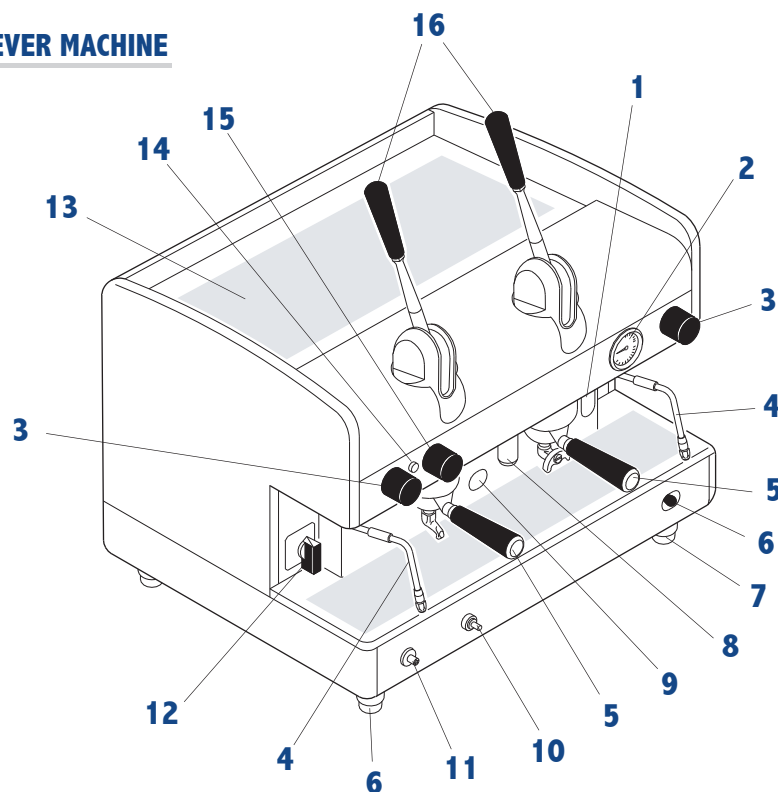
*On this form must be confirmed the hygiene and safety requirements in force on the installation site and must be reported any notes relating to changes or interventions necessary for the proper functioning of the equipment.*

*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

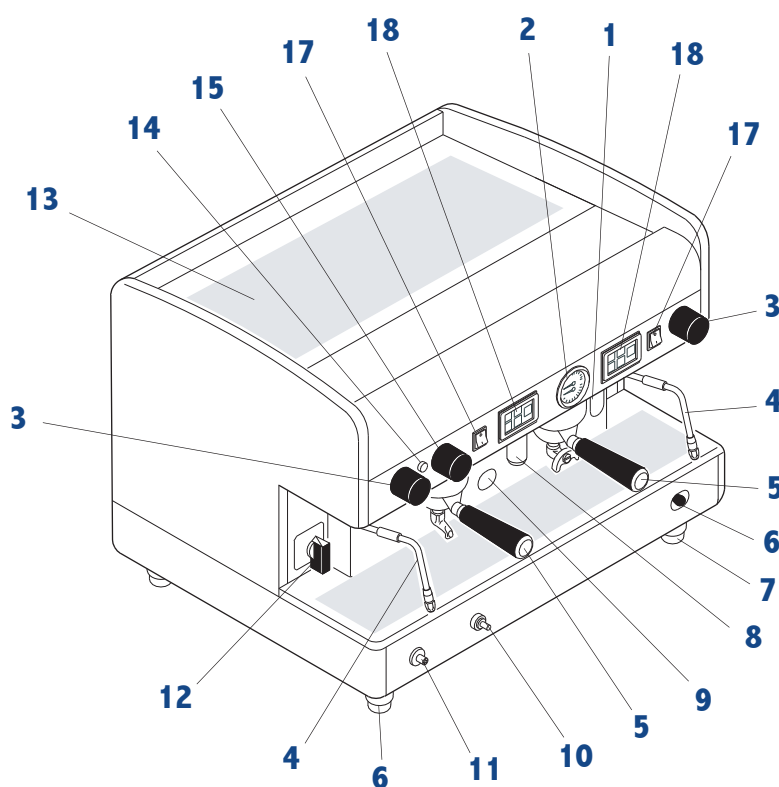
### LEVER MACHINE

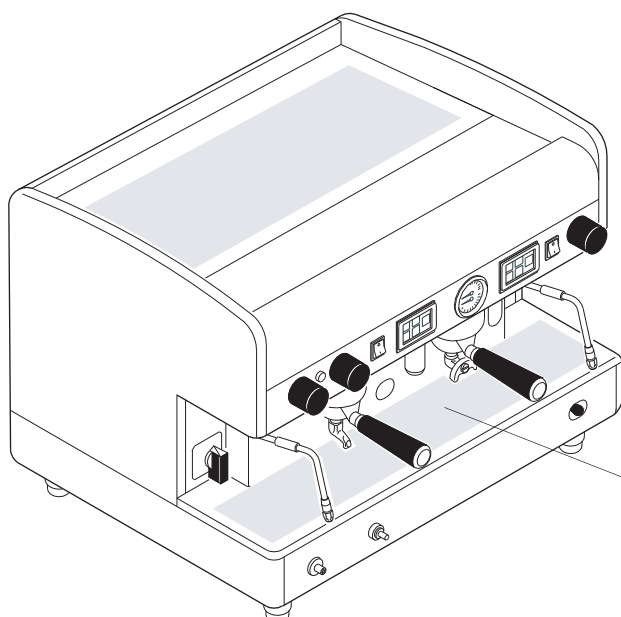


- 1** Boiler level-check window (\*)
- 2** Pressure gauge
- 3** Steam pressure gauge
- 4** Steam nozzle
- 5** 2-cup filter holder
- 6** Manual water load
- 7** Adjustable foot
- 8** Hot water nozzle
- 9** Gas burner viewing window (if included)
- 10** Gas safety (if included)
- 11** Gas ignition push button (if included)
- 12** Machine main switch
- 13** Cup support grille
- 14** Machine on indicator light
- 15** Hot water knob
- 16** Lever groups
- 17** Manual delivery switches
- 18** Push button panels (for version SAE-SME)

(\*) In some versions the optical level is replaced by a green light.

### DISTRIBUTION MACHINE



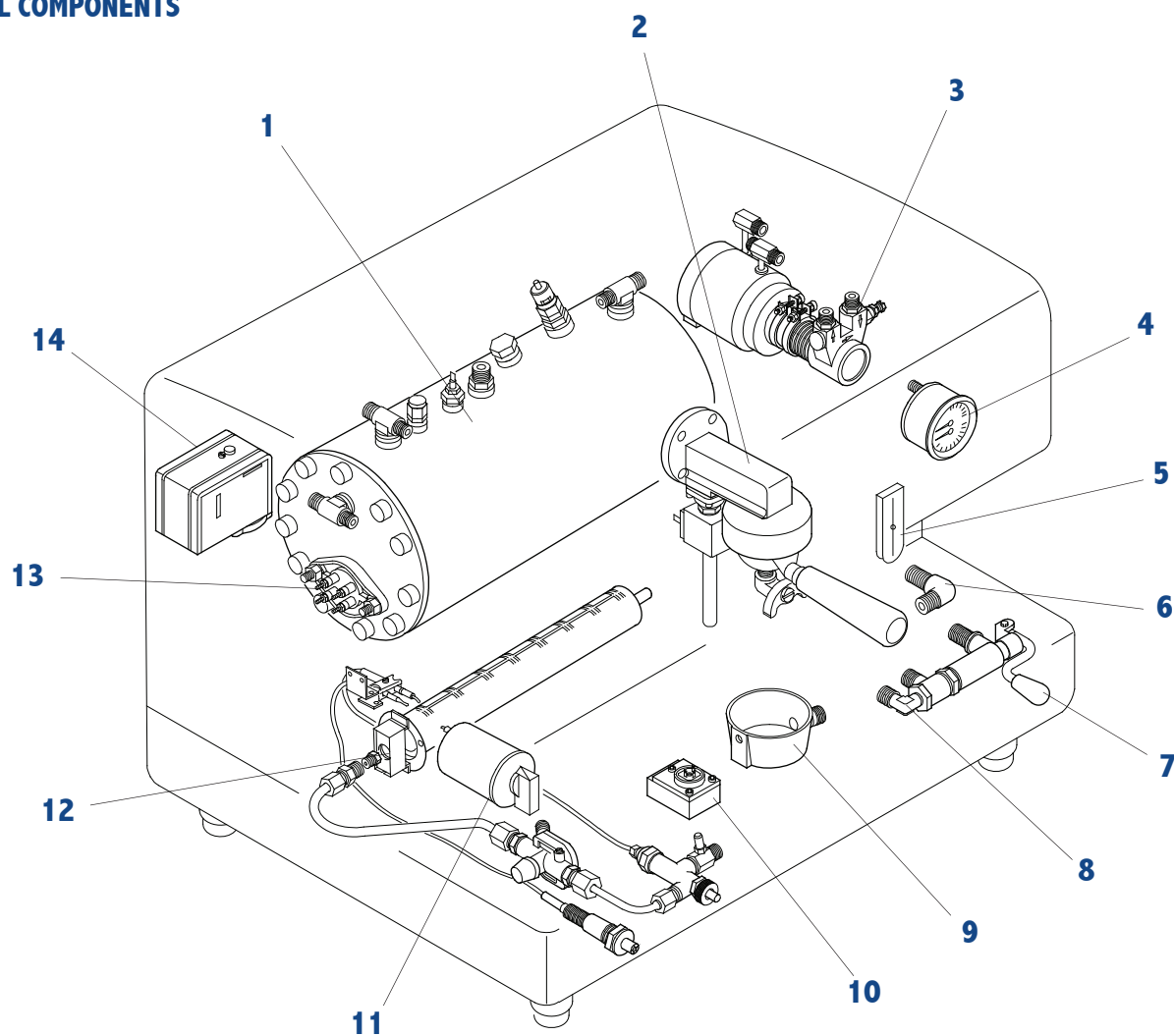


The nameplate of the machine is fixed on the base of the frame under the drain pan.  
The data of the appliance can be seen also on the label located on the package of the machine.

## TECHNICAL CHARACTERISTICS

VERSION	JUNIOR	1 GROUP	COMPACT	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



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

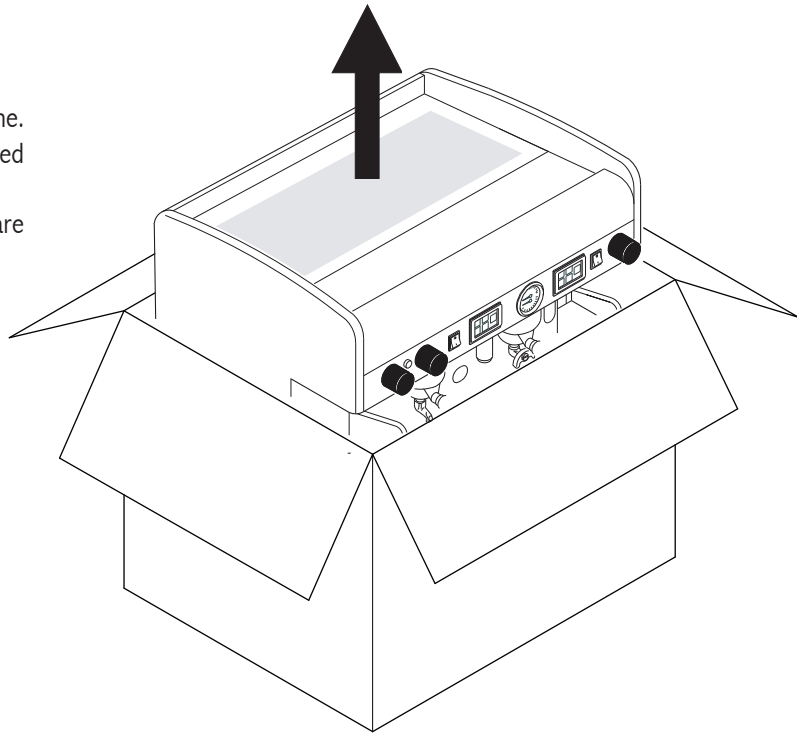


## 2. PREPARATION OF THE MACHINE

### 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

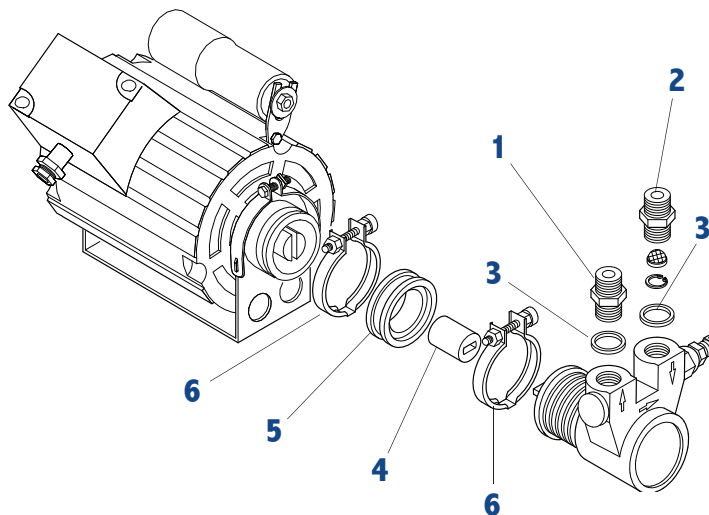
For the machines with an external motor, it is necessary to prepare the pump and the motor.

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.

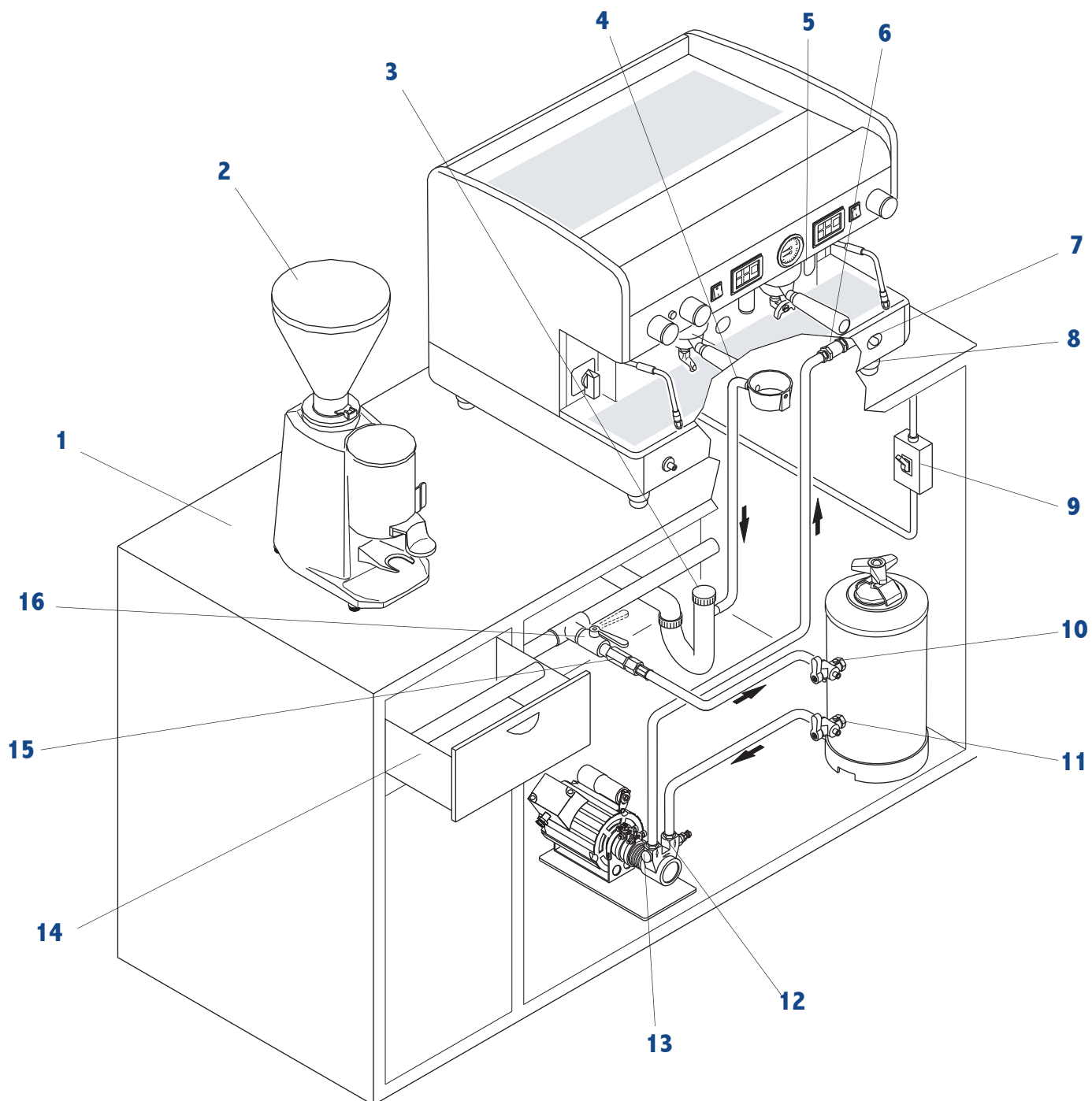
Use the special washers **(3)** provided for the seal.

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 **(16)**, to the electrical mains **(9)** 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 **(2)** must be placed in the immediate vicinity of the appliance in order to allow for comfortable use of the machine.

Place the pump **(13)** in a protected area and away from accidental contact with the operator.

It is advisable to equip the working base of the machine with a drawer **(14)** 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.(8)*

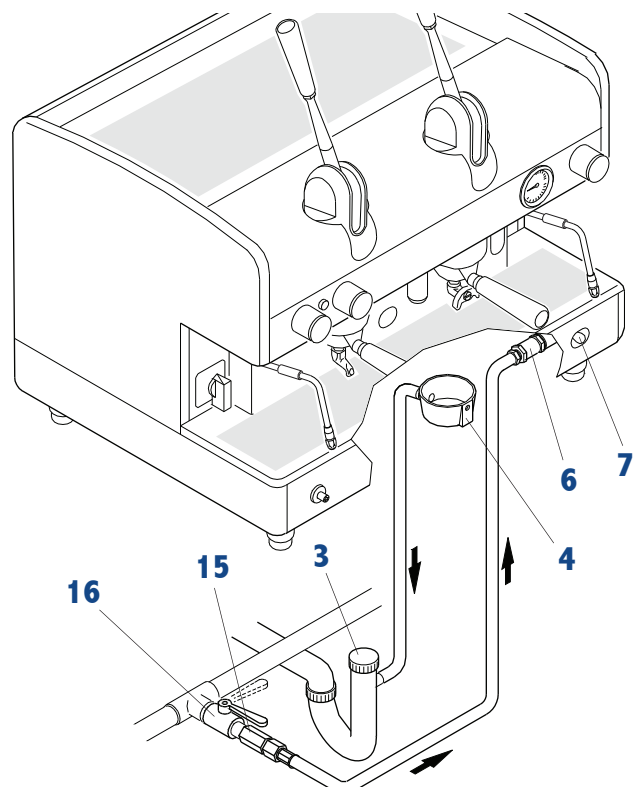
#### ATTENTION

*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-SMSA AEAP-SMAT SAE-SME MACHINES

- 1) Remove any rubber plugs which may be inserted in the tap fixtures of the softener;
- 2) Connect the water mains **(16)** to the softener inlet **(10)** 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 softener outlet **(11)** to the external motor pump inlet **(12)**;
- 5) connect the outlet of the motor pump **(13)** to the inlet of the machine **(6)**;
- 6) connect the drain pad of the machine **(4)** to the sewer drain **(3)** 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.

#### LEVER MACHINE



### 3.3 HYDRAULIC CONNECTION OF AL-SMMA MACHINES

- 1) connect the water mains **(16)** to the inlet of the machine **(6)**;
- 2) connect the drain pad of the machine **(4)** to the sewer discharge **(3)** using the special tube 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.*

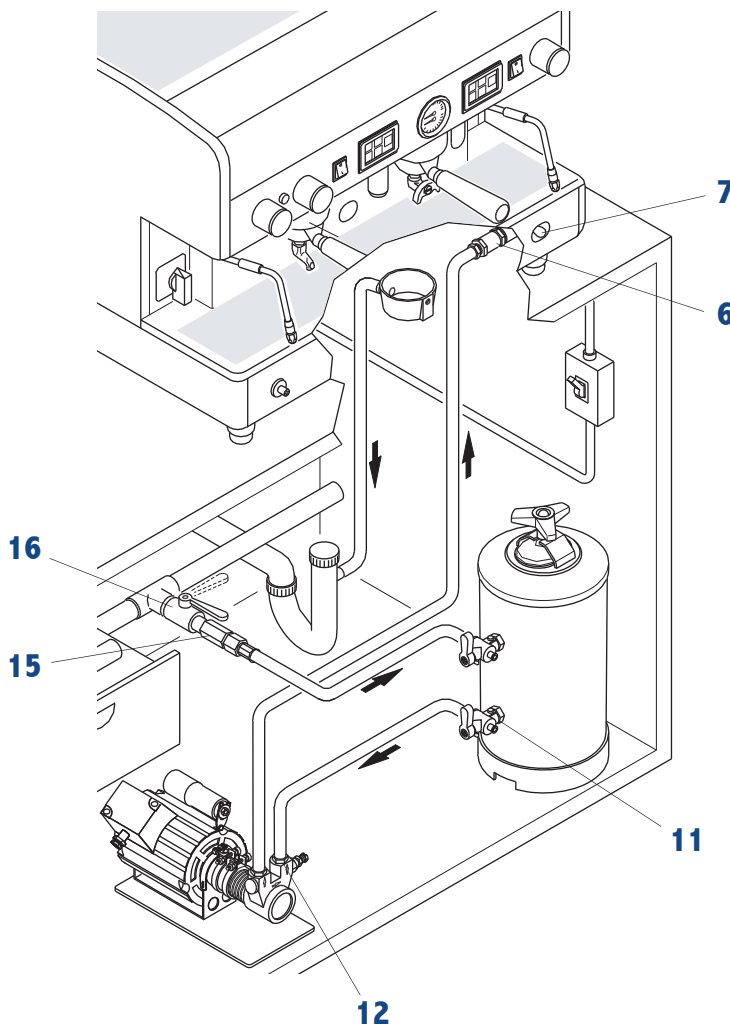
## ATTENTION

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

- 1) The water supply must provide cold water for human consumption (potable water) at a pressure between 1,5 and 5 bars. If the pressure is higher than 5 bar, connect a pressure reducer before the pump.
- 2) insert a tap **(16)** 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 **(16)** directly to the inlet of the external motor pump **(12)**;
- 6) if there is an internal motor pump, connect the outlet of the softener **(11)** (if there is one) or the water mains **(16)** directly to the machine inlet **(6)**;
- 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

The hydraulic connection must be made in compliance with local national standards.

On lever machines, the hydraulic connection should be made only to the water supply with a minimum pressure of 1.5 bar.

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

For the European Community: for both the hydraulic connection to the water mains as well as the connection to an external tank, a non-return valve **(15)** must be placed up the line from the machine as set forth by standards EN 1717.

## FOR THE U.S.A.

The water connections and discharges must be made in accordance with the 2003 International Plumbing Code of the International Code Council (ICC), or with the 2003 Uniformed Hydraulic Code of the IAPMO.

The machine must be installed together with an adequate non-return valve, as required by national regulations.

## 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 **(7)**.

### 3.4 WIRING

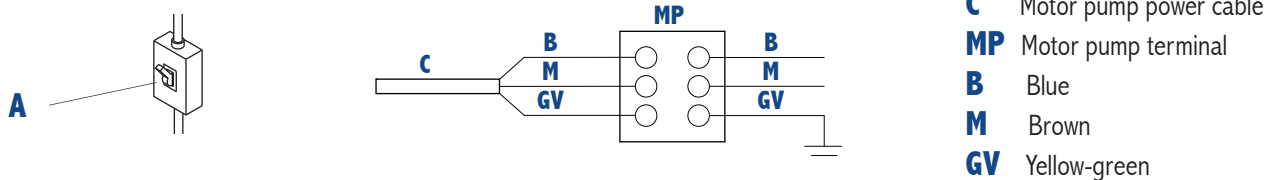
It is necessary to link a safety main switch **(A)** on the electric panel, as required by standard regulations.

#### 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".



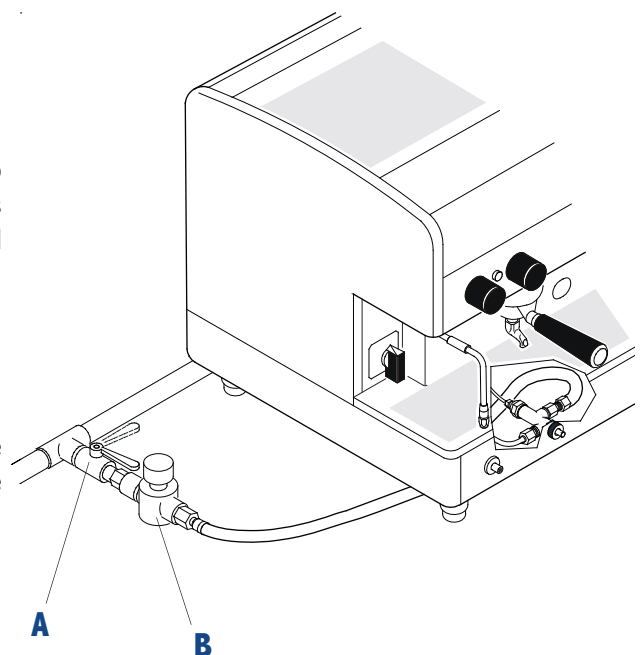
#### ATTENTION

*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.*

### 3.5 GAS CONNECTION (if included)

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

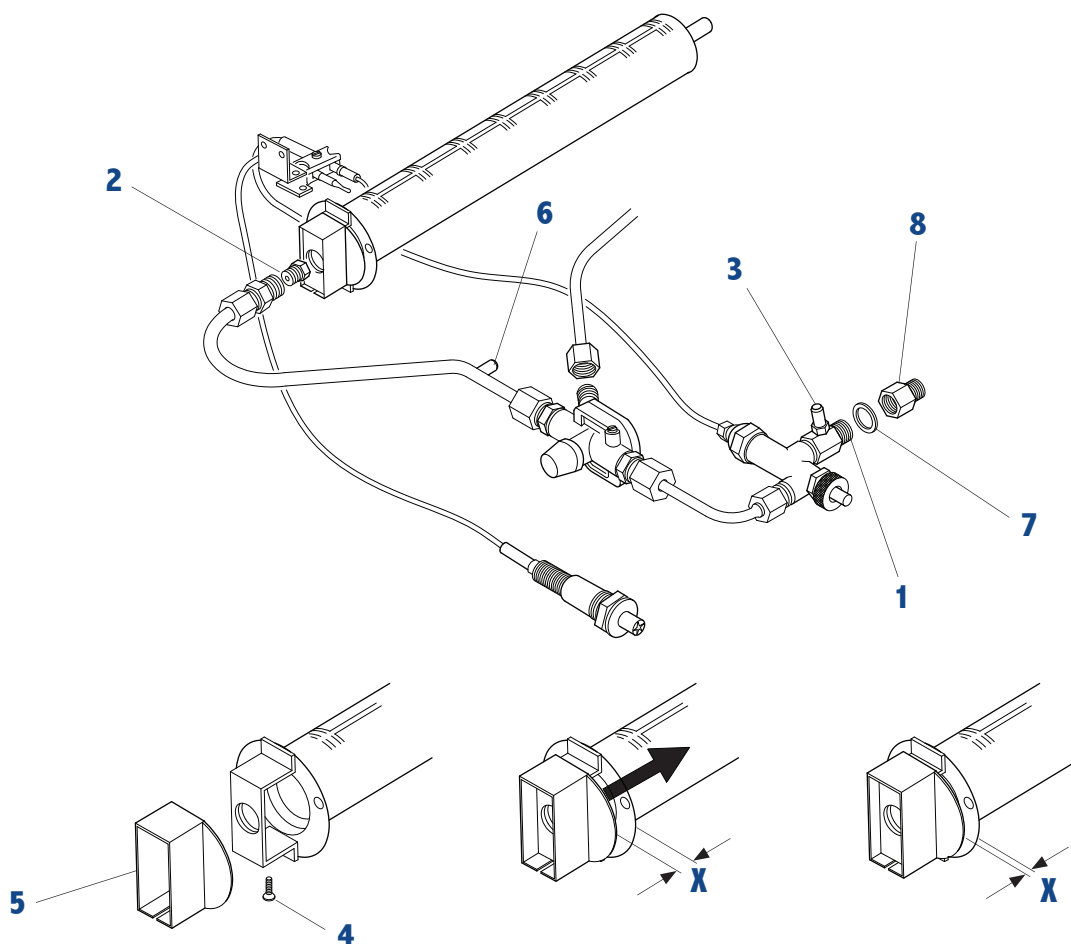
- When operating on gas, the machine emits combustion fumes directly into the surroundings where it is being used; therefore, gas-powered machines must not be installed in rooms with a volume of less than 12 m<sup>3</sup>, as described by the standards in use;
- Upstream from the machine, a cut-off cock 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 .

	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	
Model		mbar	mbar	1/100 mm	mm	kW	kW	m3/h	kg/h
<b>1 Group</b>	G20	20	1,7	<b>100</b>	<b>1</b>	0,47	1,67	0,177	-
	G25	20	1,7	<b>110</b>	<b>1</b>	0,47	1,67	0,177	-
	G25	25	2,4	<b>100</b>	<b>1</b>	0,47	1,55	0,164	-
	G30/G31	28-30/37	3,5	<b>60</b>	<b>3</b>	0,47	1,40	-	0,110
	G30/G31	50	3,5	<b>60</b>	<b>3</b>	0,47	1,80	-	0,142
<b>2 Groups</b>	G20	20	1,9	<b>110</b>	<b>1</b>	0,69	2,03	0,215	-
	G25	20	2,1	<b>135</b>	<b>1</b>	0,69	2,52	0,267	-
	G25	25	2,7	<b>110</b>	<b>1</b>	0,69	1,88	0,199	-
	G30/G31	28-30/37	5,5	<b>75</b>	<b>3</b>	0,69	2,20	-	0,174
	G30/G31	50	6,1	<b>65</b>	<b>3</b>	0,69	2,10	-	0,167
<b>3 Groups</b>	G20	20	2,3	<b>135</b>	<b>1</b>	1,16	3,06	0,323	-
	G25	20	2,3	<b>145</b>	<b>1</b>	1,16	2,91	0,308	-
	G25	25	3,5	<b>135</b>	<b>1</b>	1,16	2,85	0,302	-
	G30/G31	28-30/37	6,1	<b>80</b>	<b>3</b>	1,16	2,51	-	0,199
	G30/G31	50	11,3	<b>75</b>	<b>3</b>	1,16	2,84	-	0,225
<b>4 Groups</b>	G20	20	2,5	<b>145</b>	<b>1</b>	1,30	3,55	0,376	-
	G25	20	2,5	<b>160</b>	<b>1</b>	1,30	3,55	0,376	-
	G25	25	3,8	<b>145</b>	<b>1</b>	1,30	3,30	0,349	-
	G30/G31	28-30/37	6,8	<b>85</b>	<b>3</b>	1,30	2,85	-	0,225
	G30/G31	50	11,3	<b>75</b>	<b>3</b>	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 m<sup>3</sup>, 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

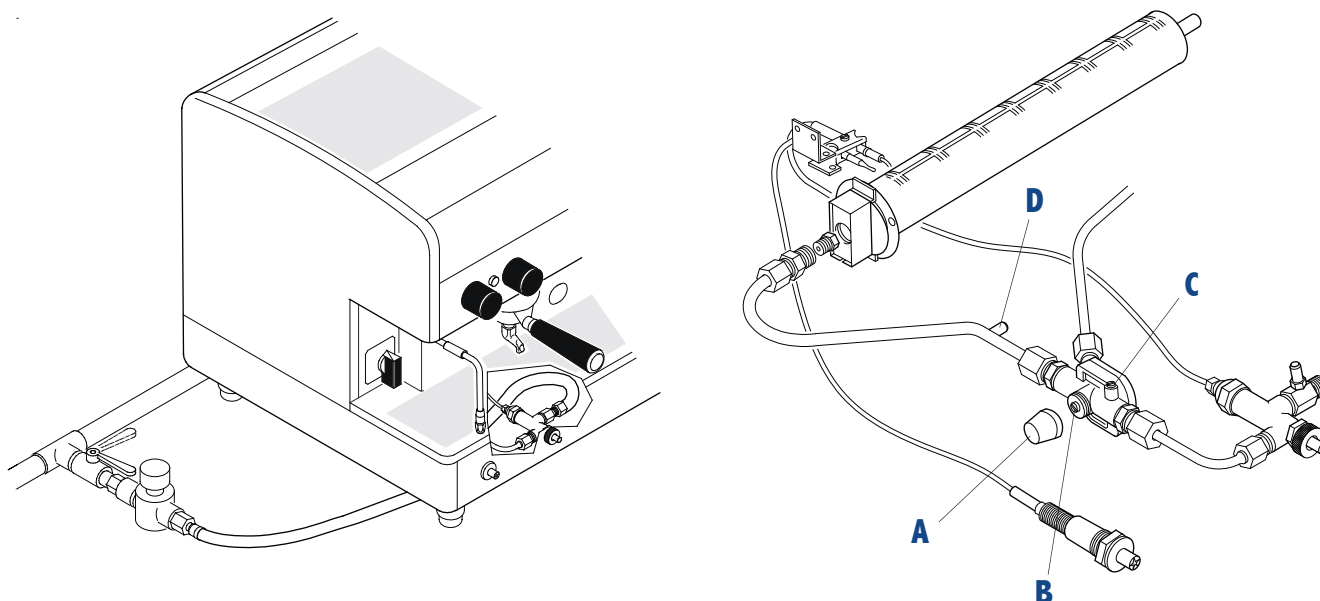




## Gas adjustment

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.

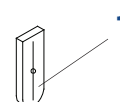
To check the pressure at the inlet of the injector, connect a pressure gauge to the connection **(D)**.

### 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.*

## 3.6 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:



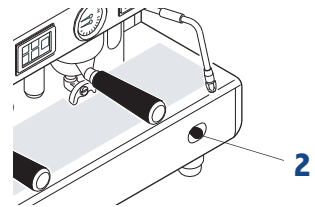


## Switch

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.

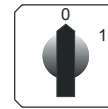


## Power switch

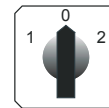
Open the water tap of the water mains and of the softener.

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.



**Switch**



**Power switch**

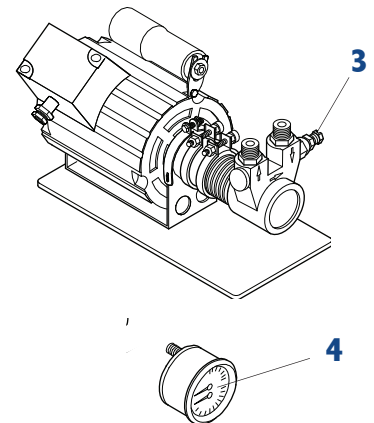
## ATTENTION

- 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

## 3.7 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;



## 3.8 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:

- 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;
- 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;
- 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

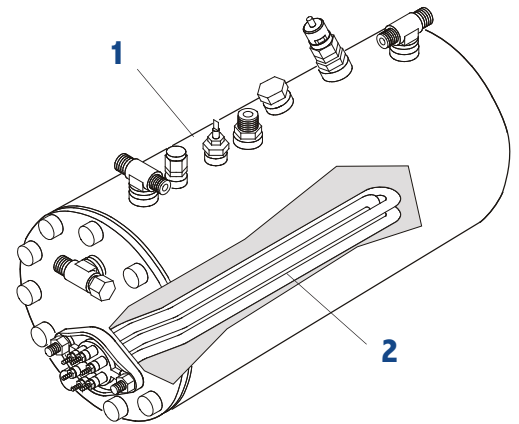
The water is heated in the boiler by means of an electrical heating element immersed in the water **(2)**.

### 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.*

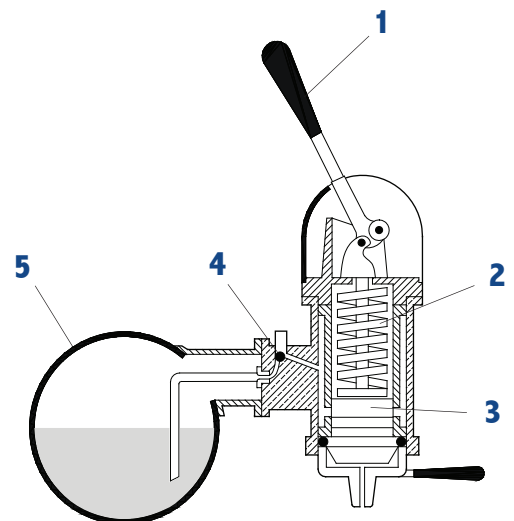
## 5. COFFEE DELIVERY GROUPS

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 LEVER GROUP

The lever group uses the boiler pressure and water. This system does not require heat exchangers.

When the lever **(1)** is lowered, the spring **(2)** inside the group is compressed: the piston **(3)** raises, allowing water to enter the pre-infusion jacket. When the lever is released, the piston compresses the water to 8-10 bar, allowing delivery of espresso coffee. The non-return ball valve **(4)** keeps water from flowing back into the boiler **(5)**.



#### Phase 1

Lowering the lever.



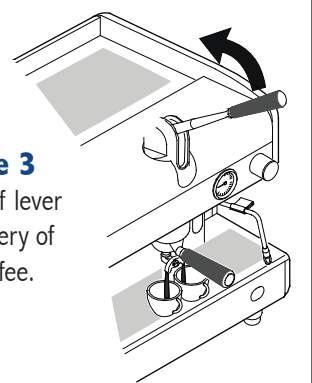
#### Phase 2

Pre-infusion for 3÷5 seconds.



#### Phase 3

Release of lever and delivery of the coffee.

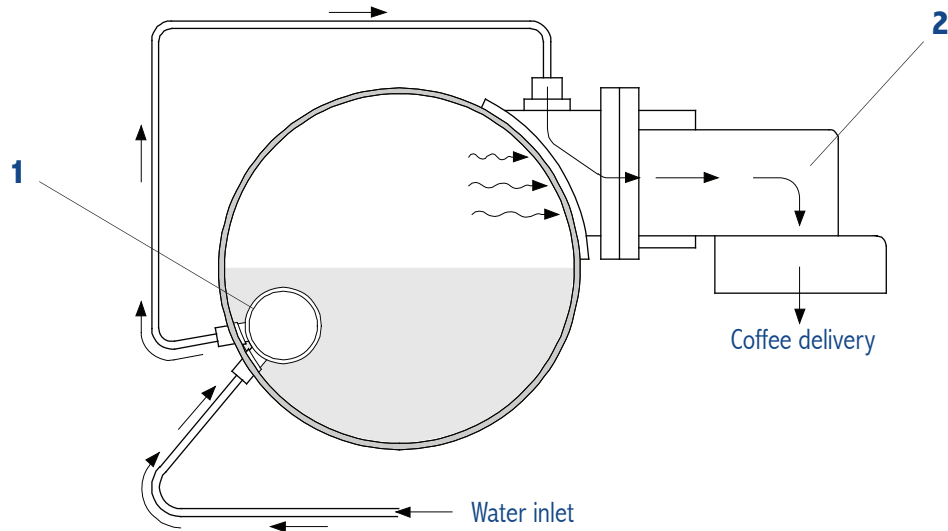


## 5.2 CARTRIDGE EXCHANGER SYSTEM

Heating of the delivery group is provided by direct contact with the boiler. Water used for delivery of coffee is taken from a so-called "cartridge" exchanger which is immersed in the water of the boiler:

- the activation of the solenoid valve and of the pump allows cold water to enter the exchanger **(1)**;
- from the exchanger **(1)** the boiler water is carried to the group **(2)** for delivery;
- the pump allows the increase of the pressure of the water flow up to 8-9 bar.

If necessary, the exchanger 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.



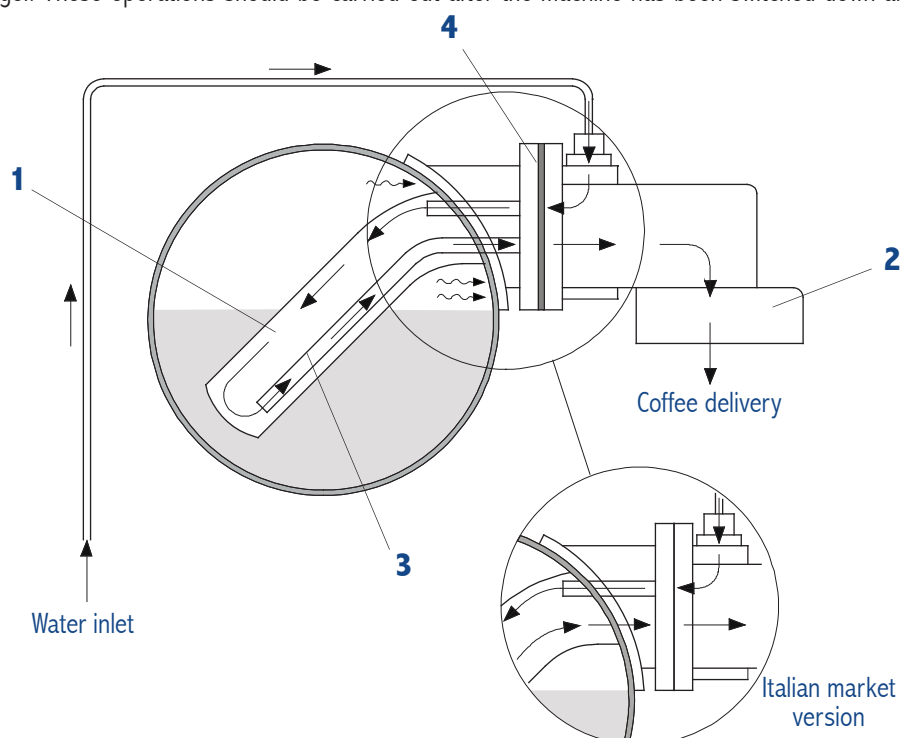
## 5.3 EXTRACTABLE EXCHANGER SYSTEM

Heating of the delivery group is provided by direct contact with the boiler. Water used for delivery of coffee is taken from a so-called "extractable" exchanger which is immersed in the water of the boiler:

- the activation of the solenoid valve and of the pump allows cold water to enter the exchanger **(1)**.
- from the exchanger **(1)** the boiler water is carried to the group **(2)** for delivery;
- the pump allows the increase of the pressure of the water flow up to 8-9 bar.

The version of the extractable exchanger for the Italian market does not include the intake device **(3)** and the seal **(4)**.

If necessary, the exchanger can be replaced without having to remove the flange: loosen the screws, remove the delivery group from the boiler and remove the exchanger. These operations should be carried out after the machine has been switched down and has cooled off: always replace the seals.



## 5.4 CTS SYSTEM (thermosiphon system)

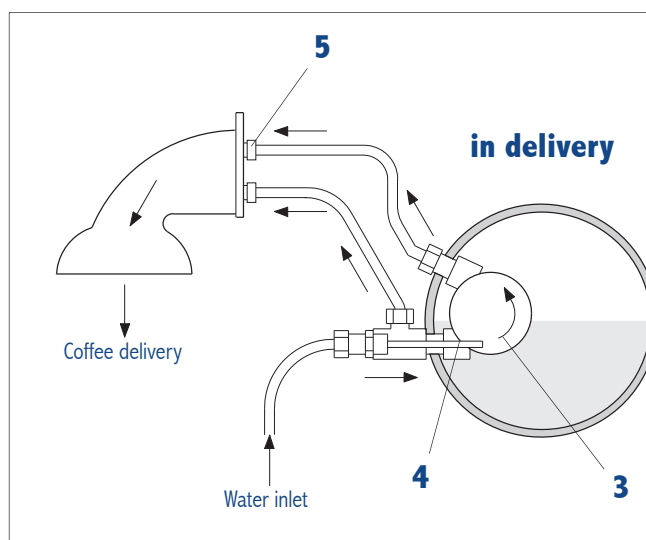
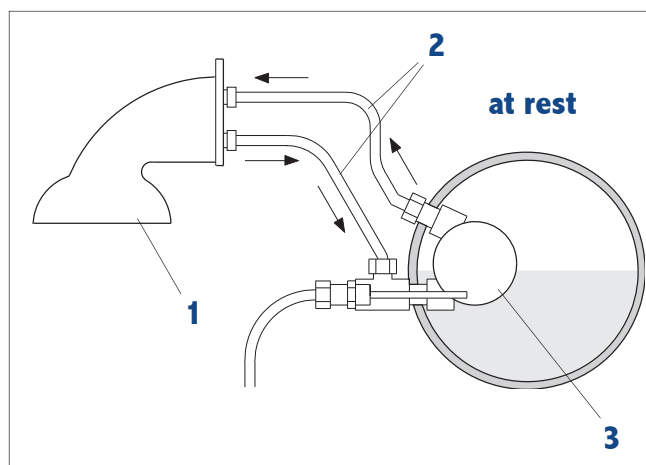
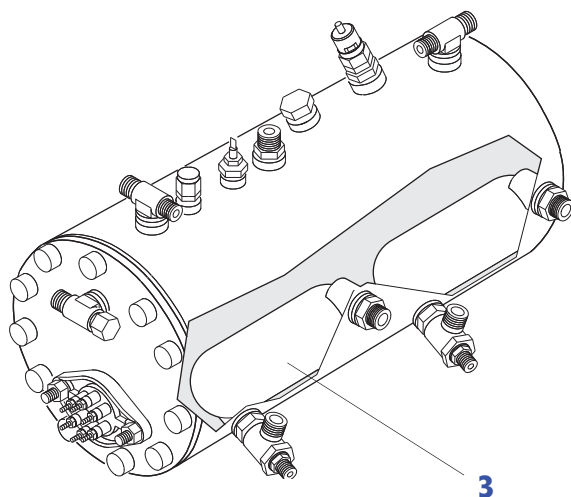
In this system, the delivery group **(1)** is heated by a thermosiphon circuit **(2)** connected to the heat exchanger **(3)**. The same water is used for the coffee delivery, thus ensuring the same temperature for all coffee servings:

- 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.

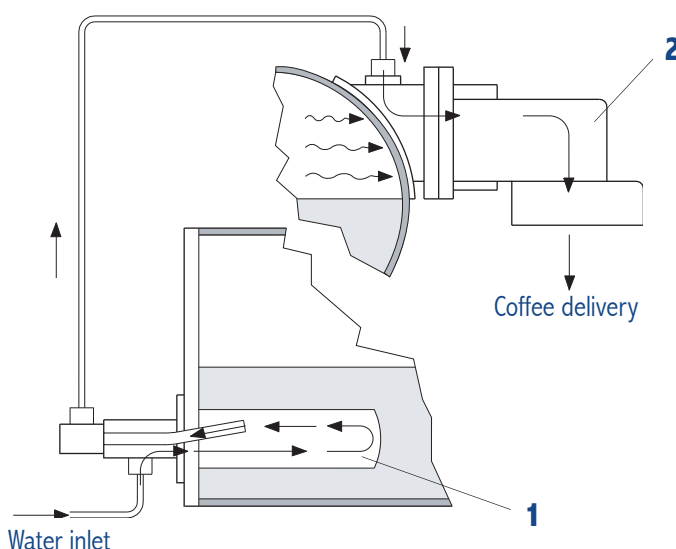


## 5.5 BOOSTED SYSTEM

Heating of the delivery group is provided by direct contact with the boiler. Water used for delivery of coffee is taken from an exchanger which is immersed in the water of the boiler and attached to the flange:

- the activation of the solenoid valve and of the pump allows cold water to enter the exchanger **(1)**.
- from the exchanger **(1)** the boiler water is carried to the group **(2)** for delivery;
- the pump allows the increase of the pressure of the water flow up to 8-9 bar.

The exchanger can be replaced without having to remove the flange: loosen the screws, and detach the flange that holds the exchanger. Perform these operations when the machine is off and is cool. Always replace the seals.



## 6. AUTOMATIC WATER ENTRY

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

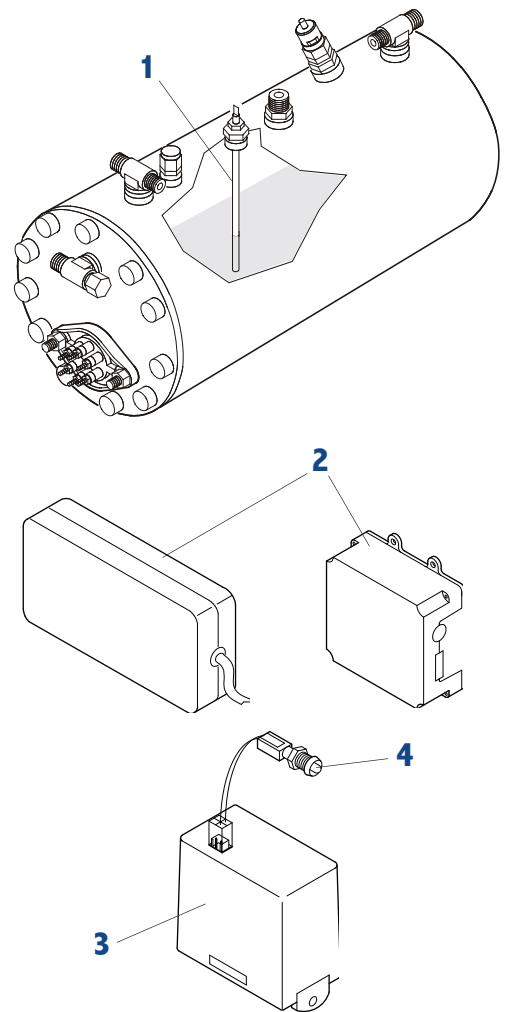
- probe inserted in the boiler **(1)**, composed of a stainless steel rod
- standard control unit **(2)** on SAE-SME machines, electronic level regulator on the other versions **(3)**;
- hydraulic circuit with a solenoid valve controlled by the regulator.

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.

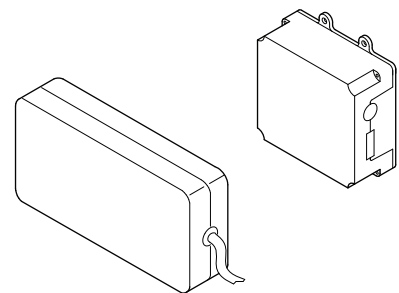
Some versions of the control unit are set up to be connected to the delivery accounting systems by means of a specific interface device.

### 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.*

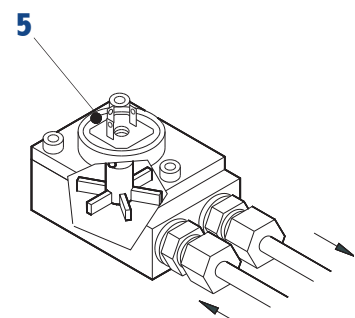


## 8. VOLUMETRIC DOSING

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.

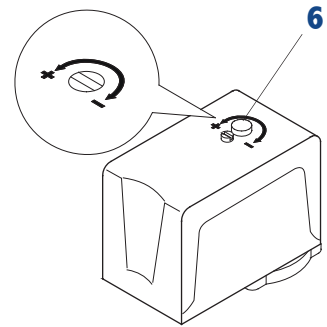
The flashing of the LED **(5)** indicates that the electrical impulse has been sent from the dosing device to the control unit.



## 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

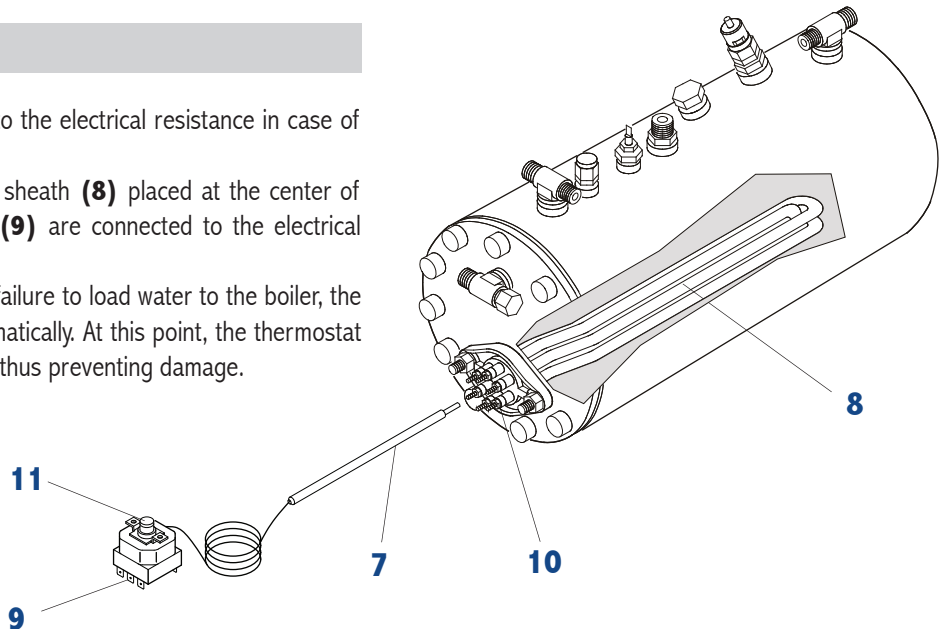
*The internal contacts of the pressure switch may be subject to oxidation. It is recommended to clean the contacts regularly spraying them with antioxidants.*

## 10. 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.

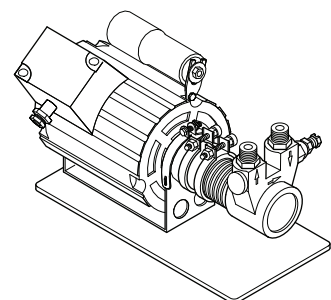


### ATTENTION

*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*

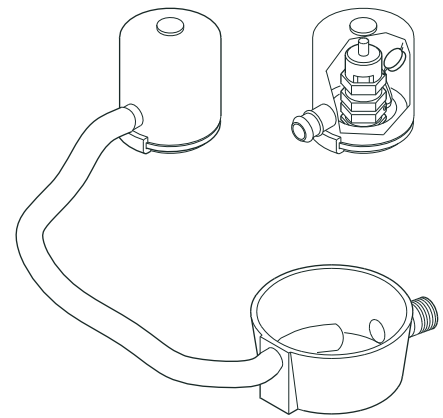
## 11. PUMPING SYSTEM

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. 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.

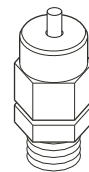


## 13. VALVE GROUP

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

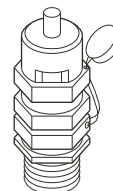
### 13.1 NEGATIVE PRESSURE VALVE

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

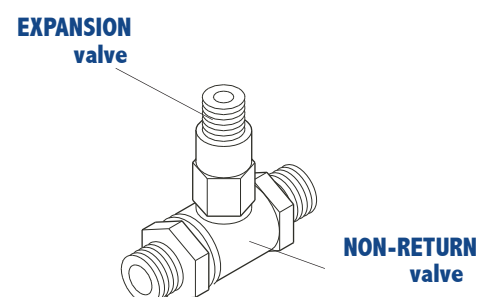
The pressure relief valve guarantees that the pressure in the boiler does not go above 2 bar. In case of failure of the boiler's monitoring system, the valve can eliminate all the excess pressure from the boiler.



### 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

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

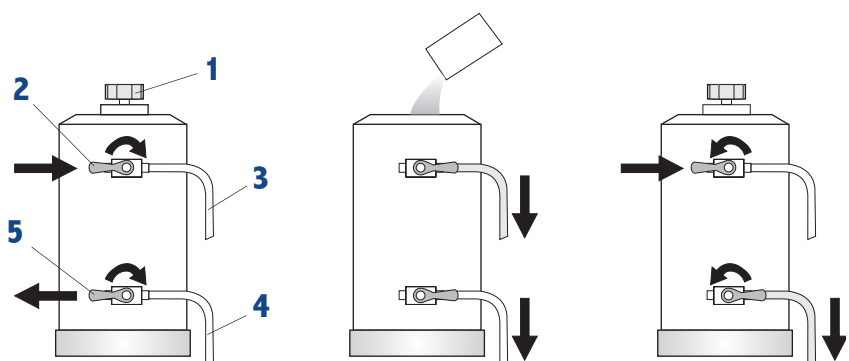
The resin softener has the property of retaining the calcium contained in the water. For this reason, the resins become saturated after a certain period and must be regenerated with coarse kitchen salt (NaCl, sodium chloride) or special water softening salt. It is very important to regenerate the softener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



Softener model	Amount of salt
8 litres	1.0 kg
12 litres	1.5 kg
16 litres	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 CaCO<sub>3</sub>

Amount of softened water based on hardness					
f°	30°	40°	60°	80°	salt
D°	16.5°	22°	33°	44°	
mg CaCO <sub>3</sub>	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.



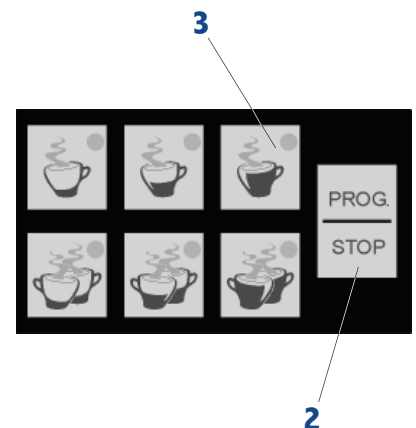
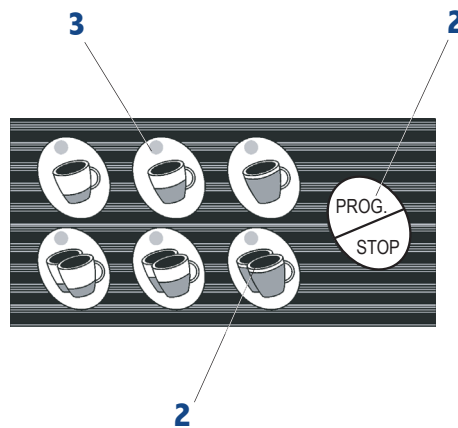
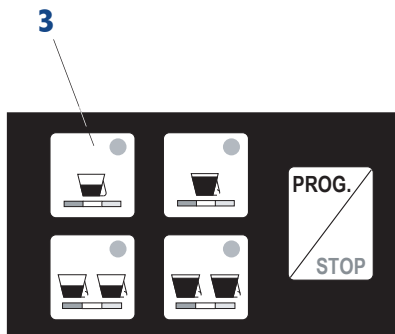
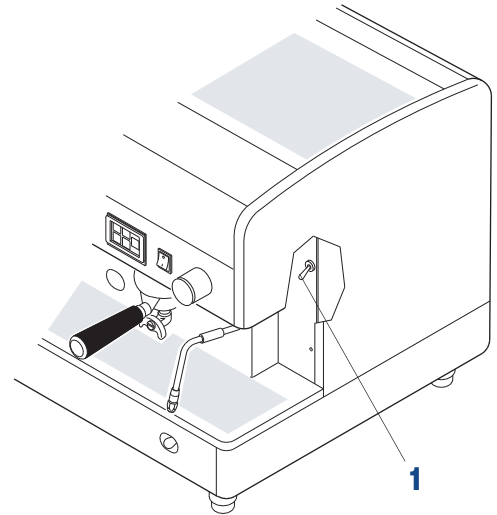
## 15. ELECTRONIC PUSH BUTTON PANELS

### 15.1 SAE - SME PUSH BUTTON PANEL

The push button panel is connected to the control unit which allows selection and programming of the doses of coffee.

Programming is carried out in the following way:

- place the programming lever **(1)**, located under the boiler cover of the machine, in the ON position;
- place the coffee cup under the dispensing spout;
- press the PROG/STOP key **(2)** and all dose key LED will come on;
- press the desired dose button **(3)**
- when the desired dose has been attained, confirm by pressing the PROG/STOP button **(2)**;
- repeat this operation for the other dose buttons;
- when finished programming, return the programming lever **(1)** to the OFF position.



In some models, the programming lever has been eliminated because to access program, and it is enough to press the PROG/STOP key for at least 5 seconds with all push button panel LED coming on. Also, confirmation of the dose can be given by pressing either the PROG/STOP key or the selected dose key.

In other models, to access programming it is necessary to use a special key switch.

To exit programming it is sufficient to wait a few seconds.

#### NOTE

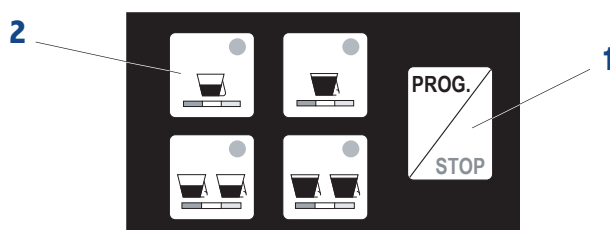
*The programming of every dose must be done with ground coffee and not with previously used grounds. With machines having two or three groups, by first programming the right-hand push buttons the others are automatically programmed. It is however both possible and advisable to program the push button panels independently, always starting from the right-hand push button panel.*

## 15.2 TH JUNIOR PUSH BUTTON PANEL

This push button panel is installed mainly on JUNIOR models and on some SAE-SME volumetric dosing machines.

Programming is carried out in the following way:

- place the programming lever, located under the boiler cover of the machine, in the ON position;
- place the coffee cup under the dispensing spout;
- Press the PROG/STOP key **(1)** for at least 5 seconds until all dose key LED are on;
- press the desired dose key **(2)**;
- to confirm the dose press the dose key **(2)** or the PROG/STOP key (1).
- repeat this operation for the other dose buttons;
- Programming will be terminated automatically after a few seconds.

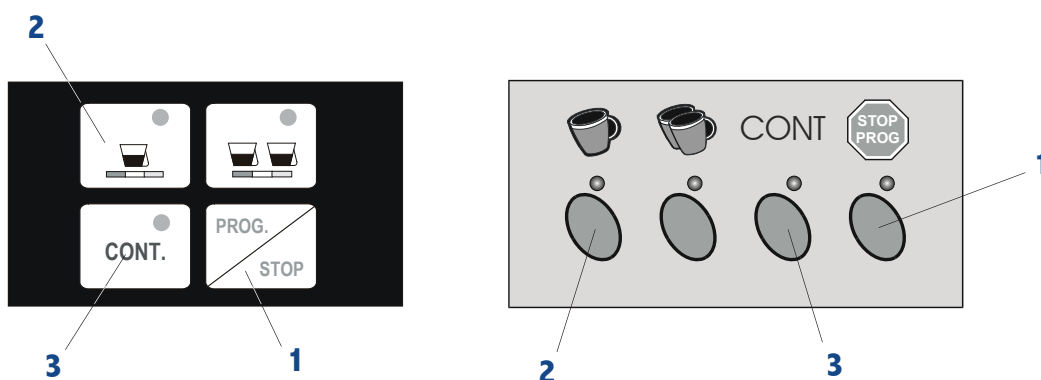


## 15.3 AEAP - SMAT TIMER PUSH BUTTON PANEL

The timer is installed on AEAP-SMAT machines and controls delivery time of the coffee.

Programming is carried out in the following way:

- 1) Press and hold down the STOP/PROG key **(1)** for 5 seconds and check that all of the LED on the push button panel come on. This confirms correct entry into the programming phase.
- 2) Press one of the two dose keys **(2)** to program. The LED corresponding to the CONT key (continue) and to the key of the dose being programmed stay on.
- 3) When the desired amount of coffee in the cup has been reached, press the STOP/PROG key **(1)** or the key of the dose being programmed to stop delivery and memorize the new value (the duration of the dose of coffee is calculated in seconds). At the same time, the LED for the dose which is still to be programmed comes back on, while the LED for the programmed dose stays off.
- 4) Proceed with the programming of the other coffee dose by pressing the other dose key. Once the desired amount of coffee in the cup has been reached, press the dose key or the STOP/PROG again **(1)**.
- 5) To exit programming, press and hold down the STOP/PROG **(1)** key for more than 5 seconds.



### NOTE

*It is possible to re-program the coffee dose that you have just finished programming (LED off) without necessarily having to turn the system off and back on or exiting the programming phase.*

*The system automatically exits programming status approximately 10 seconds after the last operation.*

## 16. PREPARATION OF HOT BEVERAGES

### 16.1 MANUAL DISPENSING OF HOT WATER

Place the cup under the hot water nozzle **(2)** and turn the tap knob **(1)** counterclockwise: the steam 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 clockwise **(1)**.

### 16.2 AUTOMATIC HOT WATER DELIVERY

#### Programming

- place the programming lever **(4)** in the ON position. It is located under the front right-hand panel of the body (in some versions to start operating it will be sufficient to turn the programming key or hold down the PROG/STOP **(5)** key for 5 seconds);
- Put the cup under the hot water spout **(2)**;
- press the PROG/STOP button **(5)** of the first right-hand push-button panel; all the dose button LEDs will come on;
- press the hot water delivery key **(3)**;
- upon reaching of the desired serving, confirm pressing the key **(3)** again;
- to exit programming press the PROG/STOP key **(5)**;
- upon completion of programming, place the programming lever **(4)** back in the OFF position.

#### Dispensing hot water

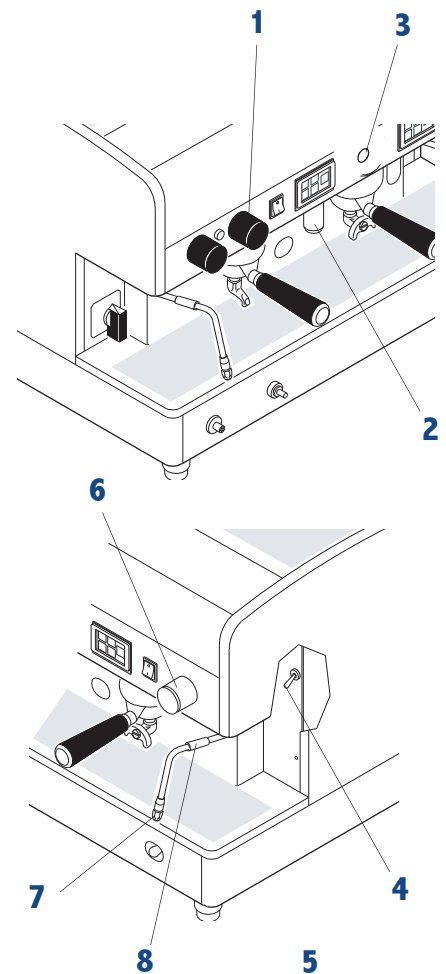
- Put the cup under the hot water spout **(2)**;
- press the hot water key **(3)**: wait for the delivery of water;
- To stop delivery in advance, press the hot water dispensing key again **(3)**.

### 16.3 DISPENSING STEAM

To dispense steam, turn the tap knob **(6)** counter-clockwise: the steam coming out of the nozzle **(7)** will be proportional to the opening of the tap.

#### ATTENTION

*Carefully move the steam nozzle with the anti-burn nozzle **(8)** and do not touch the hot water nozzle: contact with the hot water and steam may be harmful to individuals, animals or property.*



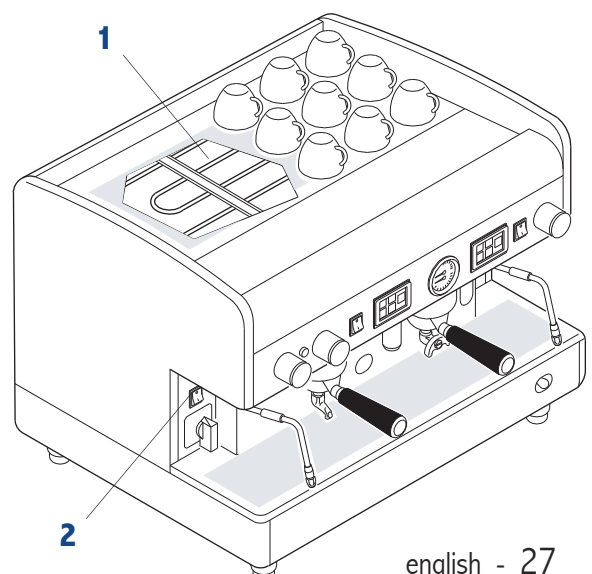
## 17. CUP HEATING DEVICE

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)** or, for some models, with the push button panel.

#### ATTENTION

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



## 18. AUTSTEAMER

### 18.1 GENERALITY

The "Autsteamer" system, supplied with certain machines with display, can be used for automatically heating and foaming milk at the programmed temperature.

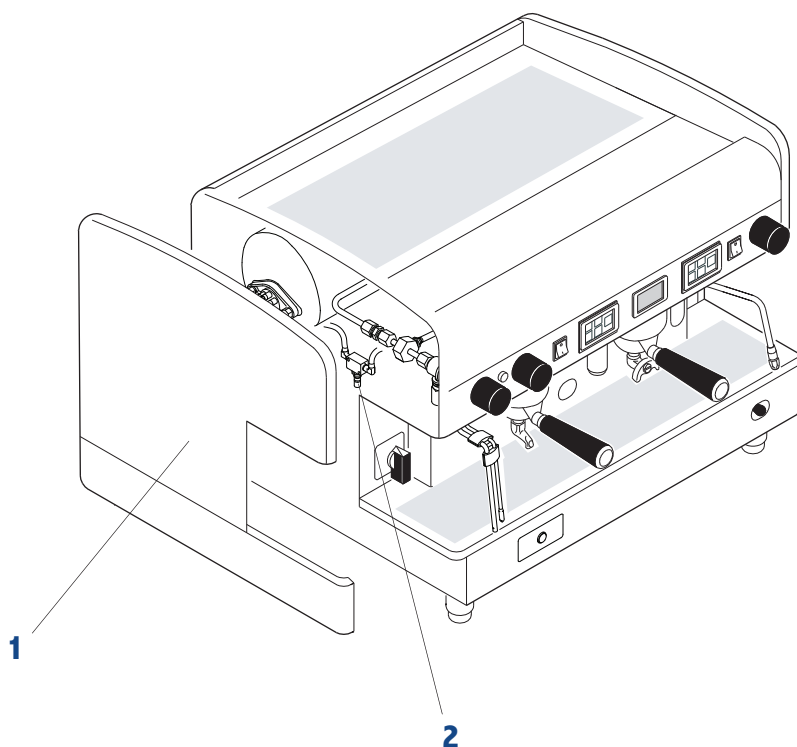
### 18.2 SETTING THE TEMPERATURE

To program the temperature of the milk to be heated, enter the machine programming through the display and set the desired temperature. However, we recommend not to exceed 60° C.

### 18.3 ADJUSTING MILK FOAMING

To adjust the milk foaming through the autsteamer, proceed as follows:

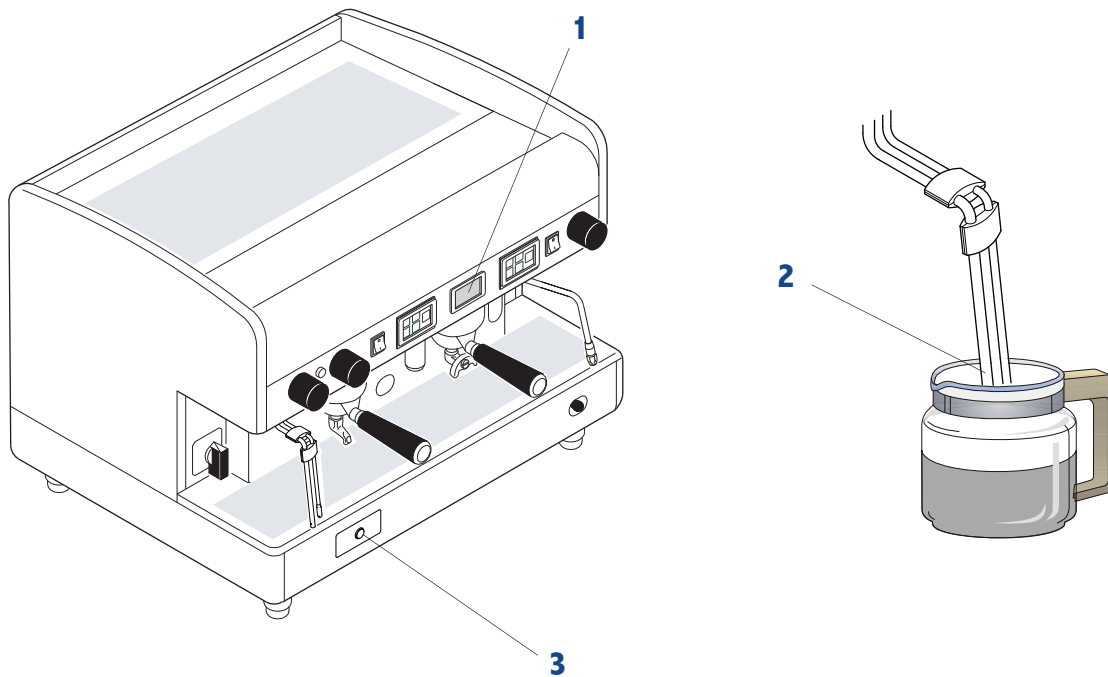
- 1) Remove the left side panel from the machine **(1)**;
- 2) turn the screw of the adjustment valve **(2)** :
  - to reduce foaming turn clockwise
  - to increase foaming turn counter-clockwise
- 3) place the side back **(1)** on the machine.



## 18.4 USE

Proceed as follows:

- 1) Through the display **(1)** program the autosteamer temperature;
- 2) immerse the tips of the autosteamer **(2)** into the milk;
- 3) press the key **(3)**;
- 4) wait for steam delivery to be completed;
- 5) when the delivery is finished, the milk will be foamed and heated at the preset temperature.
- 6) To stop dispensing ahead of time, press the key **(3)** again.



### NOTE

*Before using the steam to heat or foam milk, you should first let some steam off until all the condensation water is released.*

*To keep the steam dispensers in perfect working order, it is advisable to carry out a brief dry delivery after each use.*

*Attention: if regular cleaning is not carried out, the proper operation of the autosteamer can be compromised.*

*To obtain optimal foaming, it is recommended to:*

- use cold milk - about 4°C ;
- use a container with a capacity of 0.75 litres and half-fill it with milk;
- set a maximum heating temperature of 60 °C.

### ATTENTION

*Keep the tips of the autosteamer clean at all times using a cloth dampened in lukewarm water.*

*Handle the autosteamer with utmost caution due to the hazard resulting from the presence of high-temperature steam.*

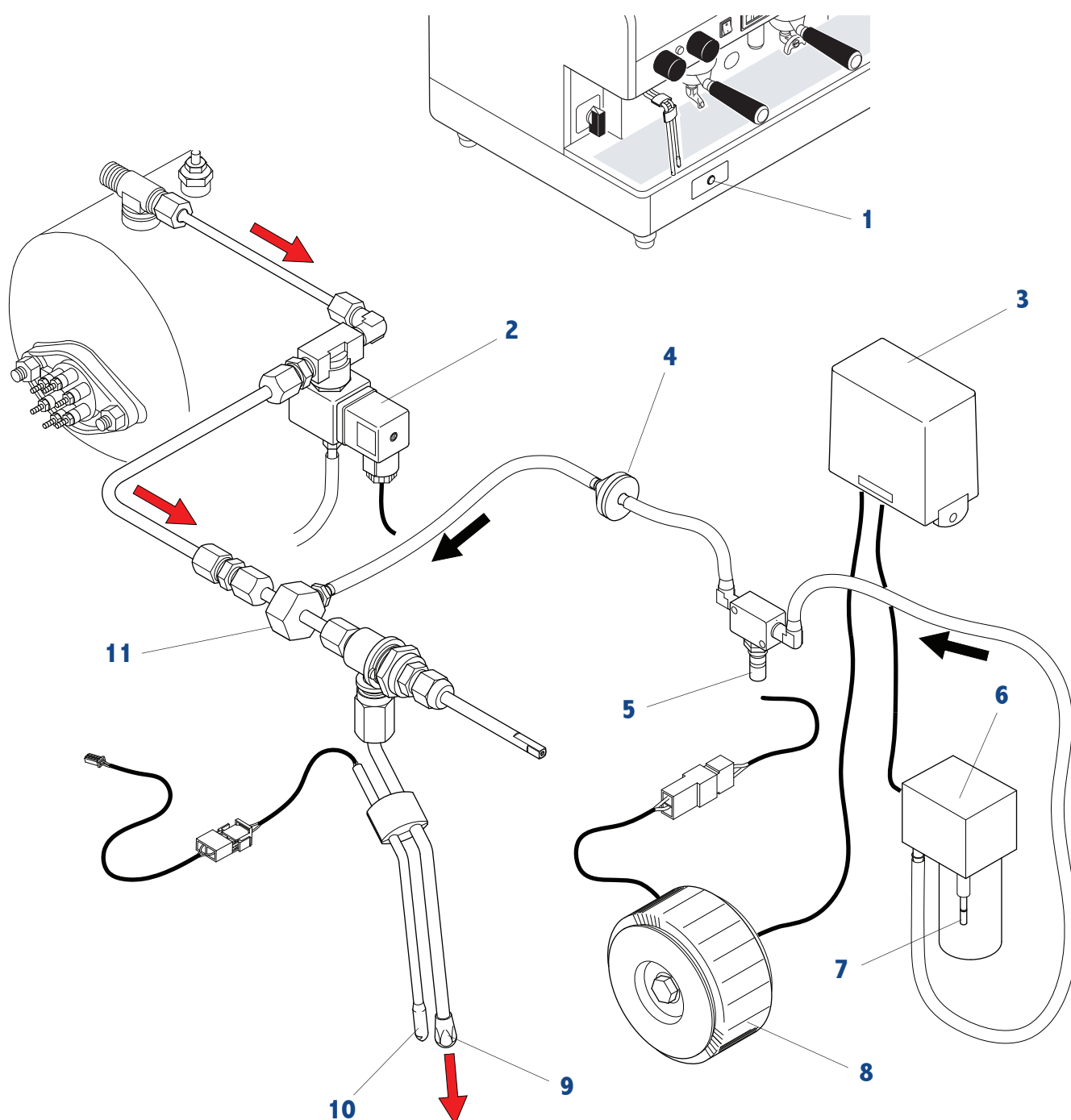
*Do not keep the autosteamer nozzle immersed in milk for a long time, but only for the milk foaming.*

*The system includes a time limit of a maximum of 4 minutes for autosteamer operation.*

## 18.5 AUTOSTEAMER SYSTEM OPERATION

Below is listed the operating principle of the autosteamer:

- press the appropriate button **(1)** placed on the base to the left of the machine;
- opening of the solenoid valve **(2)** with consequent flow of steam from the boiler to the autosteamer;
- simultaneously, the system activates the air pump **(6)** which is controlled by the control unit **(3)** and powered by a processor **(8)**. The regulation of milk foaming can be made by changing the amount of air intake operating the valve **(5)** as indicated in par. 18.3;
- after passing through the non-return valve **(4)**, the air mixes with the steam in the "autosteamer interface" **(11)**;
- leakage of steam from the pipe **(9)**;
- the probe **(10)** connected to the electronic unit of the machine detects the temperature of the heating milk;
- Once the set temperature of the milk has been reached, the electronic system blocks the flow of air and steam.



## 19. HEATED STORAGE

This is composed of a recipient where a substantial amount of coffee is produced (2.5 litres) which is stored in reserve when there is high demand for this beverage (breakfasts, conferences, etc.).

### Preparation

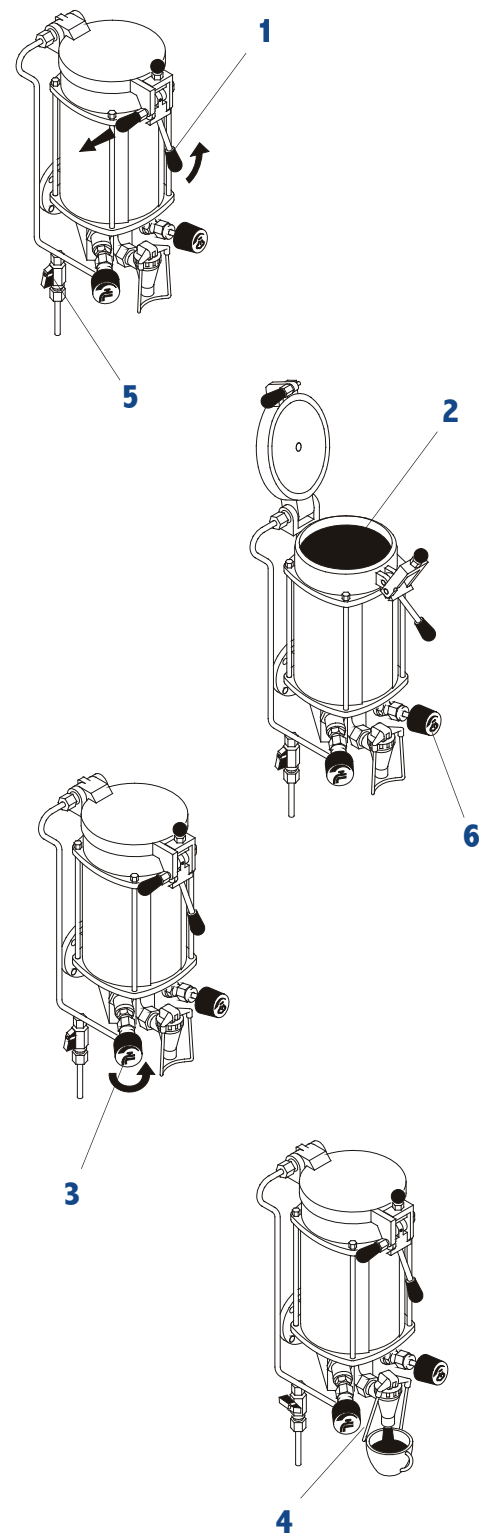
- raise the lid **(1)** pulling the knob to the left and raising the lever;
- place the ground coffee (about 130 gr.) into the specific filter **(2)** and close it triggering the knob in safety position;
- open the water tap **(3)** by turning it counter-clockwise. Upon reaching the desired amount (maximum capacity 2.5 litres) close the tap;
- when the operation is complete, residual pressure must be discharged with the discharge valve **(5)** located under the heat storage group.

### Dispensing

Coffee is drawn from the container by using the lever of the dispenser **(4)** located in the middle of the lower part. The remaining coffee can be heated by means of a steam tap **(6)** located on the right hand side.

### ATTENTION

*Always open the bleed valve **(5)** before opening the lid. Failure to do so may cause serious harm to property, individuals or animals.*





## 20. CAPPUCCINO MAKER

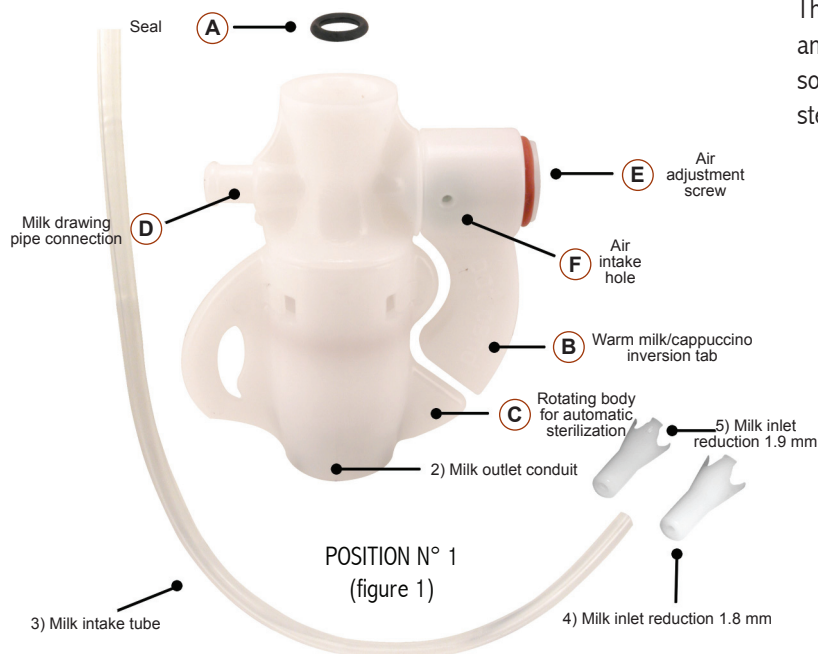
### 20.1 INSTALLATION

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.

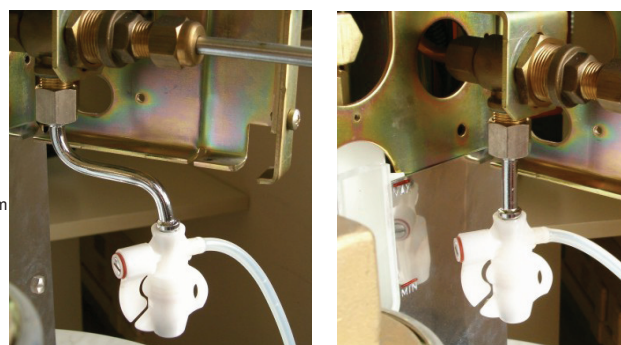
Ensure that seal A is present and/or use Teflon tape in order to avoid steam loss which may compromise the cappuccino makers operation.

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



### 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 (fig.1). 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 (fig.1) 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 CAPPUCCINO

Ensure that the cappuccino maker is in position 1 (fig.1). Open up the steam by using a screw-driver 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.



(figure 4)

## 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)



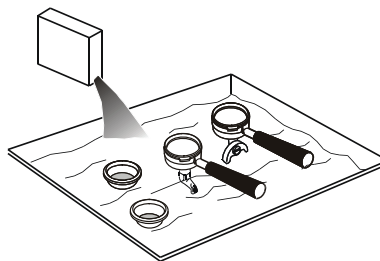
POSITION 3  
(figure 3)

## 21. CLEANING

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

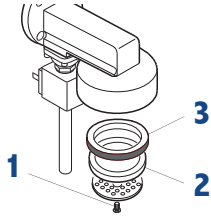
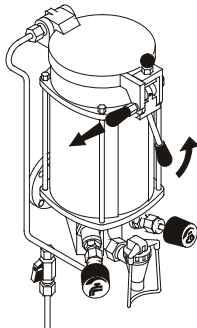
Before cleaning the machine, turn it off the machine and let it cool off.

CLEANING	Daily	Weekly
<p><b>FILTERS and FILTER HOLDERS</b></p> <p>In case of temporary interruption of the machine for more than 4 hours, before resuming the activity it is necessary to attach the filter holders to the group and make an empty delivery for at least 10 seconds.</p>	<b>X</b>	
<p><b>FILTERS and FILTER HOLDERS</b></p> <p>The filters and filter-holders must be cleaned daily in hot water.</p> <p>The best thing to do is to let them soak in hot water overnight so that the fatty coffee deposits can dissolve.</p> <p>It is advisable to add special detergent to the water, and then to rinse everything off with water.</p> <p>Failure to clean the filter holders daily will compromise the quality of the coffee and the filterholder correct operation.</p>	<b>X</b>	
<p><b>BODY</b></p> <p>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>	<b>X</b>	
<p><b>STEAM NOZZLE AND AUTOSTEAMER</b></p> <p>Clean the steam nozzle and autosteamer making a quick delivery till empty after each use and clean with a cloth dampened with warm water.</p>	<b>X</b>	
<p><b>DELIVERY GROUP (except for the AL - SMMA version)</b></p> <p>Wash the units as indicated:</p> <ol style="list-style-type: none"> <li>1) use the solid filter holder;</li> <li>2) pour the special detergent (see spare parts) into the solid filter and attach the filter holder;</li> <li>3) dispense a series of servings until the water comes out clean;</li> <li>4) remove the filter holder from the unit and dispense some servings so as to eliminate the detergent residue.</li> </ol>	<b>X</b>	



### ATTENTION

*Do not use a solid filter to clean the machines with a lever group (AL-SMMA).*

CLEANING		Daily	Weekly
<p><b>PERFORATED DISK and CONTAINMENT RING</b></p> <p>Clean the perforated disk <b>(2)</b> and its containment ring <b>(3)</b> in hot water. To do this, loosen the screw <b>(1)</b> and remove the two elements from the dispensing unit.</p>			<b>X</b>
<p><b>STEAM NOZZLE AND AUTOSTEAMER</b></p> <p>Check and clean the terminals of the steam nozzles, using a small needle to reopen the exit holes.</p>			<b>X</b>
<p><b>GRINDER-DOSER</b></p> <p>Every week clean the bell jar and the dosing device with a cloth soaked in lukewarm water, both inside and out, then dry everything.</p>			<b>X</b>
<p><b>HEATED STORAGE</b></p> <p>Once the coffee in the heated storage container is finished, clean it as follows:</p> <ol style="list-style-type: none"> <li>1) remove the filter using a cloth and avoiding direct contact with the hot parts;</li> <li>2) empty the coffee grounds out of the filter and wash it with lukewarm water;</li> <li>3) remove the plastic funnel and wash it with lukewarm water;</li> <li>4) clean the container with a damp cloth and dry it;</li> <li>5) put the filter and funnel back in place.</li> </ol>			<b>X</b>

**NOTE**

When cleaning, always use cloths that are completely clean and hygienic.

**ATTENTION**

Do not immerse the machine into water.

Never use alkaline detergents, solvents, alcohol or aggressive substances.

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. 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

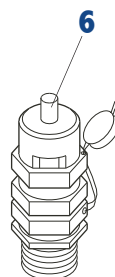
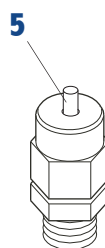
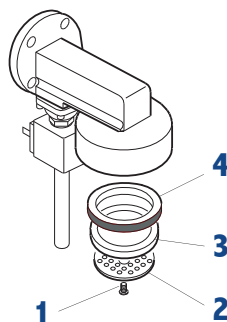
To ensure perfect safety and efficiency of the machine over time, it is necessary to carry out routine, preventive and special maintenance. In particular, it is advisable to carry out an overall check of the machine at least once a year.

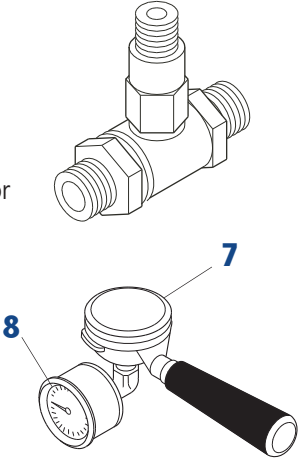
### ATTENTION

*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
<b>MACHINE</b> Carry out the cleaning as described in the previous chapter.	<b>X</b>		
<b>MACHINE</b> Every four months replace the perforated disk <b>(2)</b> and the undercup seal <b>(4)</b> of the delivery group (use only original spare parts) proceeding as follows: 1) loosen the screw <b>(1)</b> ; 2) remove the containment ring <b>(3)</b> ; 3) replace the perforated disk of the group <b>(2)</b> and the rubber seal under the pad <b>(4)</b> ; 4) reassemble the components.		<b>X</b>	
<b>VALVES</b> 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:  <b>NEGATIVE PRESSURE VALVE</b> 1) first try : - remove the top grill of the machine; - use pliers to push the pin <b>(5)</b> downwards; - If the pin does not move, it probably means the valve is encrusted with limestone and must be replaced. 2) second try : - turn the machine off; - open the steam valves and drain off all the pressure from inside the boiler; - turn the machine back on and check for regular closure of the valve.			<b>X</b>
<b>SAFETY OR PRESSURE RELIEF VALVE</b> 1) first try : - remove the top grill of the machine; - use pliers to pull the pin <b>(6)</b> upwards; - If the pin does not move, it probably means the valve is encrusted with limestone and must be replaced. 2) second try : - turn the machine off; - block the pressure switch contacts; - turn the machine back on and check for pressure in the boiler to rise; - check for correct intervention of the valve at a maximum pressure of 2 bar.			<b>X</b>



INTERVENTION	Weekly	Monthly	Yearly
<p><b>NON-RETURN DRAIN VALVE</b></p> <ul style="list-style-type: none"> <li>- Activate the delivery groups for about 30 seconds;</li> <li>- attach a filter holder <b>(7)</b> with a gauge (available on request) to the delivery group;</li> <li>- activate the delivery group, and use the gauge <b>(8)</b> to monitor pressure increase up to 8-9 bar;</li> <li>- 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;</li> <li>- de-activate the deliveries;</li> <li>- repeat the control on the other delivery groups.</li> </ul> 			<b>X</b>
<p><b>GAUGE</b></p> <p>Monitor the boiler pressure value as explained in chapter 1, "Technical Characteristics".</p>	<b>X</b>		
<p><b>GAUGE</b></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>		<b>X</b>	
<p><b>FILTERS and FILTER HOLDERS</b></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>		<b>X</b>	
<p><b>GRINDER-DOSER</b></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>		<b>X</b>	
<p><b>SOFTENER</b></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>		<b>X</b>	
<p><b>PRESSURE GAUGE AND PRESSURE SWITCH</b></p> <p>Check for proper operation of the pressure gauge and pressure switch.</p>			<b>X</b>
<p><b>HYDRAULIC CIRCUIT</b></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>			<b>X</b>
<p><b>DISPENSER UNIT</b></p> <p>Check the condition of the solenoid valve of the delivery group.</p>			<b>X</b>
<p><b>DRAIN</b></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>			<b>X</b>



## 23. MALFUNCTIONS and CORRESPONDING SOLUTIONS

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

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
GROUND 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-SME : 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



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
THE PUMP FUNCTIONS BELOW NOMINAL CAPACITY	1) The inlet is clogged, perhaps only partially 2) The pump rotates in the wrong direction 3) The pressure relief valve is not properly calibrated 4) The motor runs at a low RPM 5) The inside of the pump is damaged due to the infiltration of foreign matter	1) Clean the filter holder 2) Check the motor 3) Calibrate the pressure relief valve 4) Check the voltage or replace the motor 5) Replace the pump
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



## 24. 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.

### **Lever machines**

Never lower the lever if there is no coffee in the filter, or if the filter holder is not installed on the group: the sudden upwards movement of the lever may damage the appliance and injure individuals.

### **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

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## USE AND MAINTENANCE MANUAL

Instructions for the technician

### HYDRAULIC DIAGRAMS

# ENGLISH

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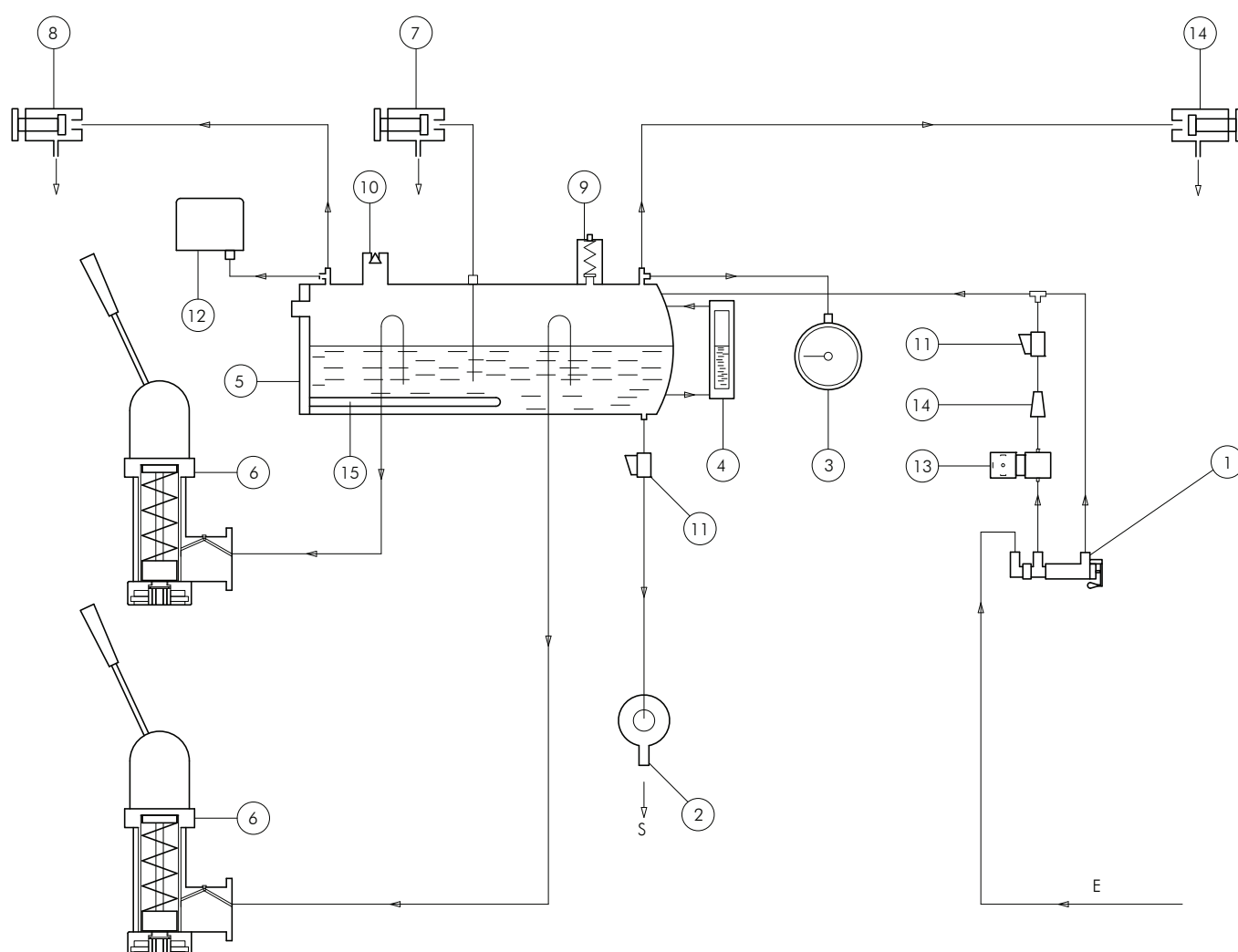


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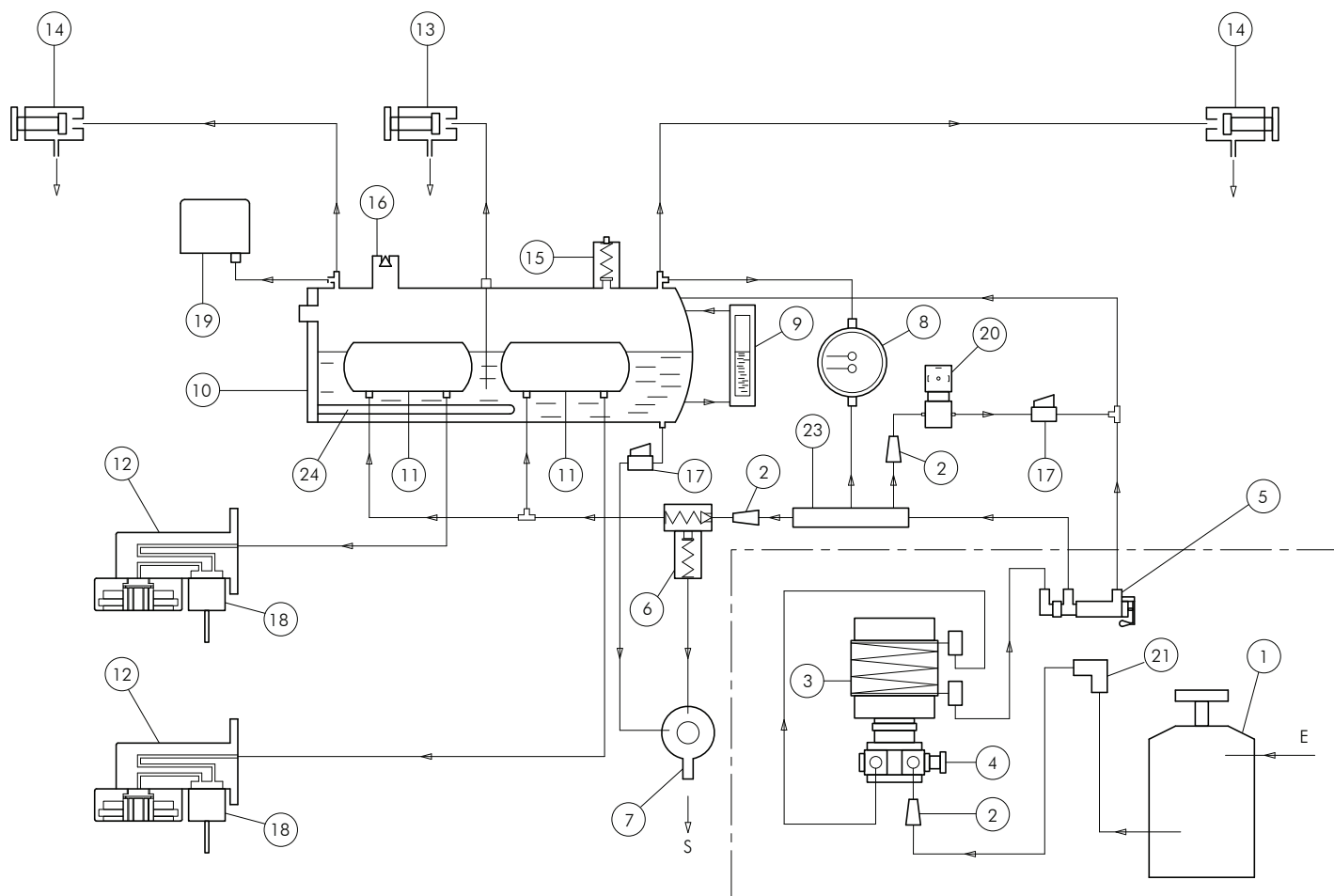


# 1. LEVER GROUP hydraulic diagram

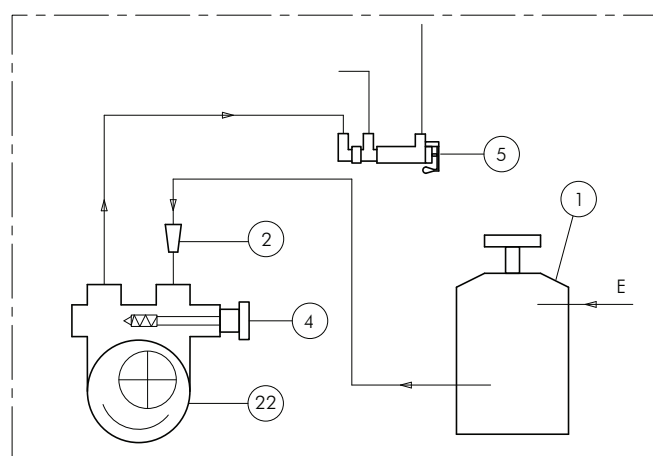


- |           |   |
|-----------|---|
| <b>1</b>  | Manual water inlet tap                          |
| <b>2</b>  | Drain tub                                       |
| <b>3</b>  | Gauge   |
| <b>4</b>  | Boiler level-check window                       |
| <b>5</b>  | Boiler  |
| <b>6</b>  | Delivery group                                  |
| <b>7</b>  | Hot water tap                                   |
| <b>8</b>  | Steam tap                                       |
| <b>9</b>  | Safety valve                                    |
| <b>10</b> | Negative pressure valve                         |
| <b>11</b> | Tap   |
| <b>12</b> | Pressure switch                                 |
| <b>13</b> | Automatic Water Inlet Solenoid Valve (optional) |
| <b>14</b> | Water inlet filter                              |
| <b>15</b> | Boiler heating element                          |
| <b>E</b>  | Water inlet                                     |
| <b>S</b>  | Drain   |

## 2. AEP-SMSA CARTRIDGE EXCHANGER hydraulic diagram



**Internal motor pump**



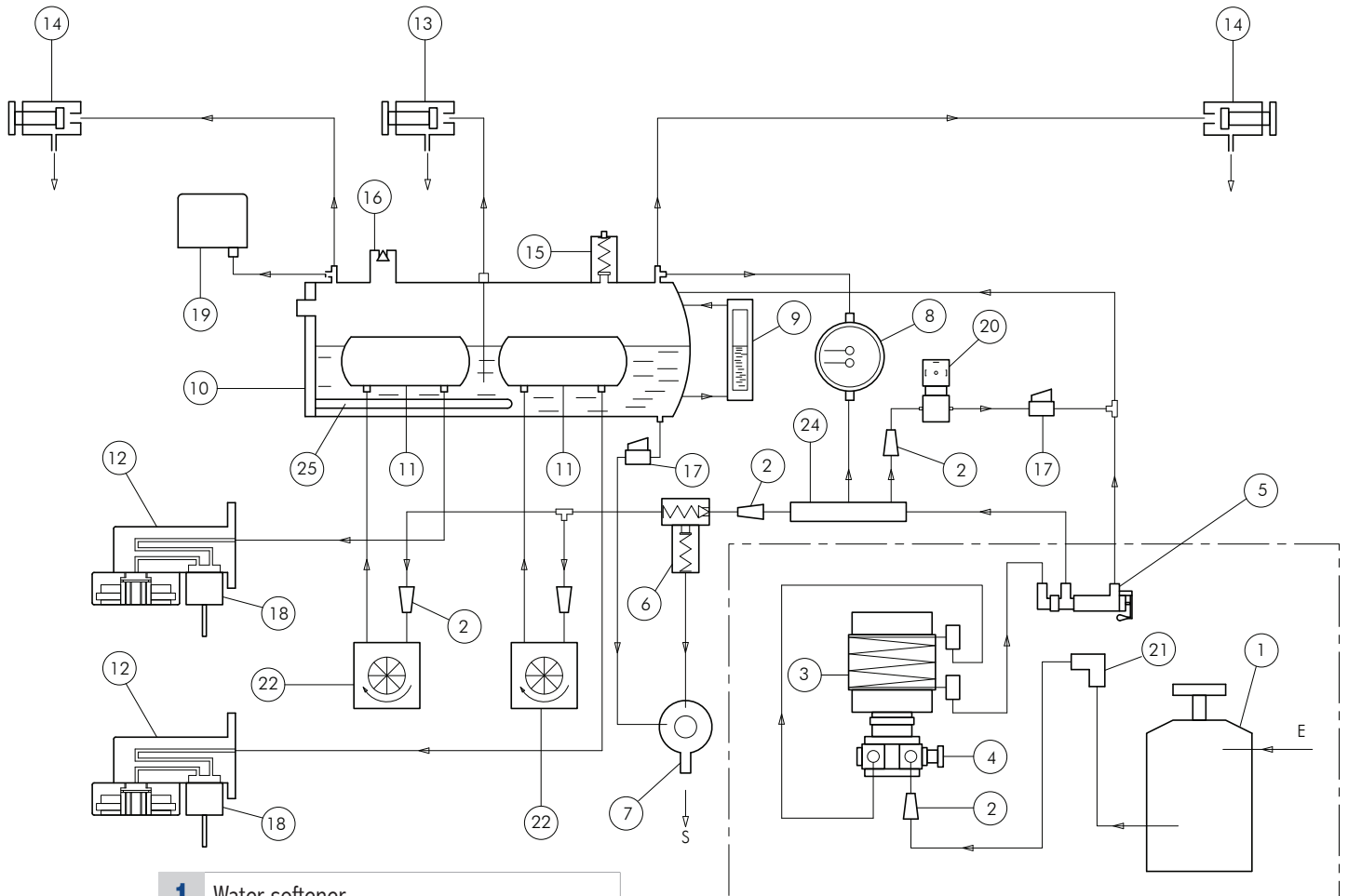
**External motor pump**

- 1 Water softener
- 2 Water inlet filter
- 3 Built-in motor pump
- 4 Pump pressure adjustment
- 5 Manual water inlet 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 External motor pump
- 23 Water distributor
- 24 Boiler heating element

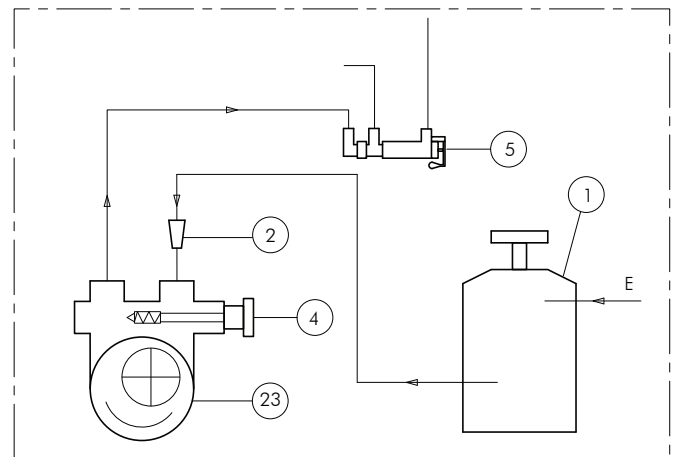
**E** Water inlet  
**S** Drain



### 3. SAE-SME CARTRIDGE EXCHANGER hydraulic diagram



**Internal motor pump**

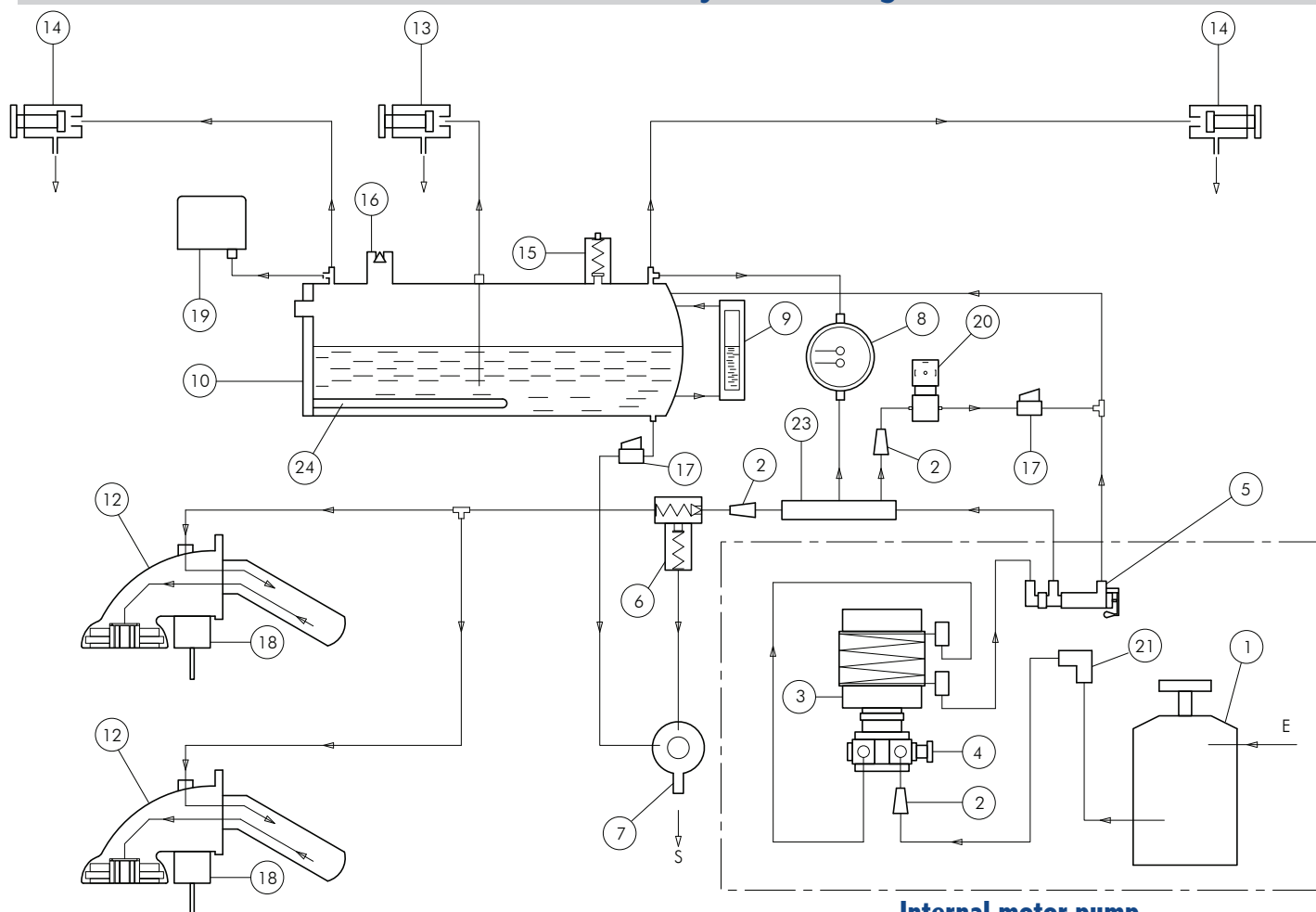


**External motor pump**

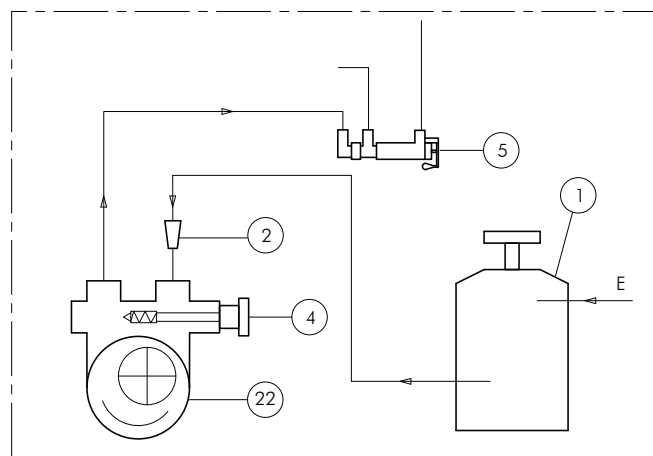
- 1** Water softener
- 2** Water inlet filter
- 3** Built-in motor pump
- 4** Pump pressure adjustment
- 5** Manual water entry tap
- 6** SCNR valve
- 7** Drain tub
- 8** Gauge
- 9** Level-check window
- 10** Boiler
- 11** Heat exchanger
- 12** Delivery group
- 13** Hot water tap
- 14** Steam tap
- 15** 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** Volumetric dosing device
- 23** External motor pump
- 24** Water distributor
- 25** Boiler heating element

**E** Water inlet  
**S** Drain

#### 4. AEP-SMSA EXTRACTABLE EXCHANGER hydraulic diagram



**Internal motor pump**

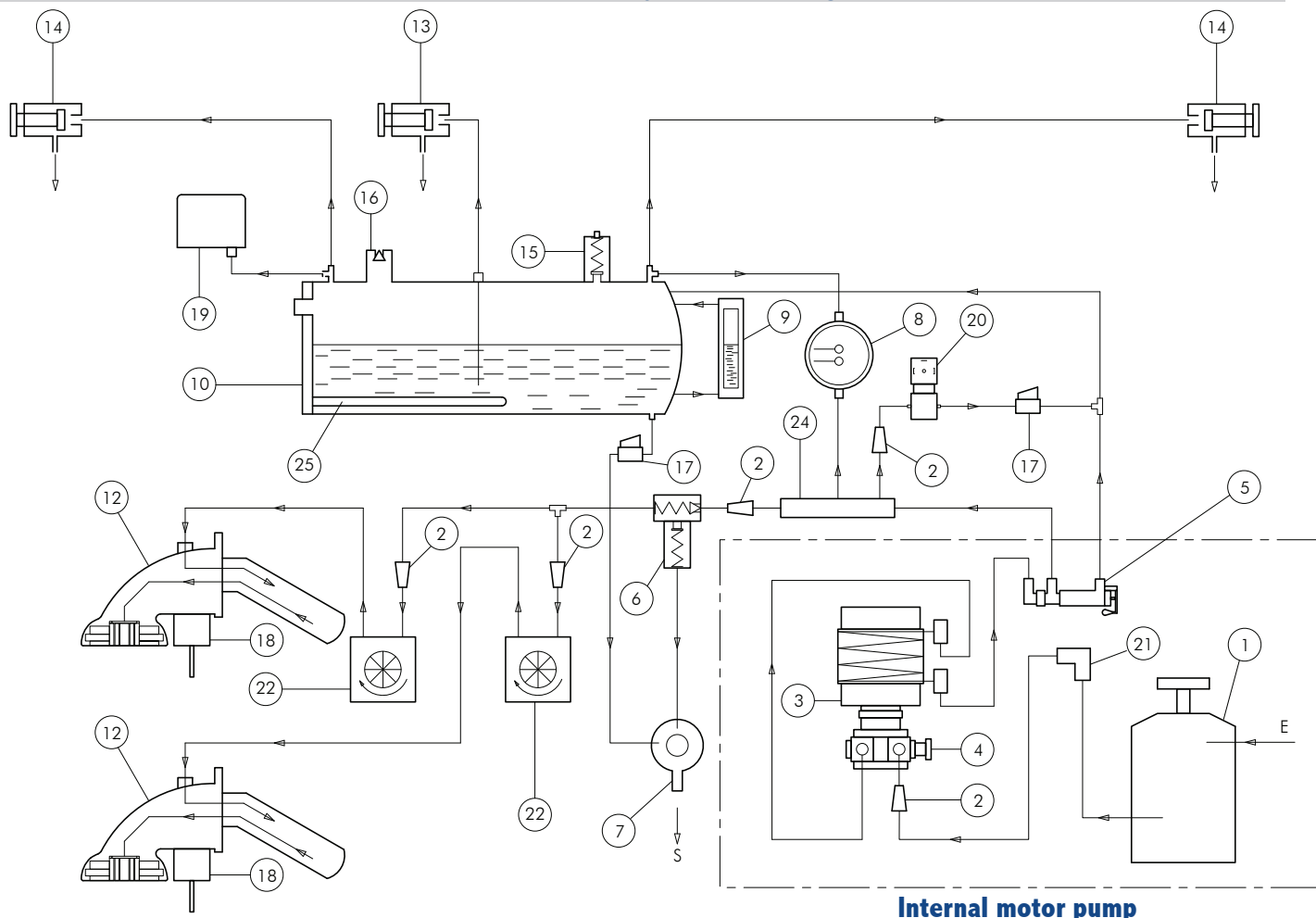


**External motor pump**

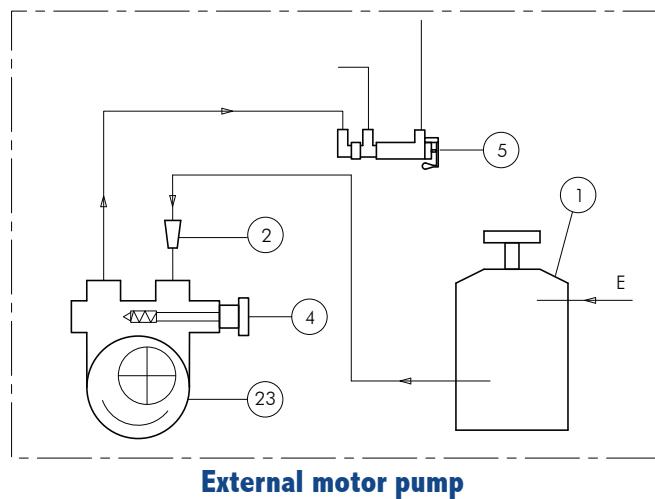
- 1 Water softener
- 2 Water inlet filter
- 3 Built-in motor pump
- 4 Pump pressure adjustment
- 5 Manual water entry tap
- 6 SCNR valve
- 7 Drain tub
- 8 Gauge
- 9 Level-check window
- 10 Boiler
- 11 Heat exchanger
- 12 Delivery group
- 13 Hot water tap
- 14 Steam tap
- 15 Safety valve
- 16 Negative 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

**E** Water inlet  
**S** Drain

## 5. SAE-SME EXTRACTABLE EXCHANGER hydraulic diagram

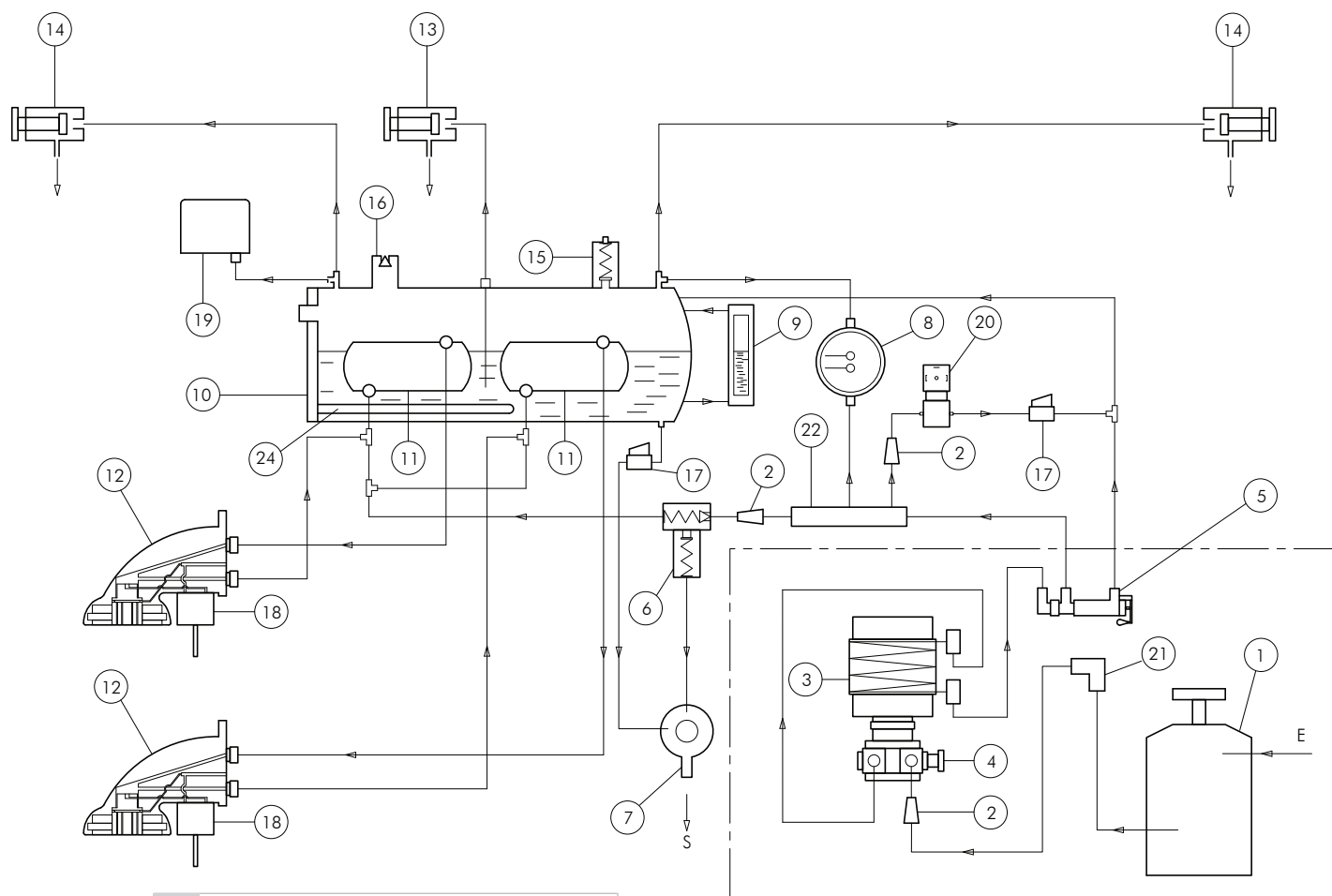


- 1** Water softener
- 2** Water inlet filter
- 3** Built-in motor pump
- 4** Pump pressure adjustment
- 5** Manual water entry tap
- 6** SCNR valve
- 7** Drain tub
- 8** Gauge
- 9** Level-check window
- 10** Boiler
- 11** Heat exchanger
- 12** Delivery group
- 13** Hot water tap
- 14** Steam tap
- 15** 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



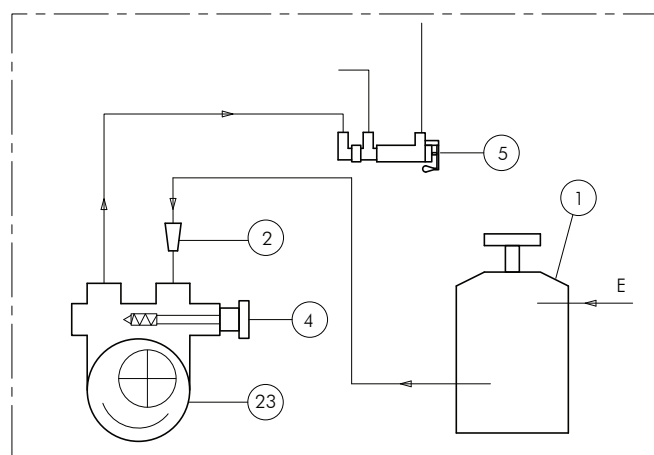
**E** Water inlet  
**S** Drain

## 6. AEP-SMSA 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 Water distributor
- 23 External motor pump
- 24 Boiler heating element

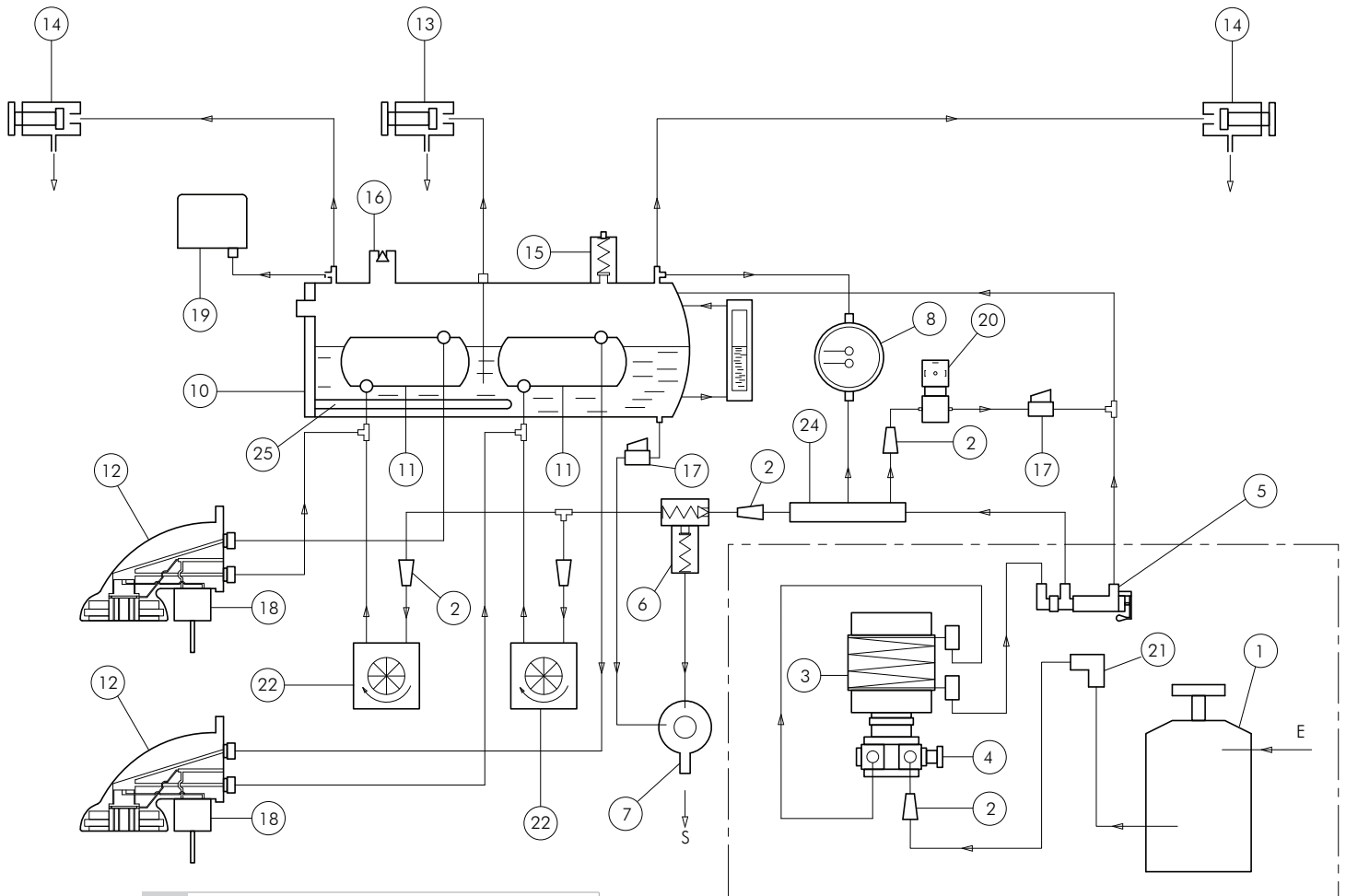
**Internal motor pump**



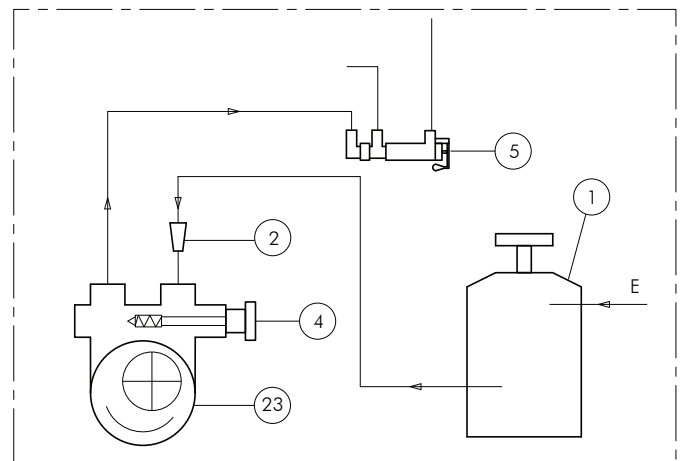
**External motor pump**

**E** Water inlet  
**S** Drain

## 7. SAE-SME CTS system hydraulic diagram



**Internal motor pump**

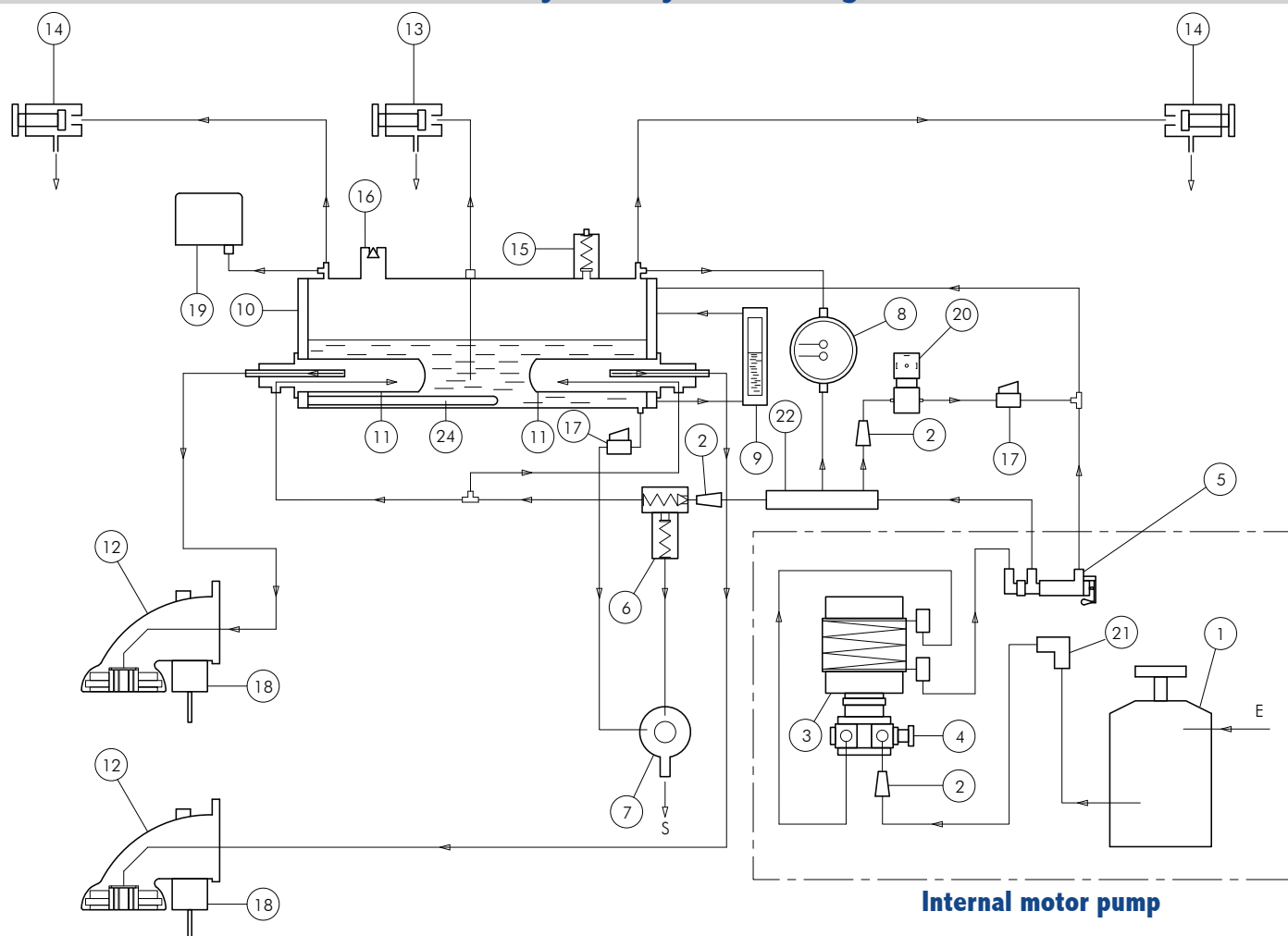


**External motor pump**

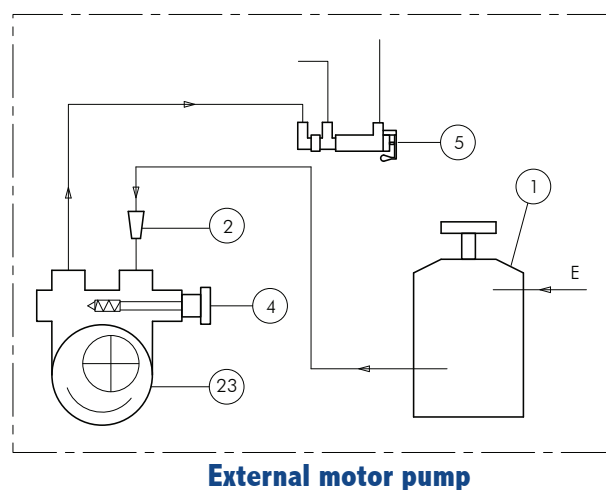
- 1** Water softener
- 2** Water inlet filter
- 3** Built-in motor pump
- 4** Pump pressure adjustment
- 5** Manual water entry tap
- 6** SCNR valve
- 7** Drain tub
- 8** Gauge
- 9** Level-check window
- 10** Boiler
- 11** Heat exchanger
- 12** Delivery group
- 13** Hot water tap
- 14** Steam tap
- 15** 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** Volumetric dosing device
- 23** External motor pump
- 24** Water distributor
- 25** Boiler heating element

**E** Water inlet  
**S** Drain

## 8. AEP-SMSA BOOSTED SYSTEM system hydraulic diagram

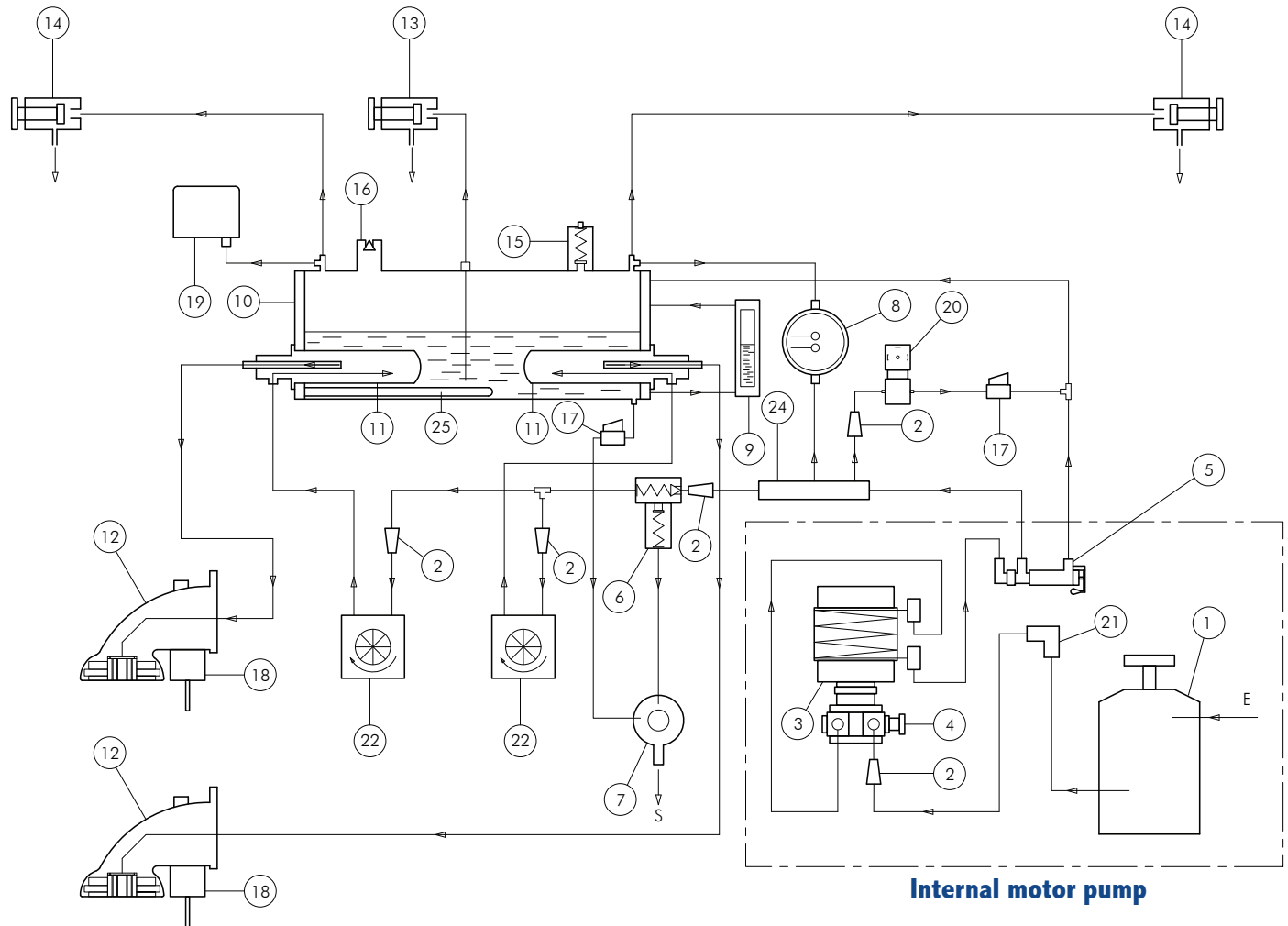


- 1 Water softener
- 2 Water inlet filter
- 3 Built-in motor pump
- 4 Pump pressure adjustment
- 5 Manual water entry tap
- 6 SCNR valve
- 7 Drain tub
- 8 Gauge
- 9 Level-check window
- 10 Boiler
- 11 Heat exchanger
- 12 Delivery group
- 13 Hot water tap
- 14 Steam tap
- 15 Safety valve
- 16 Negative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

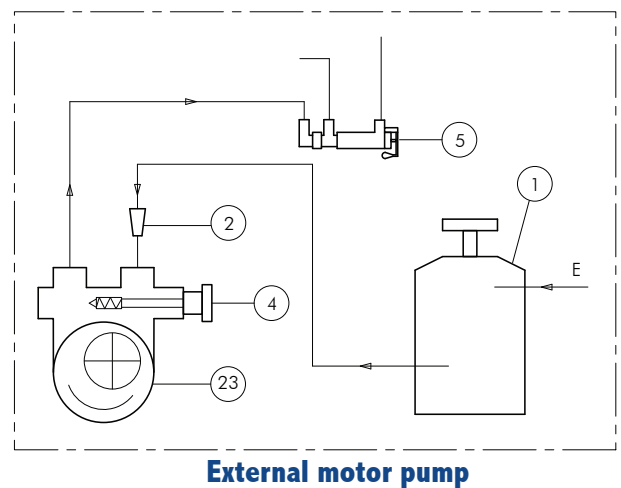


**E** Water inlet  
**S** Drain

## 9. SAE-SME BOOSTED SYSTEM hydraulic diagram



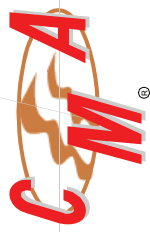
- 1** Water softener
- 2** Water inlet filter
- 3** Built-in motor pump
- 4** Pump pressure adjustment
- 5** Manual water entry tap
- 6** SCNR valve
- 7** Drain tub
- 8** Gauge
- 9** Level-check window
- 10** Boiler
- 11** Heat exchanger
- 12** Delivery group
- 13** Hot water tap
- 14** Steam tap
- 15** 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



**E** Water inlet  
**S** Drain







# ESPRESSO COFFEE MACHINE

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## USE AND MAINTENANCE MANUAL

Instructions for the user

## ELECTRICAL DIAGRAMS

# ENGLISH

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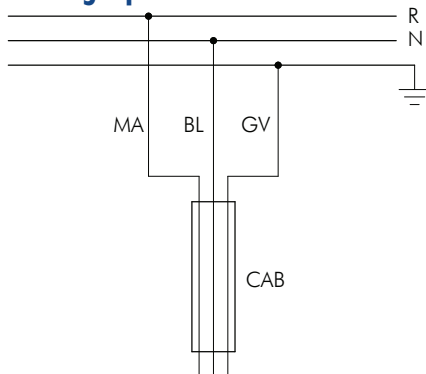


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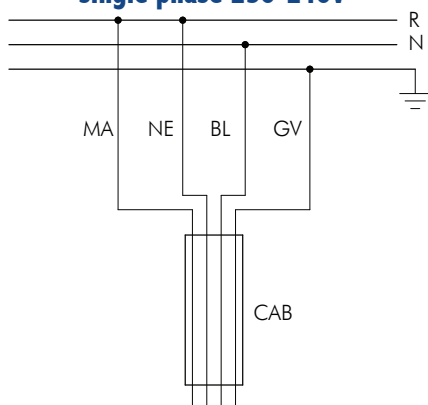
## 1. Electrical diagram ELECTRICAL MAINS CONNECTION

### single phase 120-230-240V

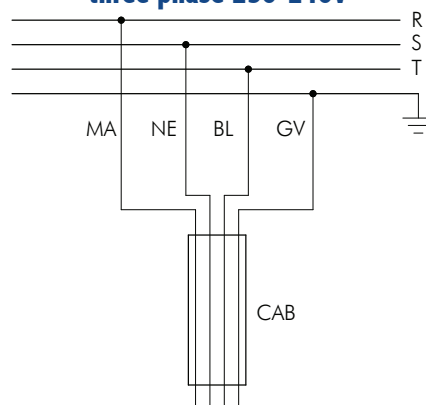


### 3-conductor cable

### single phase 230-240V

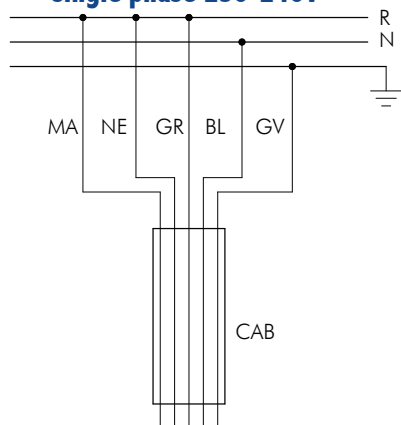


### three phase 230-240V

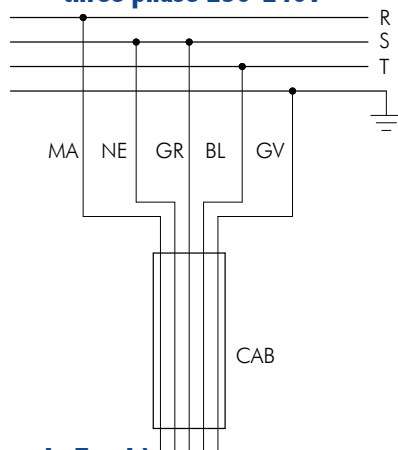


### 4-conductor cable

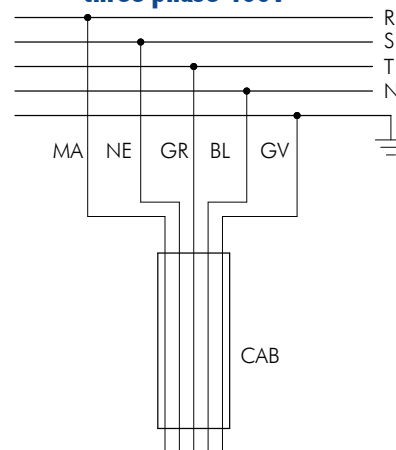
### single phase 230-240V




### three phase 230-240V



### three phase 400V

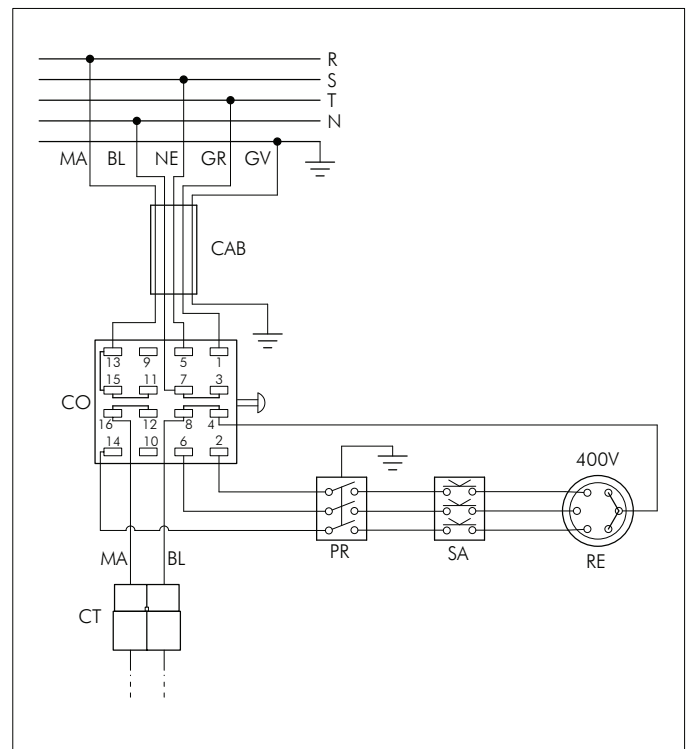
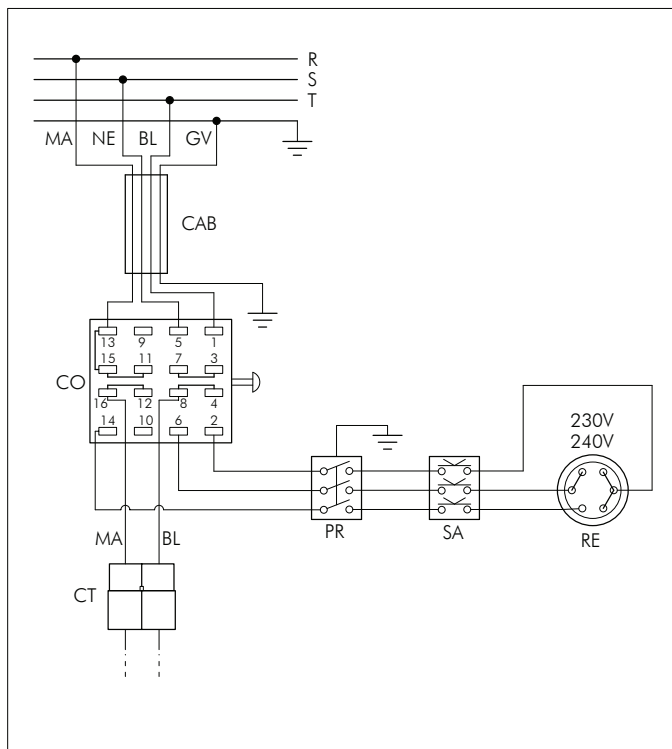
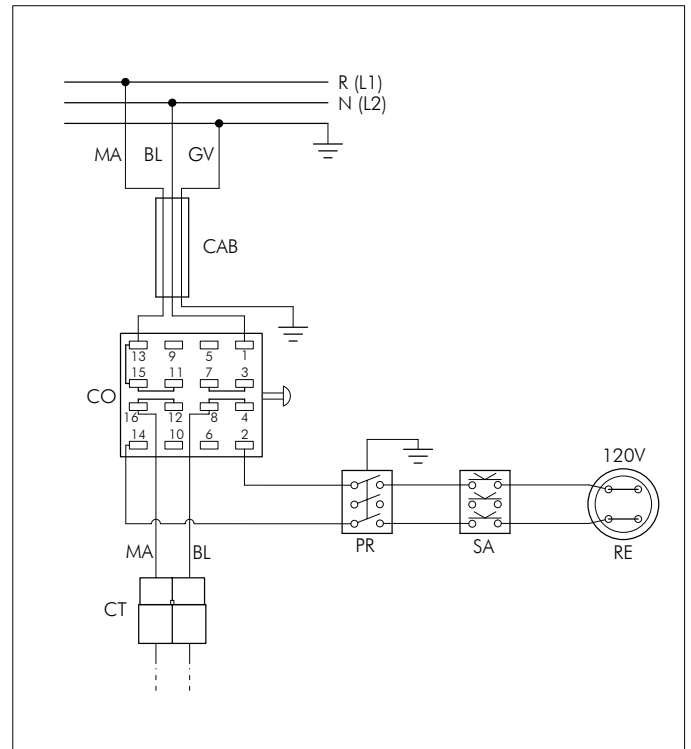
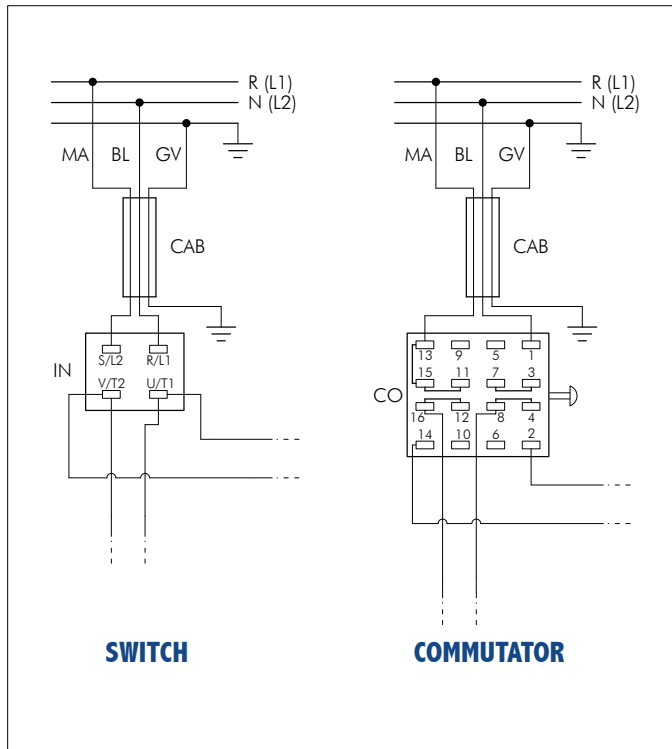



### 5-conductor cable (Three phase+Neutral+Earth)

<b>R</b>	Phase
<b>S</b>	Phase
<b>T</b>	Phase
<b>N</b>	Neutral
	Earth

<b>BL</b>	Blue
<b>CAB</b>	Machine cable
<b>GV</b>	Yellow-green
<b>GR</b>	Grey
<b>MA</b>	Brown
<b>NE</b>	Black

## 2. Electrical diagram MACHINE POWER SUPPLY

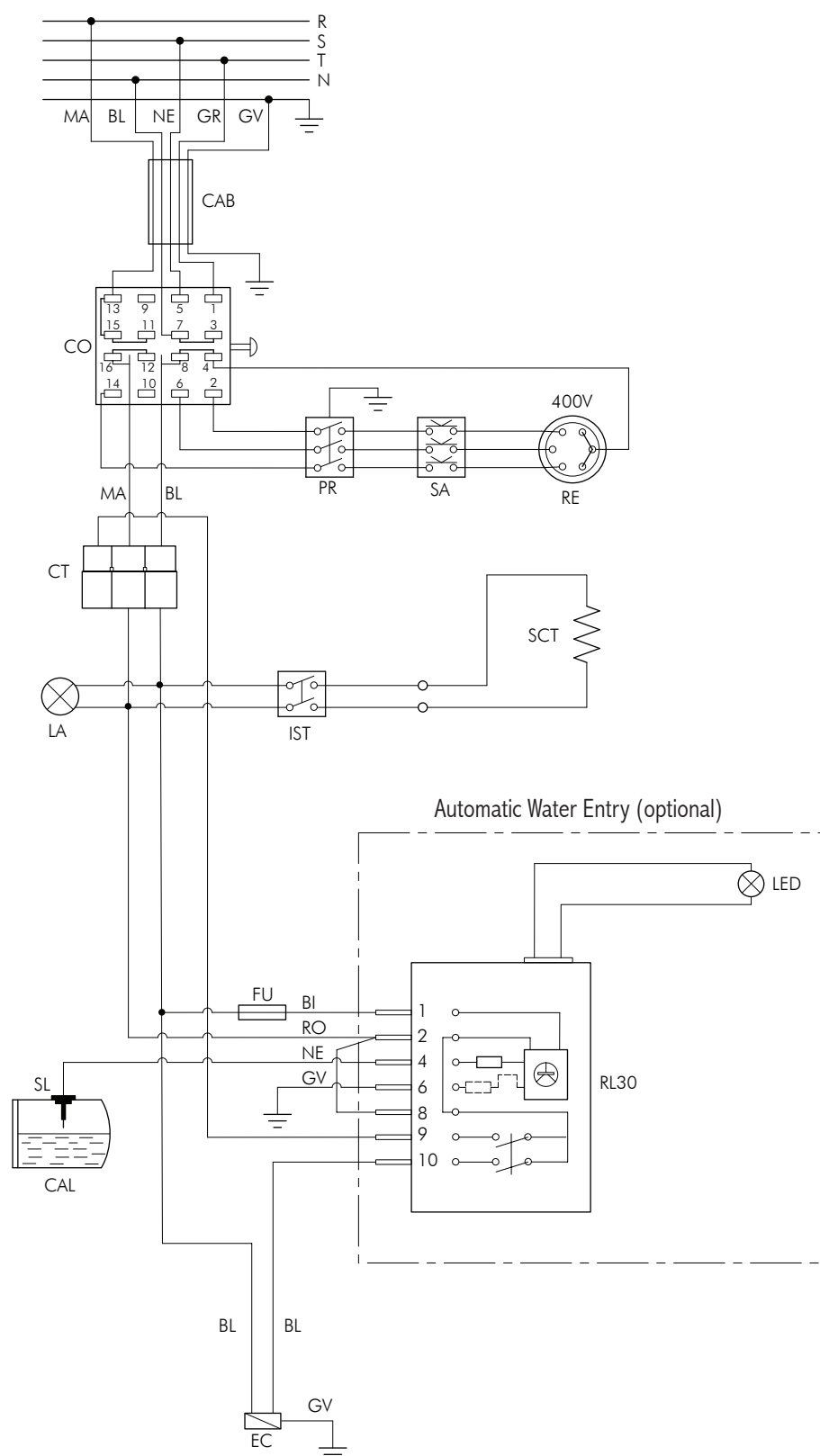


<b>R</b>	Phase
<b>S</b>	Phase
<b>T</b>	Phase
<b>N</b>	Neutral
	Earth

<b>CAB</b>	Machine cable
<b>CT</b>	Power supply connector
<b>CO</b>	Commutator
<b>IN</b>	Switch
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection

<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black

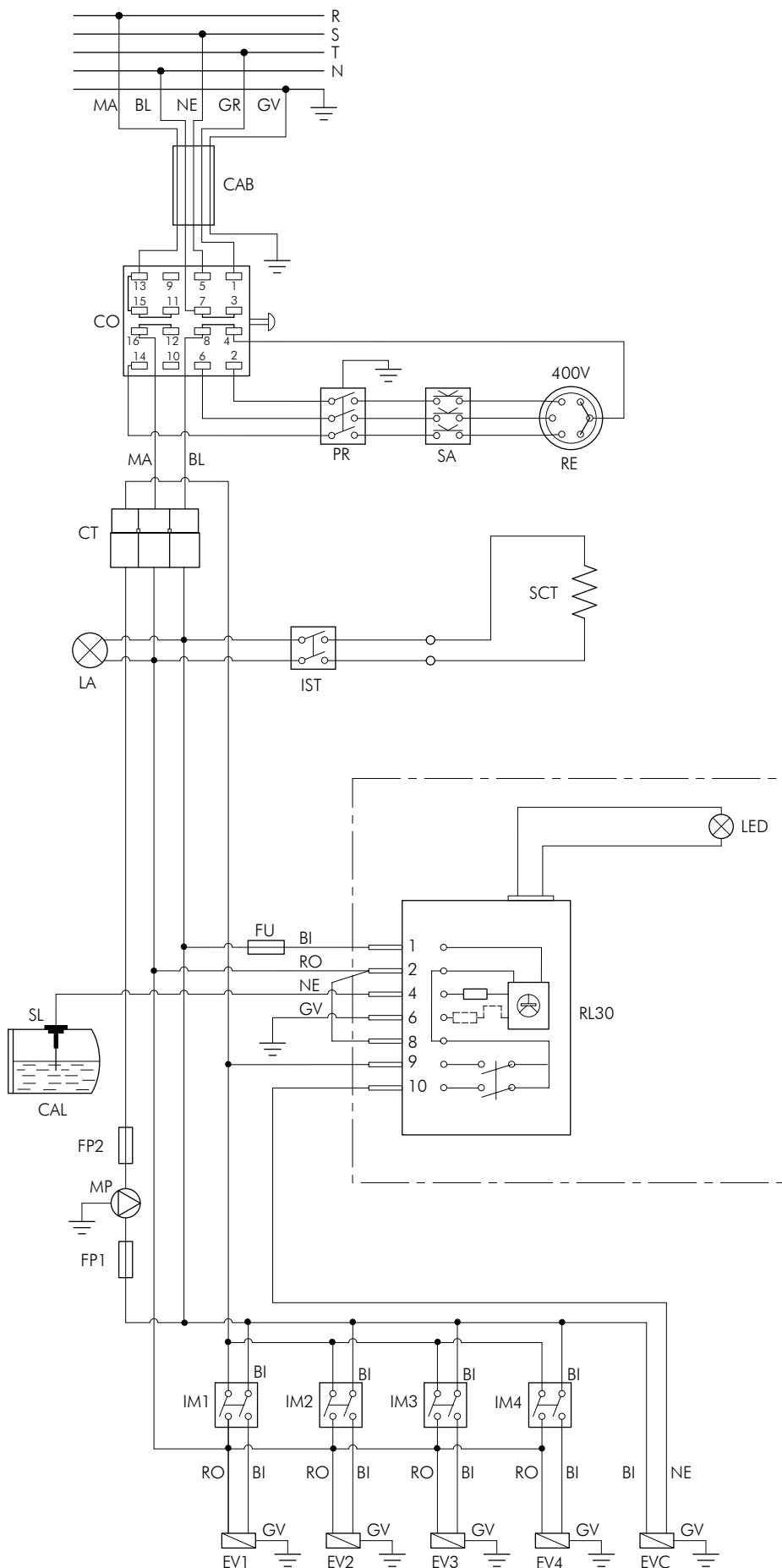
### 3. Electrical diagram version AL-SMMA with automatic water inlet



<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>EC</b>	Boiler filling solenoid valve
<b>FU</b>	Fuse
<b>LED</b>	Time limit LED
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>RL30</b>	Electronic control unit (optional)
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe

#### 4. Electrical diagram version AEP-SMSA

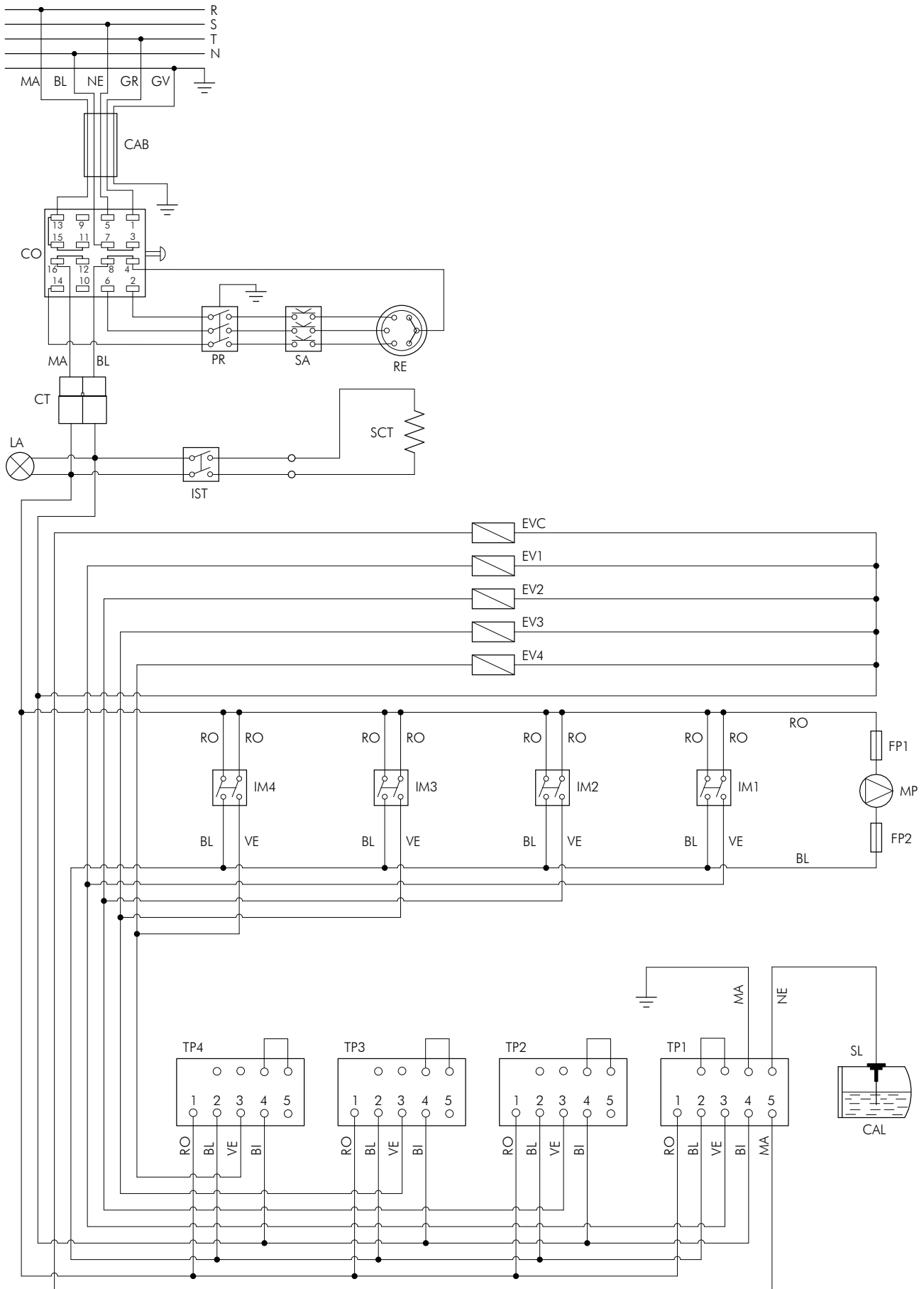


<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EV4</b>	GR4 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>FP1</b>	Motor pump fuse UL (OPD)
<b>FP2</b>	Fuse UL (OPD) for 230V
<b>FU</b>	Fuse
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IM4</b>	GR4 delivery switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>LED</b>	Time limit LED
<b>MP</b>	Motor pump
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>RL30</b>	Electronic control unit (optional)
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe

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

## 5. Electrical diagram version AEAP-SMAT





<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EV4</b>	GR4 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
(*) <b>FP1</b>	Motor pump fuse UL (OPD)
(*) <b>FP2</b>	Fuse UL (OPD) for 230V
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IM4</b>	GR4 delivery switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MP</b>	Motor pump
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe
<b>TP1</b>	GR1 timer
<b>TP2</b>	GR2 timer
<b>TP3</b>	GR3 timer
<b>TP4</b>	GR4 timer

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



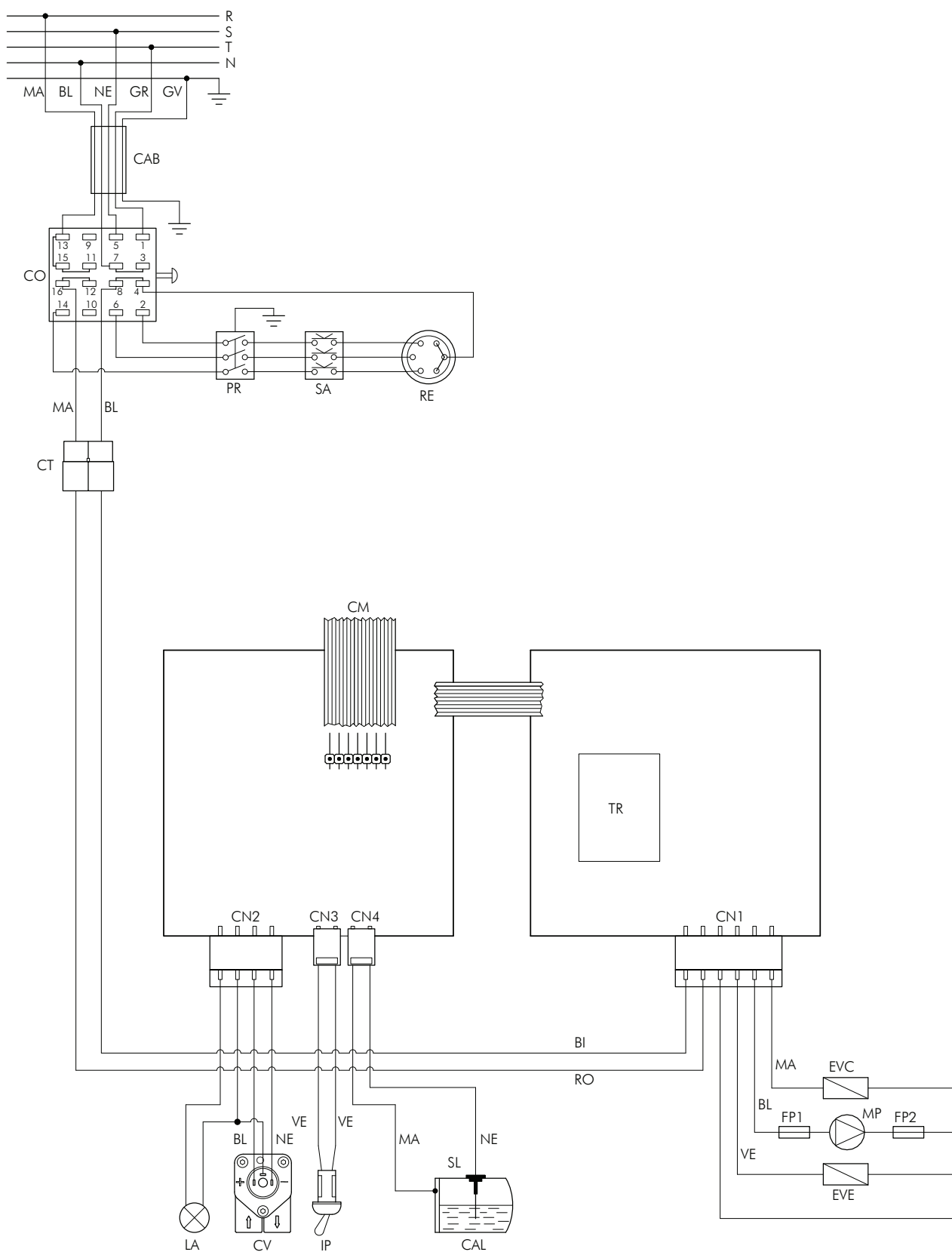
## 6. Electrical diagrams version SAE-SME

The table below shows, for each model of machine, the code for the control unit and the reference for the electrical diagram which can be consulted on the following pages.

MACHINE MODEL		CODE CONTROL UNIT	diagram	
			GIEMME	GICAR
ADRIA	1-2-3GR 220V	18079	page 74	
	1-2-3GR 230V	18090016	page 76	page 78
	1-2-3GR 120V	18090030	page 80	page 82
	1-2-3GR 230-240V	18090031	page 80	page 82
ARGENTA (4 doses)	JUN 110V	18366	page 68	
	JUN 220V	18365	page 68	
	1-2-3GR 110V	18078	page 74	
	1-2-3GR 220V	18079	page 74	
	4GR 220V	18077	page 74	
BRAVA	1-2-3GR 120V	18090017	page 76	page 78
	1-2-3GR 230V	18090016	page 76	page 78
	4GR 230V	18090028	page 76	page 78
CALYPSO	1-2-3GR 120V	18090030	page 80	page 82
	1-2-3GR 230-240V	18090031	page 80	page 82
CALYPSO Display	1-2-3-4GR 120V	18090079	page 88	
	1-2-3-4GR 230V	18090080	page 88	
DENISE (4 doses)	1-2-3GR 110V	18078	page 74	
	1-2-3GR 220V	18079	page 74	
	4GR 220V	18077	page 74	
DIVINA	JUN 120V	18371011	page 70	
	JUN 230V	18371010	page 70	
	1-2-3 GR 120V	18090017	page 76	page 78
	1-2-3 GR 230V	18090016	page 76	page 78
	4GR 120V	18090029	page 76	page 78
	4GR 230V	18090028	page 76	page 78
DORA (4 doses)	JUN 110V	18366	page 68	
	JUN 220V	18365	page 68	
	1-2-3GR 220V	18079	page 74	
GLORIA	1-2-3GR 120V	18090047	page 84	page 86
	1-2-3GR 230V	18090048	page 84	page 86
GLORIA Display Autosteamer	1-2-3-4GR 120V	18090079	page 88	
	1-2-3-4GR 230V	18090080	page 88	
GLORIA LCL	1-2-3GR 120V	18090051	page 90	
	1-2-3GR 230V	18090052	page 90	

MACHINE MODEL		CODE CONTROL UNIT	diagram	
			GIEMME	GICAR
LISA (4 doses)	JUN 110V	18366	page 68	
	JUN 220V	18365	page 68	
	1-2-3GR 110V	18078	page 74	
	1-2-3GR 220V	18079	page 74	
	4GR 220V	18077	page 74	
LISA R	1-2-3GR 120V	18090047	page 84	page 86
	1-2-3GR 230V	18090048	page 84	page 86
LISA R Display Autosteamer	1-2-3-4GR 120V	18090079	page 88	
	1-2-3-4GR 230V	18090080	page 88	
LISA R LCL	1-2-3GR 120V	18090051	page 90	
	1-2-3GR 230V	18090052	page 90	
PERLA	JUN 110V	18090065	page 72	
	JUN 220V	18090066	page 72	
	1-2-3GR 120V	18090047	page 84	page 86
	1-2-3GR 230V	18090048	page 84	page 86
PERLA Display Autosteamer	1-2-3-4GR 120V	18090079	page 88	
	1-2-3-4GR 230V	18090080	page 88	
PERLA LCL	1-2-3GR 120V	18090051	page 90	
	1-2-3GR 230V	18090052	page 90	
PRATIC	1-2-3GR 120V RL3	18090030	page 80	page 82
	1-2-3GR 230-240V RL3	18090031	page 80	page 82
SETTANTA	1-2-3GR 120V	18090047	page 84	page 86
	1-2-3GR 230V	18090048	page 84	page 86
SETTANTA Display Autosteamer	1-2-3-4GR 120V	18090079	page 88	
	1-2-3-4GR 230V	18090080	page 88	
SETTANTA LCL	1-2-3GR 120V	18090051	page 90	
	1-2-3GR 230V	18090052	page 90	
SIBILLA	1-2-3GR 120V	18090047	page 84	page 86
	1-2-3GR 230V	18090048	page 84	page 86
SIBILLA Display	1-2-3-4GR 120V	18090079	page 88	
	1-2-3-4GR 230V	18090080	page 88	
VANIA	JUN 120V	18371011	page 70	
	JUN 230V	18371010	page 70	
	1-2-3GR 120V	18090017	page 76	page 78
	1-2-3GR 230V	18090016	page 76	page 78

## 6.01 Electrical diagram code 18365-18366 \*JUNIOR\*

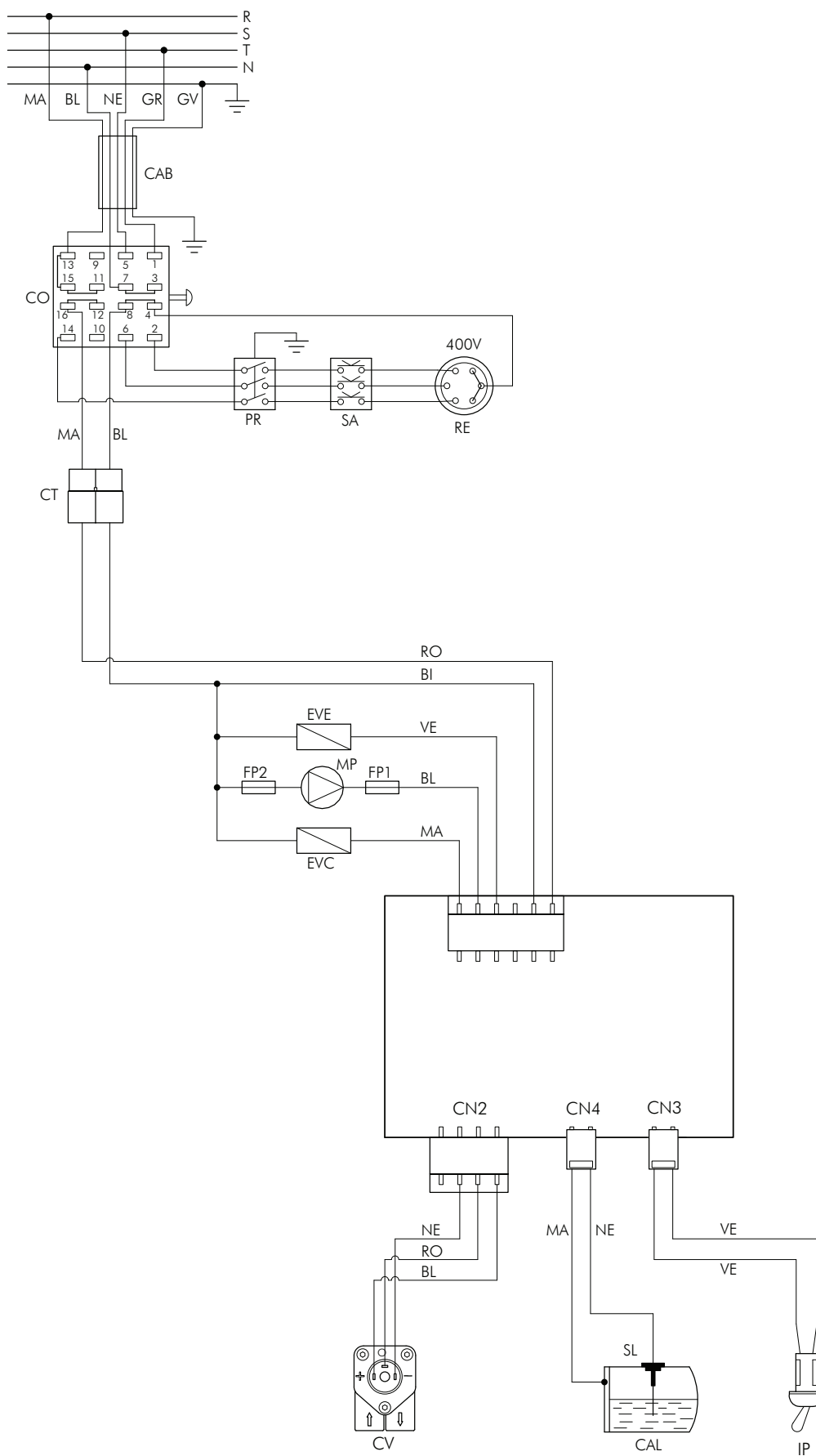


<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CM</b>	Membrane connection
<b>CN1</b>	Power supply-services outputs
<b>CN2</b>	Dosing device output
<b>CN3</b>	Programming switch
<b>CN4</b>	Boiler level
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV</b>	Volumetric counter
<b>EVC</b>	Boiler filling solenoid valve
<b>EVE</b>	Delivery solenoid valve
(*) <b>FP1</b>	Motor pump fuse UL (OPD)
(*) <b>FP2</b>	Fuse UL (OPD) for 230V
<b>IP</b>	Programming switch
<b>LA</b>	Indicator light
<b>MP</b>	Motor pump
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe
<b>TR</b>	Transformer

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

## 6.02 Electrical diagram code 18371010-18371011 \*JUNIOR\*

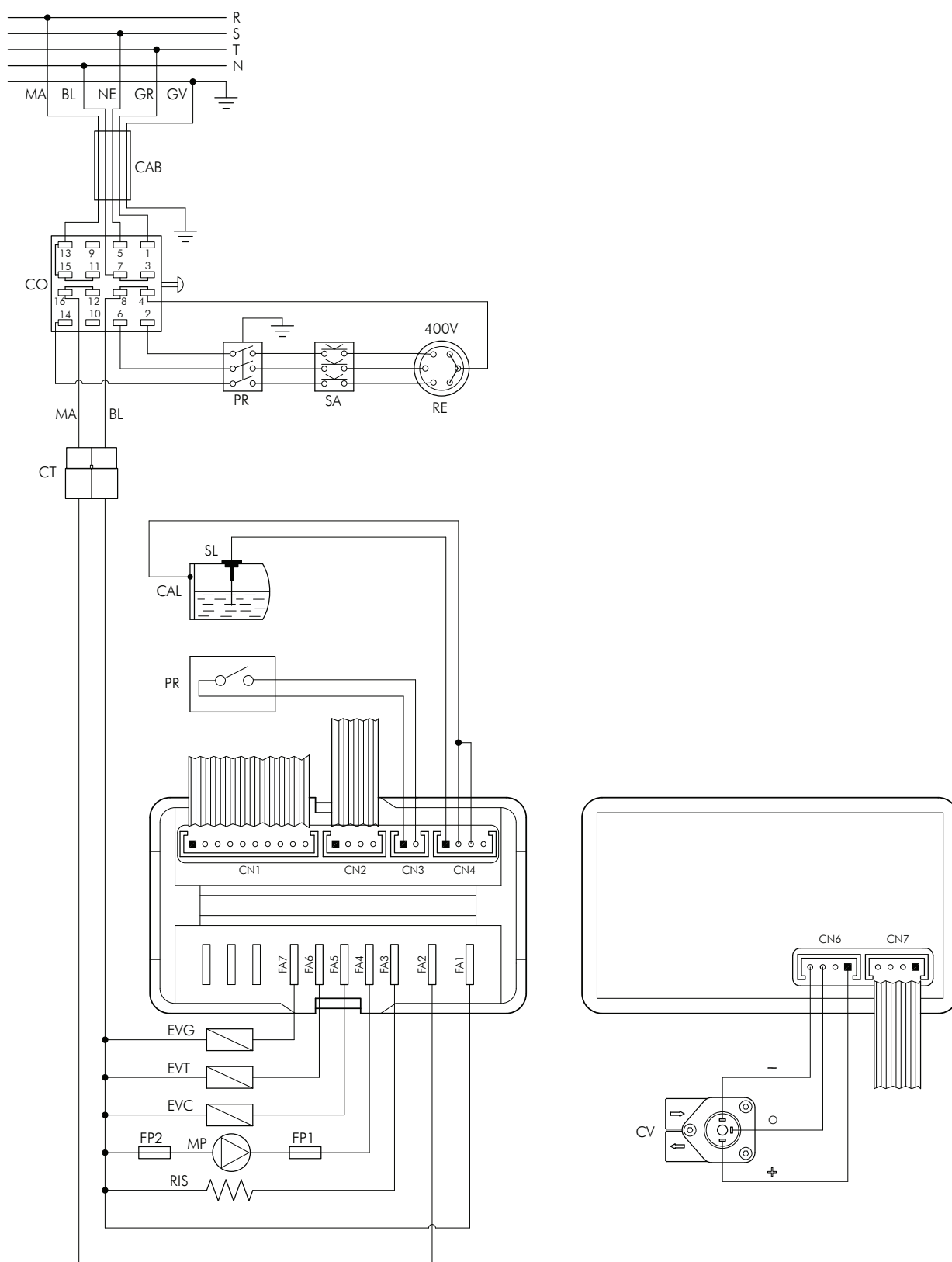


<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN1</b>	Power supply-services outputs
<b>CN2</b>	Dosing device output
<b>CN3</b>	Programming switch
<b>CN4</b>	Boiler level
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV</b>	Volumetric counter
<b>EVC</b>	Boiler filling solenoid valve
<b>EVE</b>	Delivery solenoid valve
(*) <b>FP1</b>	Motor pump fuse UL (OPD)
(*) <b>FP2</b>	Fuse UL (OPD) for 230V
<b>IP</b>	Programming switch
<b>LA</b>	Indicator light
<b>MP</b>	Motor pump
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe

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

## 6.03 Electrical diagram code 18090065-18090066 \*JUNIOR\*



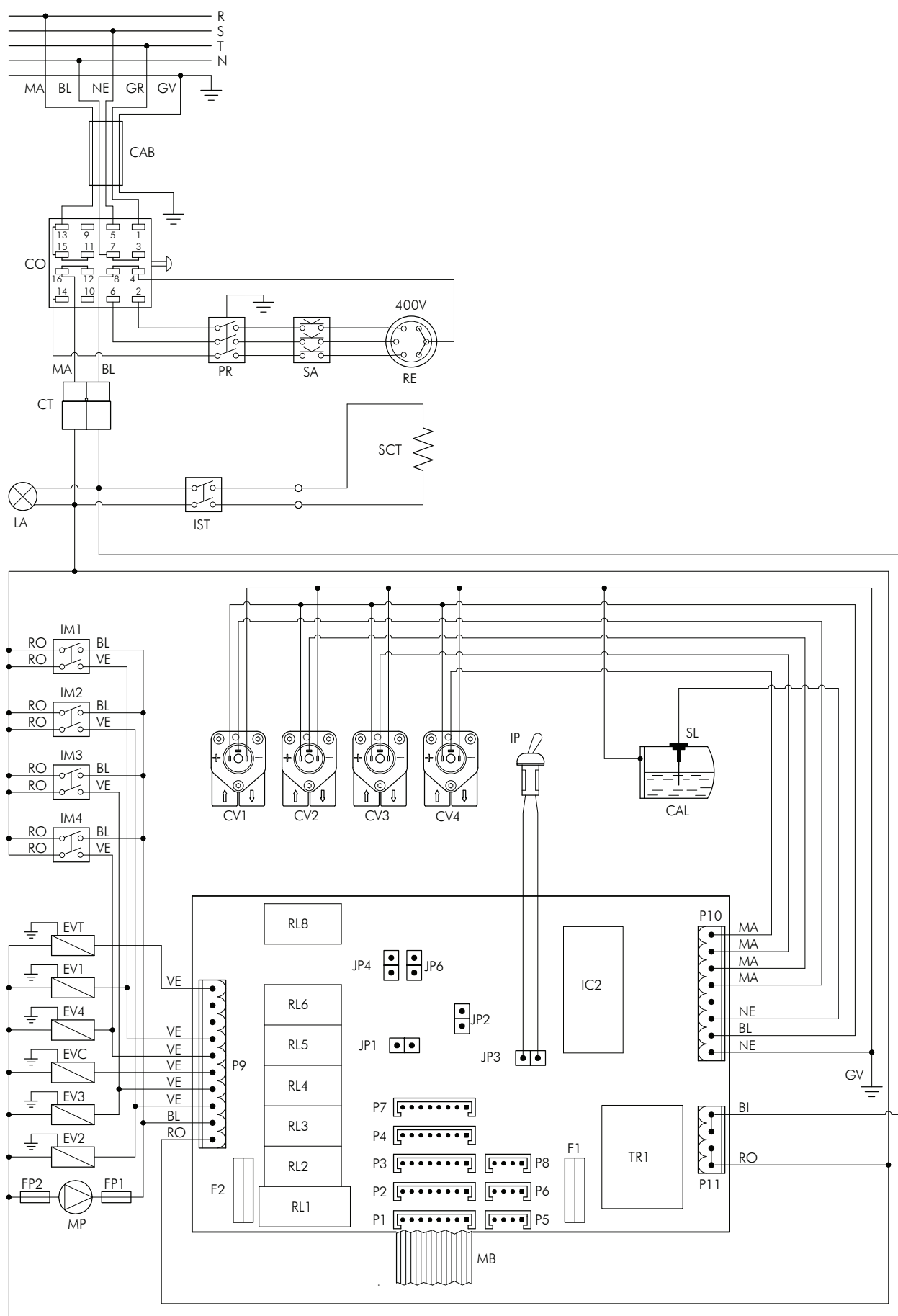


<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN1</b>	Push button connection
<b>CN2</b>	Tea dose connection
<b>CN3</b>	Pressure switch connection
<b>CN4</b>	Level probe connection
<b>CN6</b>	Volumetric counter connection
<b>CN7</b>	Seriale RS232 connection
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV</b>	Volumetric counter
<b>EVC</b>	Boiler filling solenoid valve
<b>EVG</b>	Group solenoid valve
<b>EVT</b>	Tea solenoid valve
(*) <b>FP1</b>	Motor pump fuse UL (OPD)
(*) <b>FP2</b>	Fuse UL (OPD) for 230V
<b>LA</b>	Indicator light
<b>MP</b>	Motor pump
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>RIS</b>	Heating
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe

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

## 6.04 Electrical diagram code 18077-18078-18079



<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>CV4</b>	GR4 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EV4</b>	GR4 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>IC2</b>	Eprom
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IM4</b>	GR3 delivery switch
<b>IP</b>	Programming switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>P1</b>	Push button GR1 connector
<b>P2</b>	Push button GR2 connector
<b>P3</b>	Push button GR3 connector
<b>P4</b>	Push button GR4 connector
<b>P5</b>	Tea dose connector
<b>P7</b>	Serial connector
<b>P9</b>	Services outputs connector
<b>P10</b>	Low voltage connector
<b>P11</b>	Power supply
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>RL1</b>	Pump relay
<b>RL2</b>	Solenoid valve relay GR2
<b>RL3</b>	Solenoid valve relay GR3
<b>RL4</b>	Boiler solenoid valve relay
<b>RL5</b>	Solenoid valve relay GR4
<b>RL6</b>	Solenoid valve relay GR1
<b>RL8</b>	Tea solenoid valve relay
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe
<b>TR1</b>	Transformer

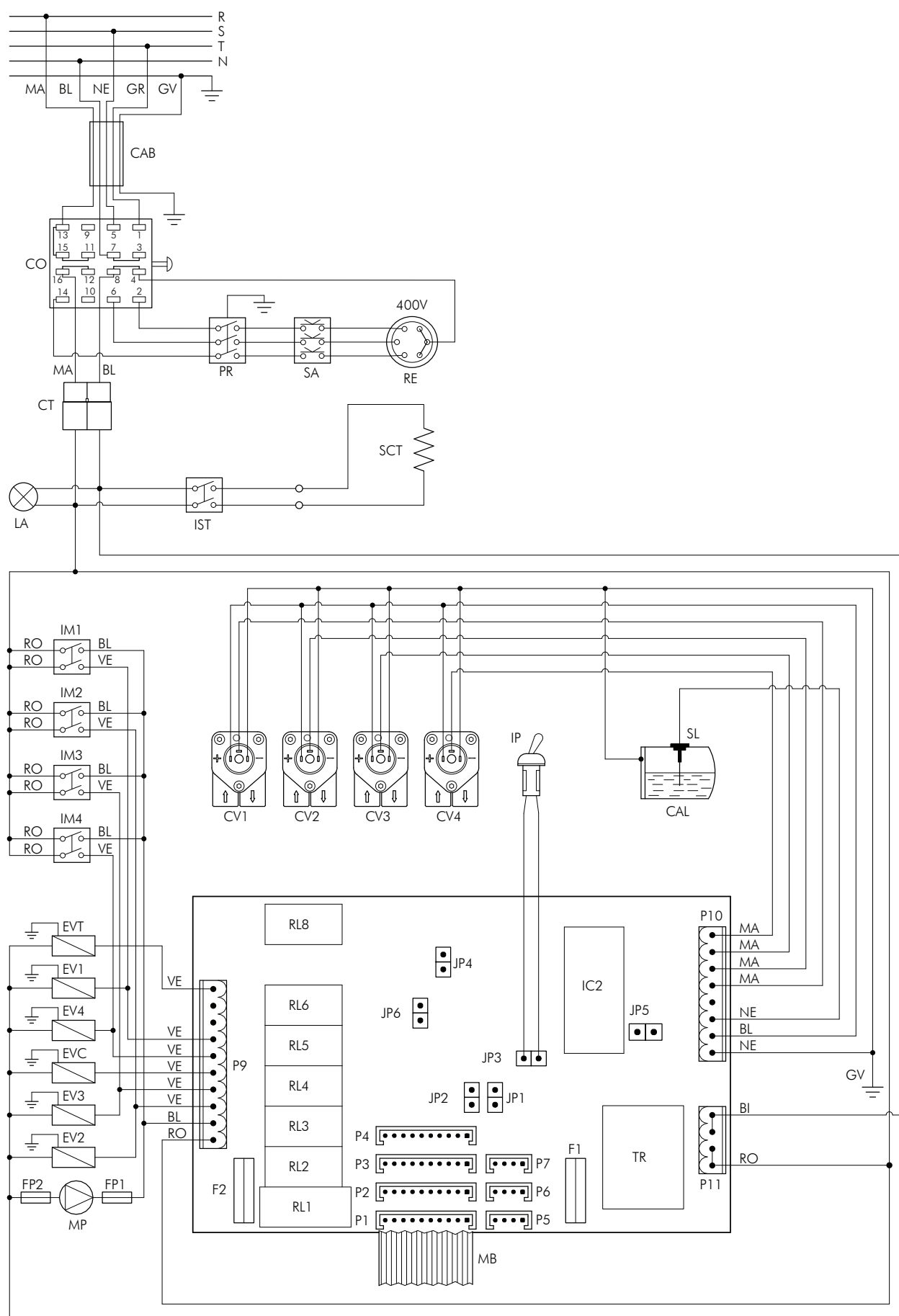
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

JUMPER	INSERTED	NOT INSERTED
<b>JP1</b>	Serial connection enabled	Serial connection disabled
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Programming switch	
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP6</b>	Tea delivery with pump	Tea delivery without pump

**6.05** Electrical diagram code 18090016-18090017-18090028-18090029 \*GIEMME\*



<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>CV4</b>	GR4 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EV4</b>	GR4 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>IC2</b>	Eprom
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IM4</b>	GR3 delivery switch
<b>IP</b>	Programming switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>P1</b>	Push button GR1 connector
<b>P2</b>	Push button GR2 connector
<b>P3</b>	Push button GR3 connector
<b>P4</b>	Push button GR4 connector
<b>P5</b>	Tea dose connector
<b>P6</b>	Not managed
<b>P7</b>	Serial connector
<b>P9</b>	Services outputs connector
<b>P10</b>	Low voltage connector
<b>P11</b>	Power supply
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>RL1</b>	Pump relay
<b>RL2</b>	Solenoid valve relay GR2
<b>RL3</b>	Solenoid valve relay GR3
<b>RL4</b>	Boiler solenoid valve relay
<b>RL5</b>	Solenoid valve relay GR4
<b>RL6</b>	Solenoid valve relay GR1
<b>RL8</b>	Tea solenoid valve relay
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe
<b>TR1</b>	Transformer

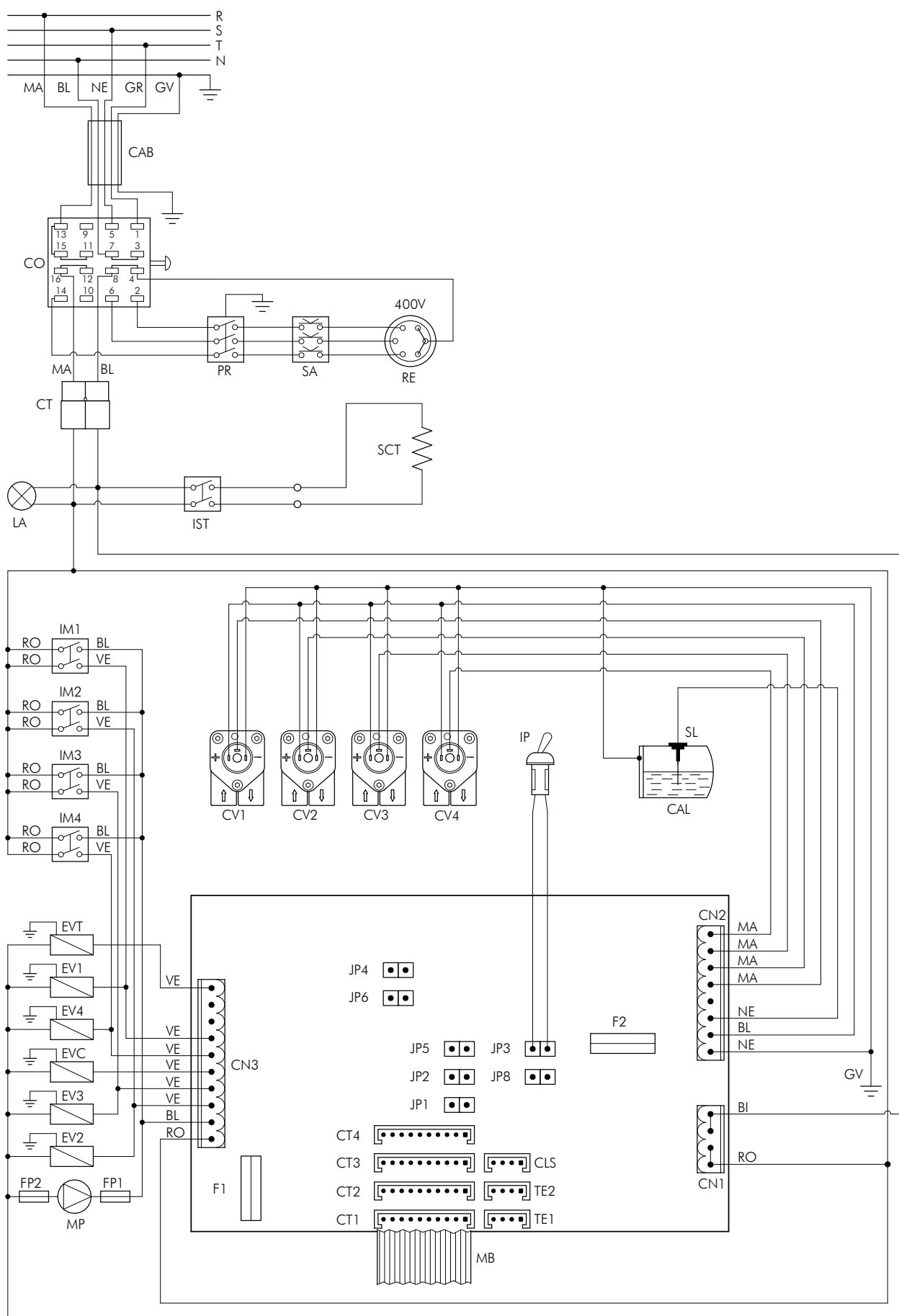
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

JUMPER	INSERTED	NOT INSERTED
<b>JP1</b>	Serial connection enabled	Serial connection disabled
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Programming switch	
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Connection tea button automatic	

**6.06** Electrical diagram code 18090016-17 18090028-29 \*GICAR\*



<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CLS</b>	Serial connector
<b>CN1</b>	Power supply
<b>CN2</b>	Low voltage connector
<b>CN3</b>	Services outputs connector
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CT1</b>	Push button GR1 connector
<b>CT2</b>	Push button GR2 connector
<b>CT3</b>	Push button GR3 connector
<b>CT4</b>	Push button GR4 connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>CV4</b>	GR4 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EV4</b>	GR4 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>IC2</b>	Eprom
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IM4</b>	GR3 delivery switch
<b>IP</b>	Programming switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe
<b>TE1</b>	Tea dose
<b>TE2</b>	Not managed

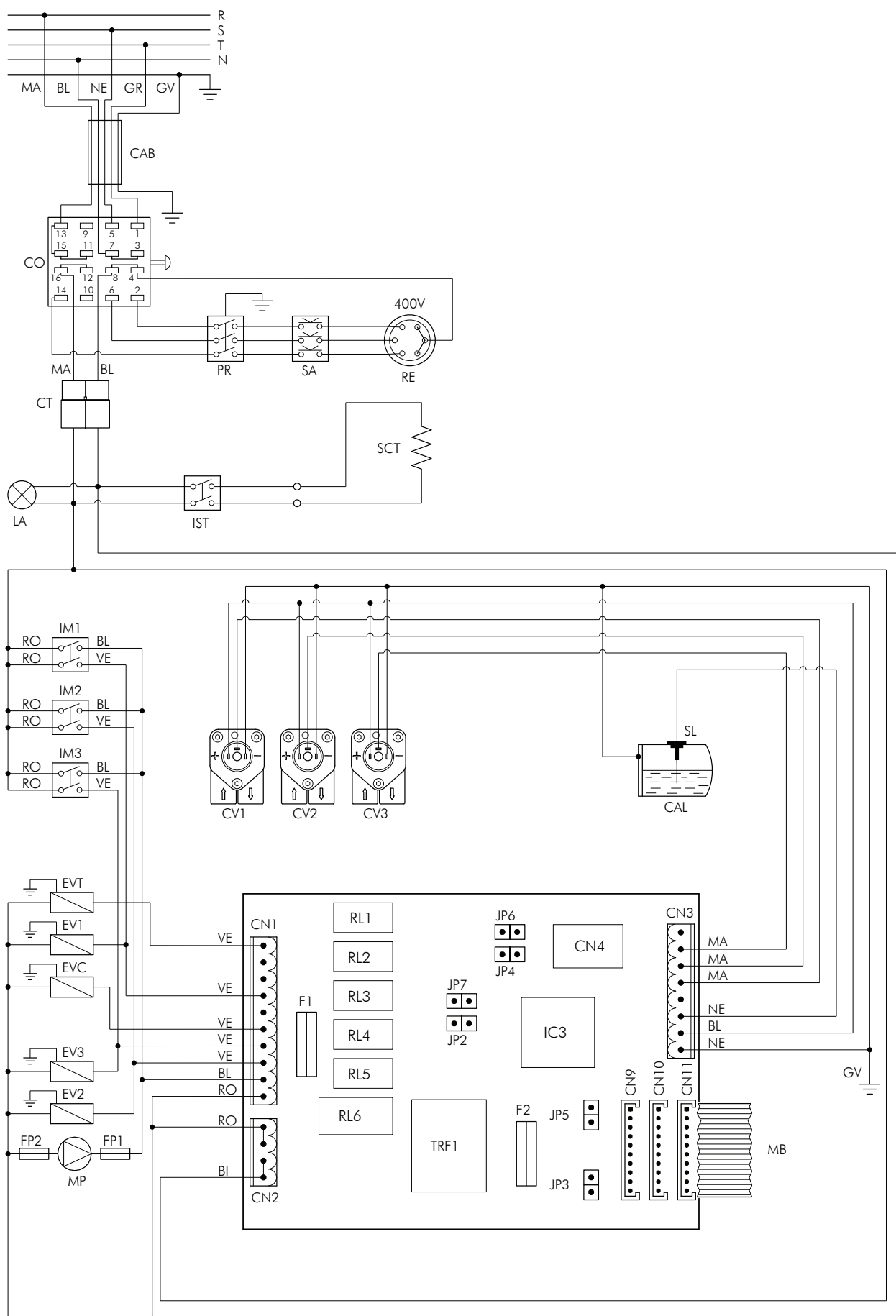
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

<b>JUMPER</b>	<b>INSERTED</b>	<b>NOT INSERTED</b>
<b>JP1</b>	Serial connection enabled	Serial connection disabled
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Dose programming enabled	Dose programming disabled
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Configuration "W"	Configuration "C"
<b>JP6</b>	Tea delivery with pump	Tea delivery with pump
<b>JP8</b>	Control D	I/O Interface

## 6.07 Electrical diagram code 18090030-18090031 \*GIEMME\*





<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN1</b>	Services outputs connector
<b>CN2</b>	Power supply connector
<b>CN3</b>	Low voltage connector
<b>CN4</b>	Programmation connector
<b>CN9</b>	Push button GR3 connector
<b>CN10</b>	Push button GR2 connector
<b>CN11</b>	Push button GR1 connector
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>IC2</b>	Eprom
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>PLT</b>	Tea push button
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>RL1</b>	Tea solenoid valve relay
<b>RL2</b>	Solenoid valve relay GR1
<b>RL3</b>	Boiler solenoid valve relay
<b>RL4</b>	Solenoid valve relay GR3
<b>RL5</b>	Solenoid valve relay GR2
<b>RL6</b>	Pump relay
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe
<b>TRF1</b>	Transformer

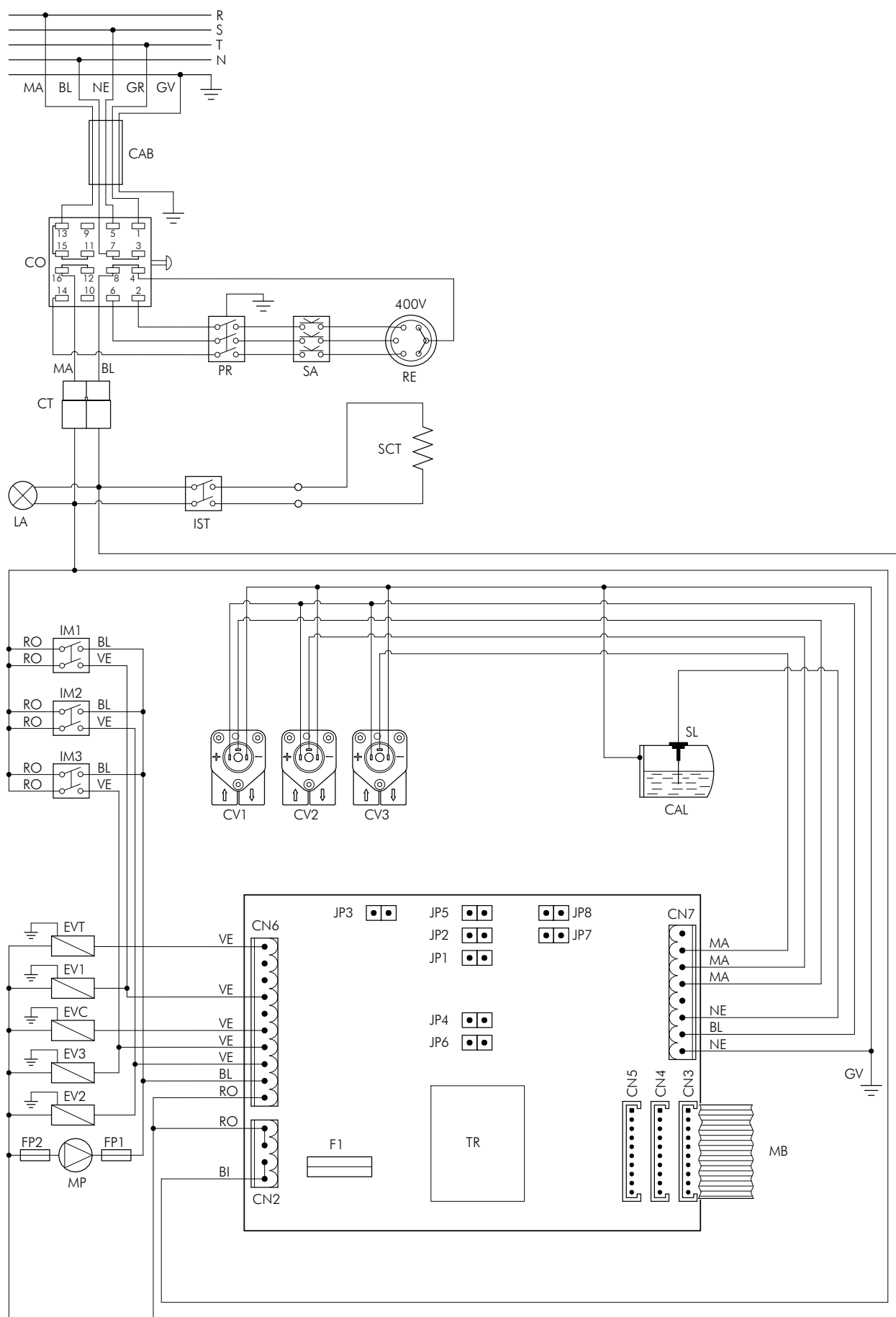
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

<b>JUMPER</b>	<b>INSERTED</b>	<b>NOT INSERTED</b>
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Dose programming enabled	Dose programming disabled
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Tea key enabled	Tea key disabled
<b>JP6</b>	Tea delivery with pump	Tea delivery with pump
<b>JP7</b>	STOP key continuat. disabled	STOP key continuation enabled

## 6.08 Electrical diagram code 18090030-18090031 \*GICAR\*



<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN2</b>	Power supply connector
<b>CN3</b>	Push button GR1 connector
<b>CN4</b>	Push button GR2 connector
<b>CN5</b>	Push button GR3 connector
<b>CN6</b>	Services outputs connector
<b>CN7</b>	Low voltage connector
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SL</b>	Level probe
<b>TR</b>	Transformer

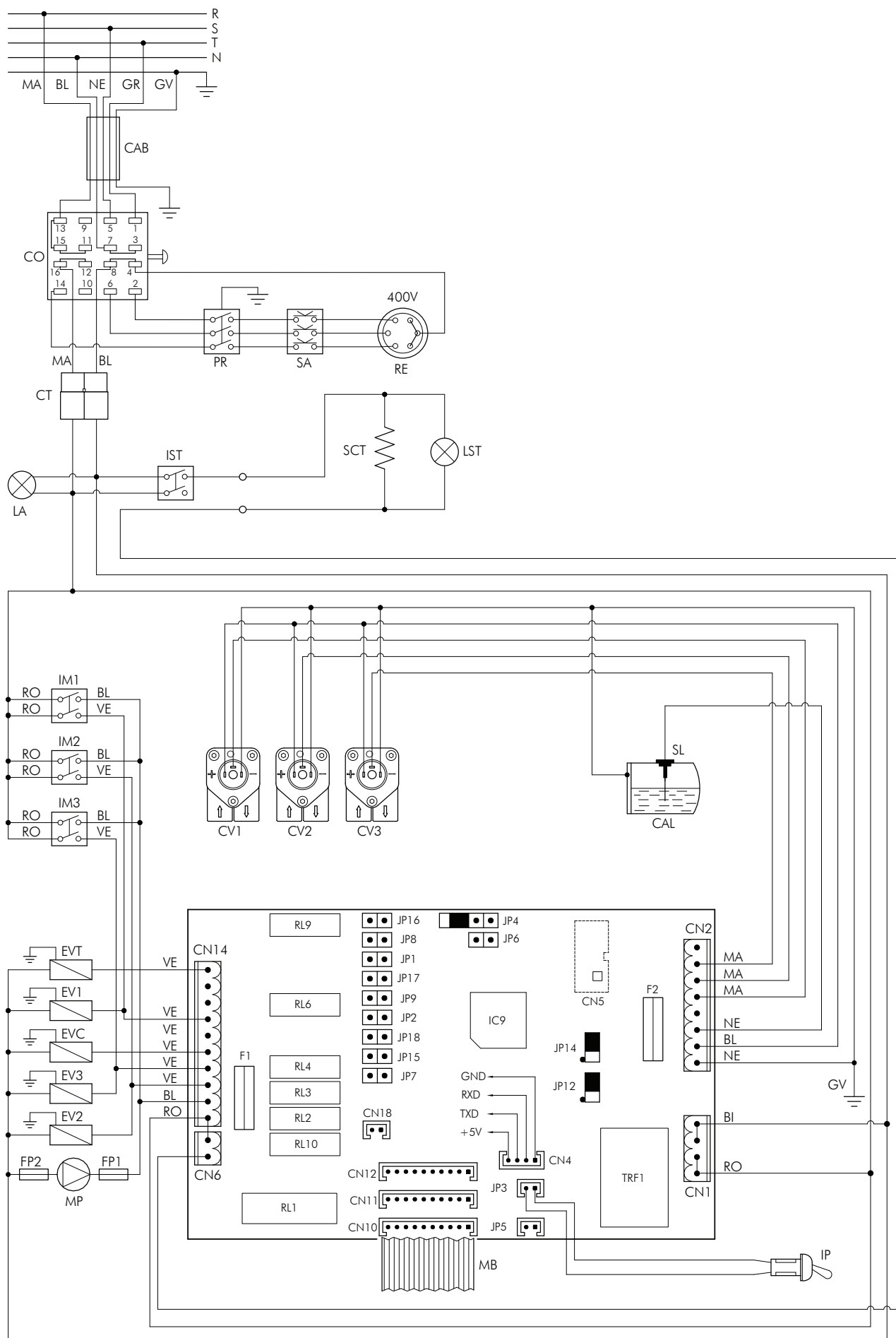
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

	<b>F1</b>	Inlets fuse (6,3A)
(*)	<b>FP1</b>	Motor pump fuse UL (OPD)
(*)	<b>FP2</b>	Fuse UL (OPD) for 230V

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

<b>JUMPER</b>	<b>INSERTED</b>	<b>NOT INSERTED</b>
<b>JP1</b>	Not managed	Not managed
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Dose programming enabled	Dose programming disabled
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Tea key enabled	Tea key disabled
<b>JP6</b>	Tea delivery with pump	Tea delivery with pump
<b>JP7</b>	STOP key continuat. disabled	STOP key continuation enabled
<b>JP8</b>	Not managed	Not managed

## 6.09 Electrical diagram code 18090047-48 \*GIEMME\*



<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN1</b>	Power supply connector
<b>CN2</b>	Low voltage connector
<b>CN4</b>	Serial connector
<b>CN5</b>	Not managed
<b>CN6</b>	Cup heating elem. connector
<b>CN10</b>	Push button GR1 connector
<b>CN11</b>	Push button GR2 connector
<b>CN12</b>	Push button GR3 connector
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>IC2</b>	Microprocessore
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IP</b>	Programming switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>P5</b>	Tea dose
<b>P6</b>	Not managed
<b>P7</b>	Serial connector
<b>P9</b>	Services outputs connector
<b>P10</b>	Low voltage connector
<b>P11</b>	Power supply
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SCT</b>	Cup heating element
<b>SL</b>	Level probe
<b>TRF1</b>	Transformer

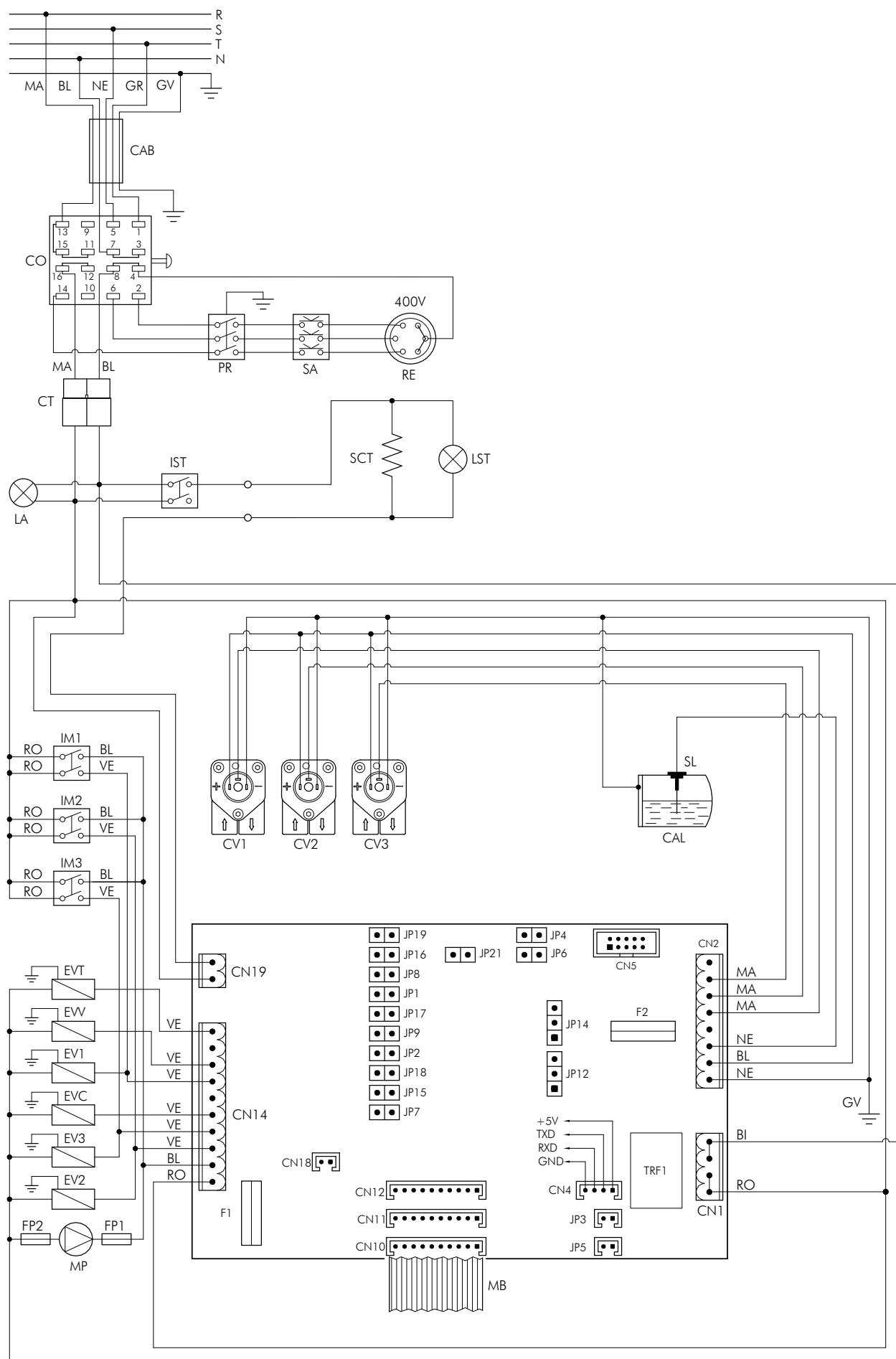
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

<b>JUMPER</b>	<b>INSERTED</b>	<b>NOT INSERTED</b>
<b>JP1</b>	Serial transmission enabled	Serial transmission disabled
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Programming switch connector	
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Tea delivery	
<b>JP6</b>	Tea delivery with pump	Tea delivery with pump
<b>JP7</b>	STOP key continuat. disabled	STOP key continuation enabled
<b>JP8</b>	Dosis check enabled	Dosis check disabled
<b>JP9</b>	Credit/Debit enabled	Credit/Debit disabled
<b>JP15</b>	Display function keys enabled	Display function keys disabled
<b>JP16</b>	6-key dosing enabled	4-key dosing enabled
<b>JP17</b>	Check boiler t° with external pressure (always on)	
<b>JP18</b>	Check boiler temp/press ON (always on)	

## 6.10 Electrical diagram code 18090047-48 \*GICAR\*



<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN1</b>	Power supply connector
<b>CN2</b>	Low voltage connector
<b>CN4</b>	Serial connector
<b>CN5</b>	ON-BOARD programming
<b>CN10</b>	Push button GR1 connector
<b>CN11</b>	Push button GR2 connector
<b>CN12</b>	Push button GR3 connector
<b>CN14</b>	Services outputs connector
<b>CN18</b>	Cup heating NTC connector
<b>CN19</b>	Cup heating connector
<b>CO</b>	Commutator
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>EVV</b>	Steam solenoid valve
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>P5</b>	Tea dose
<b>P6</b>	Not managed
<b>P7</b>	Serial connector
<b>P9</b>	Services outputs connector
<b>P10</b>	Low voltage connector
<b>P11</b>	Power supply
<b>PR</b>	Pressure switch
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SCT</b>	Cup heating element
<b>SL</b>	Level probe
<b>TRF1</b>	Transformer

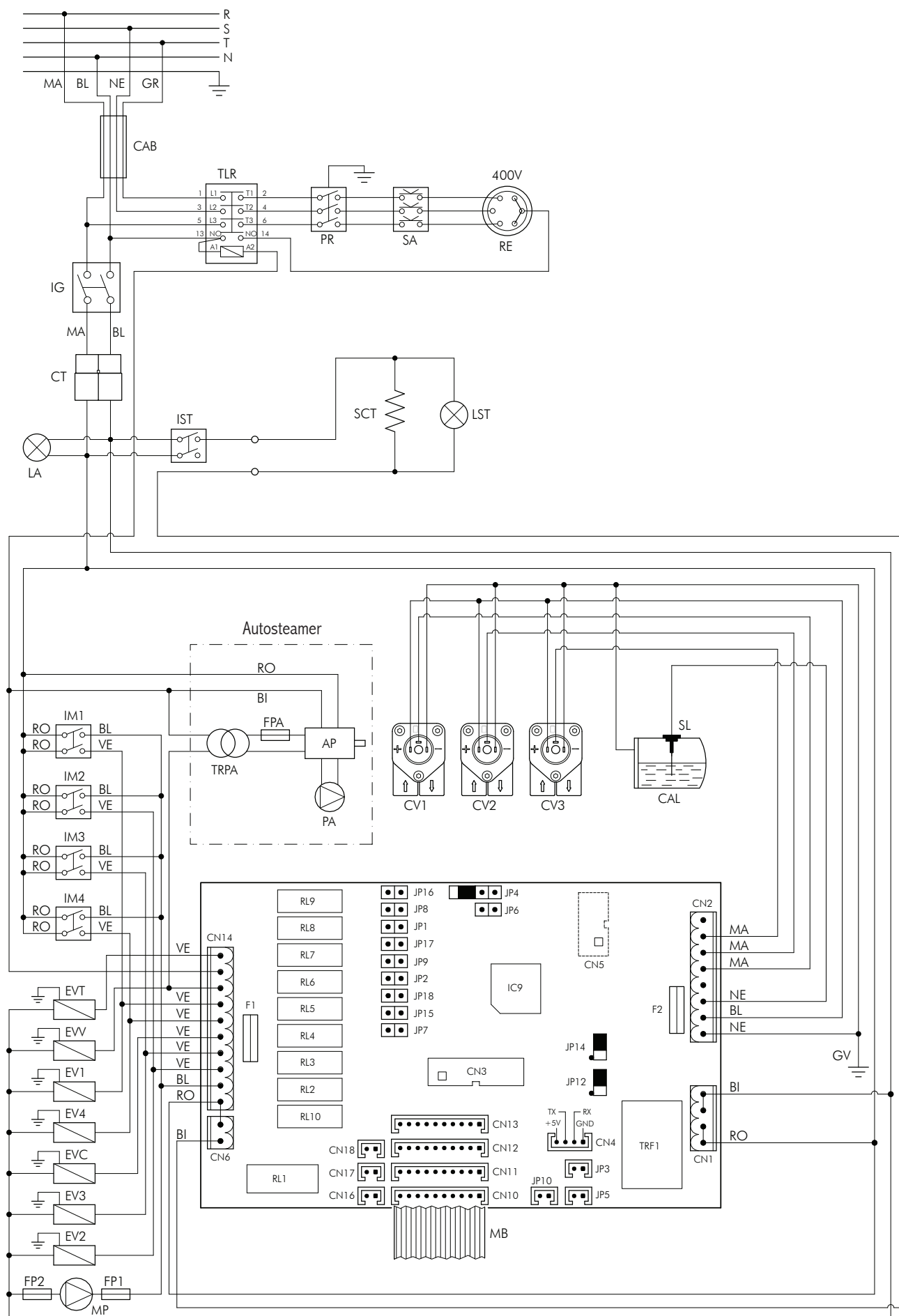
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

<b>JUMPER</b>	<b>INSERTED</b>	<b>NOT INSERTED</b>
<b>JP1</b>	Serial transmission enabled	Serial transmission disabled
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Programming switch connector	
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Tea delivery	
<b>JP6</b>	Tea delivery with pump	Tea delivery without pump
<b>JP7</b>	STOP key continuat. disabled	STOP key continuation enabled
<b>JP8</b>	Dosis check enabled	Dosis check disabled
<b>JP9</b>	Credit/Debit enabled	Credit/Debit disabled
<b>JP15</b>	Display function keys enabled	Display function keys disabled
<b>JP16</b>	6-key dosing enabled	4-key dosing enabled
<b>JP17</b>	Check boiler t° with external pressure (always on)	
<b>JP18</b>	Check boiler temp/press ON (always on)	

## 6.11 Electrical diagram code 18090079-80





<b>AP</b>	Power air pump
<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN1</b>	Power supply connector
<b>CN2</b>	Low voltage connector
<b>CN3</b>	Display connector
<b>CN4</b>	Serial connector
<b>CN5</b>	ISP programming
<b>CN6</b>	Heating elem.cup connector
<b>CN10</b>	Push button GR1 connector
<b>CN11</b>	Push button GR2 connector
<b>CN12</b>	Push button GR3 connector
<b>CN13</b>	Push button GR4 connector
<b>CN14</b>	Services outputs connector
<b>CN16</b>	Autosteamer NTC connector
<b>CN17</b>	Boiler NTC connector
<b>CN18</b>	Cup heating NTC connector
<b>CPA</b>	Air pump control
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>CV4</b>	GR4 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EV4</b>	GR4 solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>EVV</b>	Autosteamer solenoid valve
<b>IC9</b>	Microprocessor
<b>IG</b>	Power switch
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IM4</b>	GR4 delivery switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MB</b>	Push button membrane
<b>MP</b>	Motor pump
<b>PA</b>	Air pump Vcc
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SCT</b>	Cup heating element
<b>SL</b>	Level probe
<b>TLR</b>	Contacteur
<b>TRF1</b>	Transformer
<b>TRPA</b>	Air pump transformer

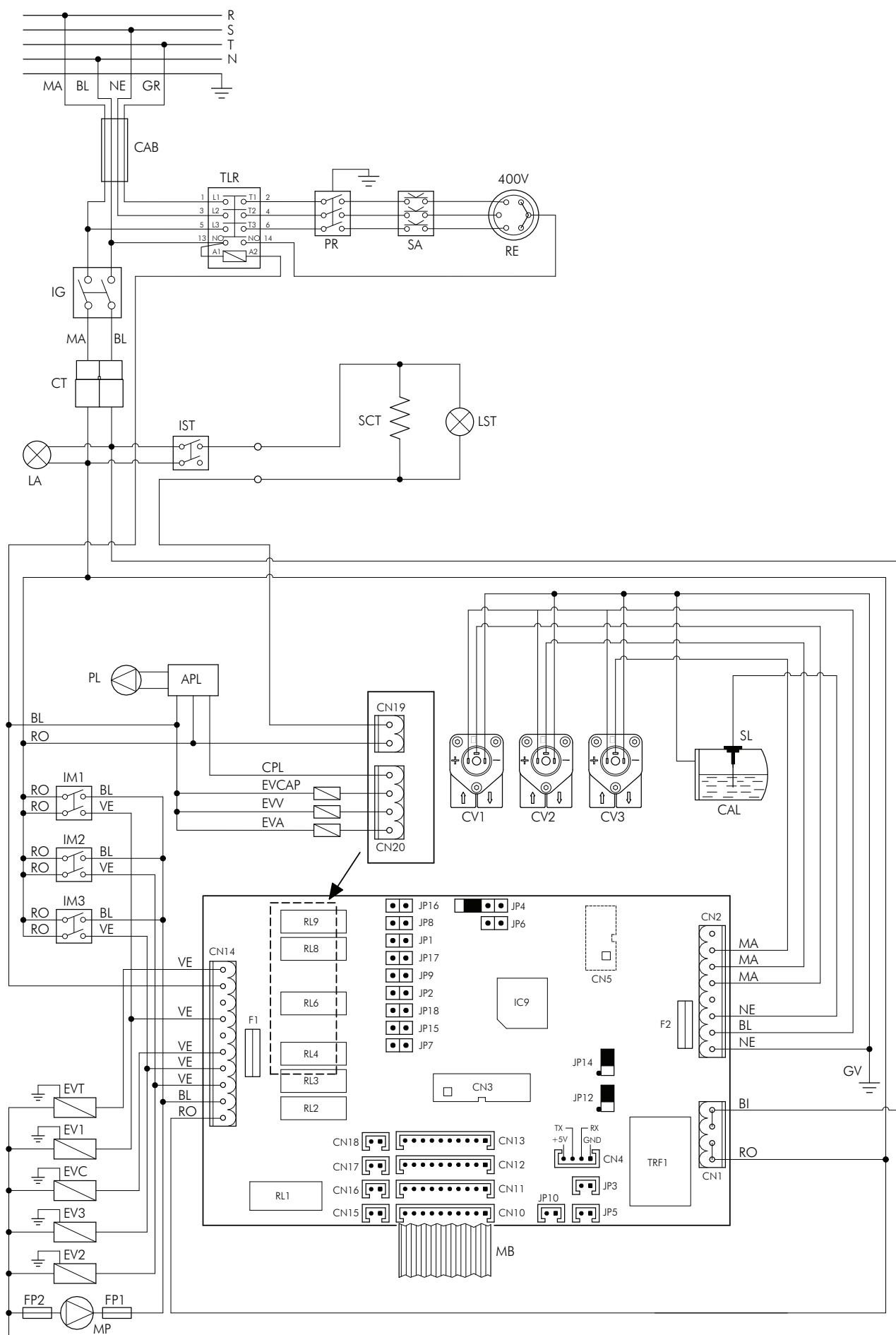
<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

<b>JUMPER</b>	<b>INSERTED</b>	<b>NOT INSERTED</b>
<b>JP1</b>	Serial transmission enabled	Serial transmission disabled
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Programming key connector	
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Tea delivery	
<b>JP6</b>	Tea delivery with pump	Tea delivery without pump
<b>JP7</b>	STOP key continuat. disabled	STOP key continuation enabled
<b>JP8</b>	Dosis check enabled	Dosis check disabled
<b>JP9</b>	Credit/Debit enabled	Credit/Debit disabled
<b>JP10</b>	Autosteamer	
<b>JP12</b>	Not managed	Not managed
<b>JP14</b>	Not managed	Not managed
<b>JP15</b>	Display function keys enabled	Display function keys disabled
<b>JP16</b>	6-key dosing enabled	4-key dosing enabled
<b>JP17</b>	Check boiler t° with external pressure (always on)	
<b>JP18</b>	Check boiler temp/press ON (always on)	

## 6.12 Electrical diagram code 18090051-52



<b>APL</b>	Power milk pump
<b>CAB</b>	Machine cable
<b>CAL</b>	Boiler
<b>CN1</b>	Power supply connector
<b>CN2</b>	Low voltage connector
<b>CN3</b>	Display connector
<b>CN4</b>	Serial connector
<b>CN5</b>	ISP programming
<b>CN10</b>	Push button GR1 connector
<b>CN11</b>	Push button GR2 connector
<b>CN12</b>	Push button GR3 connector
<b>CN13</b>	Autosteam/capp. connector
<b>CN14</b>	Services outputs connector
<b>CN16</b>	Steam NTC connector
<b>CN17</b>	Boiler NTC connector
<b>CN18</b>	Cup heating NTC connector
<b>CPL</b>	Milk pump control
<b>CT</b>	Power supply connector
<b>CV1</b>	GR1 volumetric counter
<b>CV2</b>	GR2 volumetric counter
<b>CV3</b>	GR3 volumetric counter
<b>EV1</b>	GR1 solenoid valve
<b>EV2</b>	GR2 solenoid valve
<b>EV3</b>	GR3 solenoid valve
<b>EVA</b>	Air solenoid valve
<b>EVC</b>	Boiler filling solenoid valve
<b>EVCAP</b>	Cappuccin. solenoid valve
<b>EVT</b>	Tea solenoid valve
<b>EVV</b>	Autosteamer solenoid valve
<b>IC9</b>	Microprocessor
<b>IG</b>	Power switch
<b>IM1</b>	GR1 delivery switch
<b>IM2</b>	GR2 delivery switch
<b>IM3</b>	GR3 delivery switch
<b>IST</b>	Cup heating device switch
<b>LA</b>	Indicator light
<b>MP</b>	Motor pump
<b>PL</b>	Milk pump
<b>PR</b>	Pressure
<b>RE</b>	Heating element
<b>SA</b>	Heating element protection
<b>SCT</b>	Cup heating element
<b>SL</b>	Level probe
<b>TLR</b>	Contacteur
<b>TRF1</b>	Transformer

<b>BI</b>	White
<b>BL</b>	Blue
<b>GR</b>	Grey
<b>GV</b>	Yellow-green
<b>MA</b>	Brown
<b>NE</b>	Black
<b>RO</b>	Red
<b>VE</b>	Green

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

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

<b>JUMPER</b>	<b>INSERTED</b>	<b>NOT INSERTED</b>
<b>JP1</b>	Serial transmission enabled	Serial transmission disabled
<b>JP2</b>	Pre-infusion enabled	Pre-infusion disabled
<b>JP3</b>	Programming key connector	
<b>JP4</b>	Boiler filling with pump	Boiler filling without pump
<b>JP5</b>	Tea delivery	
<b>JP6</b>	Tea delivery with pump	Tea delivery without pump
<b>JP7</b>	STOP key continuat. disabled	STOP key continuation enabled
<b>JP8</b>	Dosis check enabled	Dosis check disabled
<b>JP9</b>	Credit/Debit enabled	Credit/Debit disabled
<b>JP10</b>	Tea 2 connection	
<b>JP12</b>	Not managed	Not managed
<b>JP14</b>	Not managed	Not managed
<b>JP15</b>	Display function keys enabled	Display function keys disabled
<b>JP16</b>	6-key dosing enabled	4-key dosing enabled
<b>JP17</b>	Check boiler t° with external pressure (always on)	
<b>JP18</b>	Check boiler temp/press ON (always on)	
<b>JP22</b>	Indar programming	





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