

CMA MACCHINE PER CAFFÈ S.r.l.

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2006/42/CE Machinery Directive

AL
AEP
SAE
DISPLAY

ESPRESSO COFFEE MAKER

Use and maintenance manual. TECHNICIANS instructions.

EN

Astoria[®]
Think espresso

IMPORTANT: Read carefully before use - Store for future reference

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ESPRESSO COFFEE MACHINE

Use and maintenance manual. TECHNICIANS instructions

English

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1. INTRODUCTION

Read this manual carefully. It provides important information on the safety to the Technician during the operations indicated in this document.

Keep this Manual in a safe place. If you lose it, you can ask the Manufacturer for another copy.

The Manufacturer of the equipment cannot be held responsible for damage caused by failure to oblige to the requirements listed in this manual.



Before using the machine, read the instructions contained in this publication and follow the guidelines carefully. Keep this manual and all publications attached in an accessible and secure place.

This document assumes that in the locations where the machine is installed, the relevant safety standards and work hygiene are observed.

The instructions, drawings and documentation contained in this manual are technical and confidential, the sole property of the Manufacturer, and may not be reproduced in any way, either in full, or in part.

The Manufacturer reserves the right to make any improvements and/or modifications to the product. We guarantee that this Manual reflects the technical state of the appliance at the time it is marketed.

We encourage the Qualified Technicians to make any proposals for improvement of the product or the Manual.

1.1 Guidelines for reading the Manual

The Manual is divided into separate chapters. The sequence of chapters responds to the temporal logic of the life of the machine.

Terms, abbreviations and pictograms are used to facilitate the immediate understanding of the text.

This Manual is constituted by a cover, an index and a series of chapters. Each chapter is numbered in sequence. The page number is in the footer.

The nameplate of the machine and the CE Declaration of Conformity show the machine identification data, the last page shows the date and revision of the Instructions Manual.

ABBREVIATIONS

- Sect.** = Section
- Chap.** = Chapter
- Par.** = Paragraph
- P.** = Page
- Fig.** = Figure
- Tab.** = Table

MEASUREMENT UNIT

The measurement units are those provided by the International System (SI).

PICTOGRAMS

Descriptions preceded by these symbols contain information/very important requirements, particularly as regards safety. Failure to comply may result in:

- dangers for the safety of those operating the machine;
- injury, also serious (in some cases even death);
- loss of the guarantee;
- manufacturer's liability waiver.



DANGER symbol used in case of danger of permanent serious injury that requires hospitalization, or causes death in extreme cases.



CAUTION symbol used in case of risk of minor injury that requires medical attention.



WARNING symbol used in case of danger of minor injury that can be treated with first aid or the like.



NOTE symbol used to provide important information related to the topic.

1.2 Storing the Manual

The Instructions Manual must be stored carefully. Storage should be favoured by handling it with care, with clean hands and not depositing it on dirty surfaces. The Manual must be stored in an environment protected from moisture and heat.

Do not remove, torn or arbitrarily modify any of its parts.

At the request of the Qualified Technician, the manufacturer can provide additional copies of the Instructions Manual of the machine.

1.3 Method for updating the Instruction Manual

The Manufacturer reserves the right to modify and make improvements to the machine without notifying it and without updating the Manual already delivered.

Moreover, in case of substantial changes to the already installed machine involving the modification of one or more chapters of the Instruction Manual, the Manufacturer will send the Qualified Technicians the chapters affected by the changes or the revision of the entire manual.

It is the Qualified Technicians' responsibility, to replace the old document with the new revision.

The manufacturer is responsible for the Italian descriptions; the translations cannot be fully verified; therefore, in case of inconsistency, users must pay attention to the Italian version and possibly contact the Manufacturer, who will make the appropriate changes.



If the manual should become illegible or otherwise hard to consult, the Qualified Technicians is obliged to request a new copy from the Manufacturer before carrying out any work on the machine. It is absolutely forbidden to remove or rewrite parts of the Manual. The instructions, drawings and documentation contained in this manual are confidential and the sole property of the Manufacturer, and may not be reproduced in any way, either in full, or in part without prior authorization.

Qualified Technicians are responsible for the compliance with the instructions contained in this Manual.

For any incident that should occur as a result of incorrect use of these recommendations, the Manufacturer declines any liability.

1.4 Recipients

This Manual is intended for the Manufacturer's Qualified Technicians, to whom the following operations pertaining to the machine are assigned:

- Transport and handling;
- Storage;
- Installation;
- Commissioning;
- Maintenance;
- Cleaning;
- Spare part replacement;
- Emergency operations and faults;
- Decommissioning;
- Dismantling;
- Disposal;

QUALIFICATION OF RECIPIENTS

The machine is intended for professional and not generalized use, so it can be used by Qualified Technicians, in particular who:

- Have attended the training courses organized by the Manufacturer relating to the type of machine;
- Have reached the age of majority;
- Are physically and mentally fit for using the machine;
- Are able to understand and interpret the Instruction Manual and the safety requirements;
- Know the safety procedures and their implementation;
- Possess the ability to use of the machine;
- Understand the procedures of use defined by the machine manufacturer.

1.5 Glossary and Pictograms

This paragraph lists uncommon terms or terms with different meaning from the ordinary.

Below is an explanation of the abbreviations used and the meaning of the pictograms to indicate the operator qualification and the machine status; their use allows to quickly and uniquely provide the necessary information for proper use of the machine in safe conditions.

1.5.1 GLOSSARY

User

The person in charge of the periodic maintenance and cleaning of the machine indicated in the User's Manual.

Manufacturer's Qualified Technician

A specialist, specially trained and qualified to make the connection, installation and assembly of the machine; use special equipment (hoists, forklifts, etc.); perform routine or unscheduled maintenance which is particularly complicated or potentially dangerous if performed by the User.

Qualification of the User or Qualified Technician

Minimum level of skills an operator must have to carry out the operation described.

Danger

A potential source of injury or damage to health.

Dangerous area

Any area in the vicinity of the machine where the presence of a person constitutes a risk to the safety and health of that person.

Risk

Combination of the probability and severity of an injury or damage to health that can arise in a hazardous situation.

Guard

Machine component used specifically to provide protection by means of a physical barrier.

Personal Protection Equipment (PPE)

Clothing worn or equipment held by the person for the protection of health or safety.

Intended use

The use of the machine in accordance with the information provided in the instructions for use.

Machine status

The machine status includes the mode of operation and the condition of the safety devices on the machine.

Residual risk

Risks that remain despite adopting the protective measures integrated into the machine design and despite the guards and complementary protective measures adopted.

Safety component










- required to perform a safety function;
- whose failure and/or malfunction endangers the safety of persons.

1.6 Guarantee

The machine is covered by a 12-month guarantee on all components, except electrical and electronic components and expendable pieces.

Any action taken on the electronics of the machine when the machine is still supplied with electrical power automatically invalidates any guarantee.

1.5.2 PICTOGRAMS

PICTOGRAM	DESCRIPTION
	Electrical hazard
	Equipotential hazard
	Danger of high temperature
	Hand crush hazard
	Prohibition of maintenance with moving parts
	Mandatory use of protective gloves
	Mandatory use of eye protection
	Mandatory use of protective shoes
	Obligation to read the documentation

1.7 Customer service



2. IDENTIFICATION OF THE MACHINE

2.1 Make and model designation

The identification and the model of the machine are found on the NAMEPLATE and in the EC DECLARATION OF CONFORMITY provided with the machine.

Below are some of the machine identification data.

2.2 General description

The machine object of this Manual consists of mechanical, electrical, and electronic components whose combined action allows to make milk, coffee and water-based beverages.

This product is manufactured in compliance with EU Directives, Regulations and Standards indicated in the EC DECLARATION OF CONFORMITY provided with the machine.

This machine is designed and constructed to operate only after being properly connected to a hydraulic and electrical network and placed so as to be sheltered from atmospheric agents.

2.3 Intended use

The espresso coffee machine is designed for the professional preparation of hot drinks such as tea, cappuccino and weak, strong and espresso coffee, etc.

The device is not intended for home use.

The machine can be used in all operational conditions contained or described in the User's Manual and in this document; any other conditions must be considered dangerous.

PERMITTED USES

All uses compatible with the technical characteristics, operations and applications described in the User's Manual and in this document that do not endanger the safety of the User or Technician, or cause damage to the machine or the environment.



All uses not specifically mentioned in the User's and Technician's Manual are prohibited and must be expressly authorized by the Manufacturer.

INTENDED USES

The machine is designed exclusively for professional use.

The use of products/materials other than those specified by the Manufacturer, which can cause damage to the machine and dangerous situations for the operator and/or those close to the Machine, is considered incorrect or improper.

CONTRAINDICATIONS OF USE

The machine must not be used:

- For uses other than those listed in par. 2.3 , or for uses not mentioned in this Manual;
- With materials other than those listed in this Manual;
- With disabled or not working safety devices.

INCORRECT USE OF THE MACHINE

The type of use and performance this machine is designed for, imposes a number of operations and procedures that cannot be changed, unless previously agreed with the Manufacturer. All allowed practices are contained in this document, any operation not listed and described in this document is to be considered not possible and therefore dangerous.

IMPROPER USE

The only permitted uses are described in the Manual, any other use is to be considered not possible and therefore dangerous.

GENERAL SAFETY

The Qualified Technician must be aware of the risk of accidents, the devices designed for safety, and the general rules on the safety provided by EU directives and by the legislation of the country where the line is installed.

Qualified Technicians should be aware of all machine devices operation.

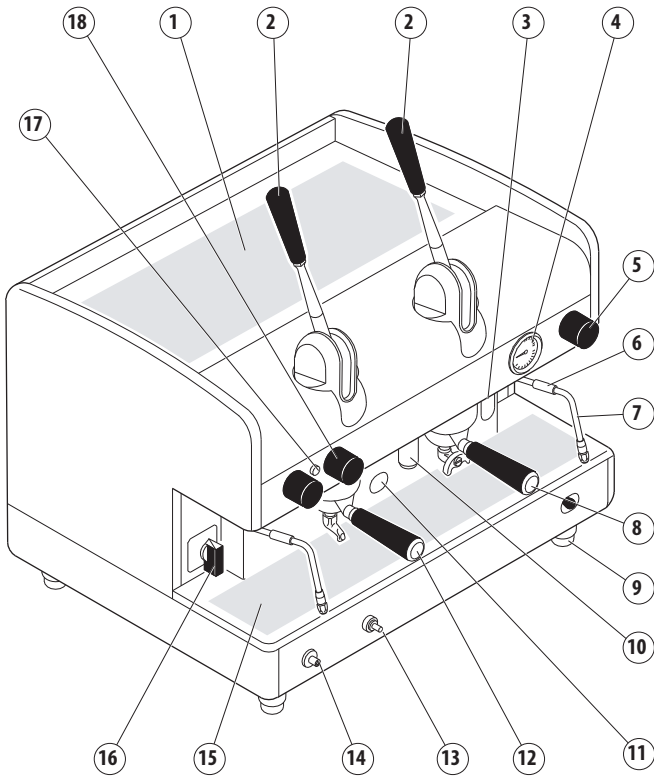
They must also have fully read this manual.

The maintenance work must be performed after specially preparing the machine.

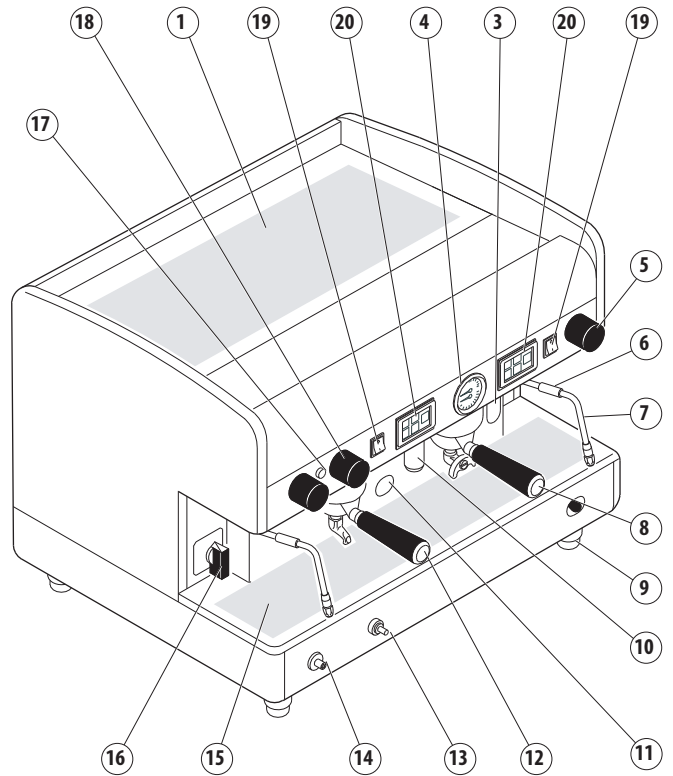
Tampering or unauthorized substitution of one or more parts of the machine, the use of accessories that modify the use and the employment of materials other than those recommended in this Manual, may become a cause of accidents.

2.4 Machine description

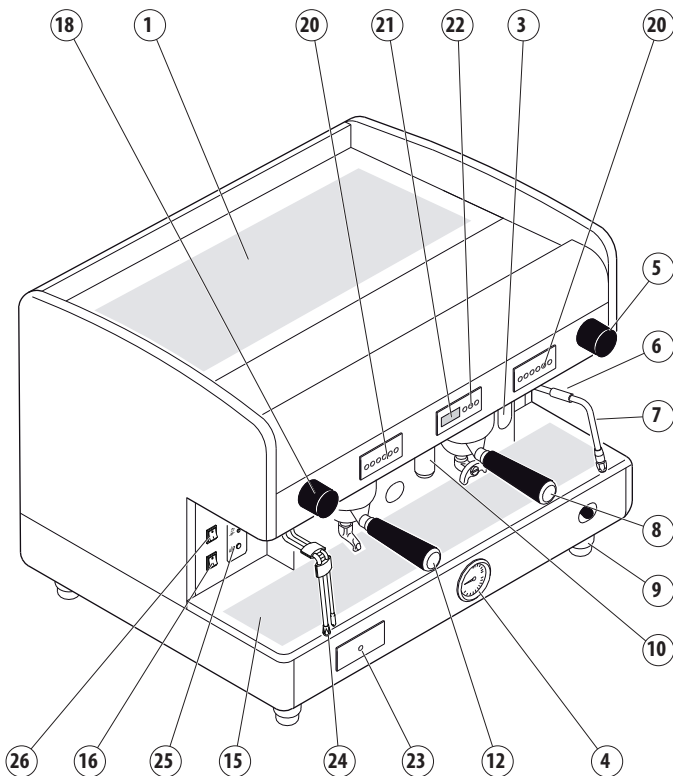
AL Version



AEP - SAE Version



DISPLAY Version

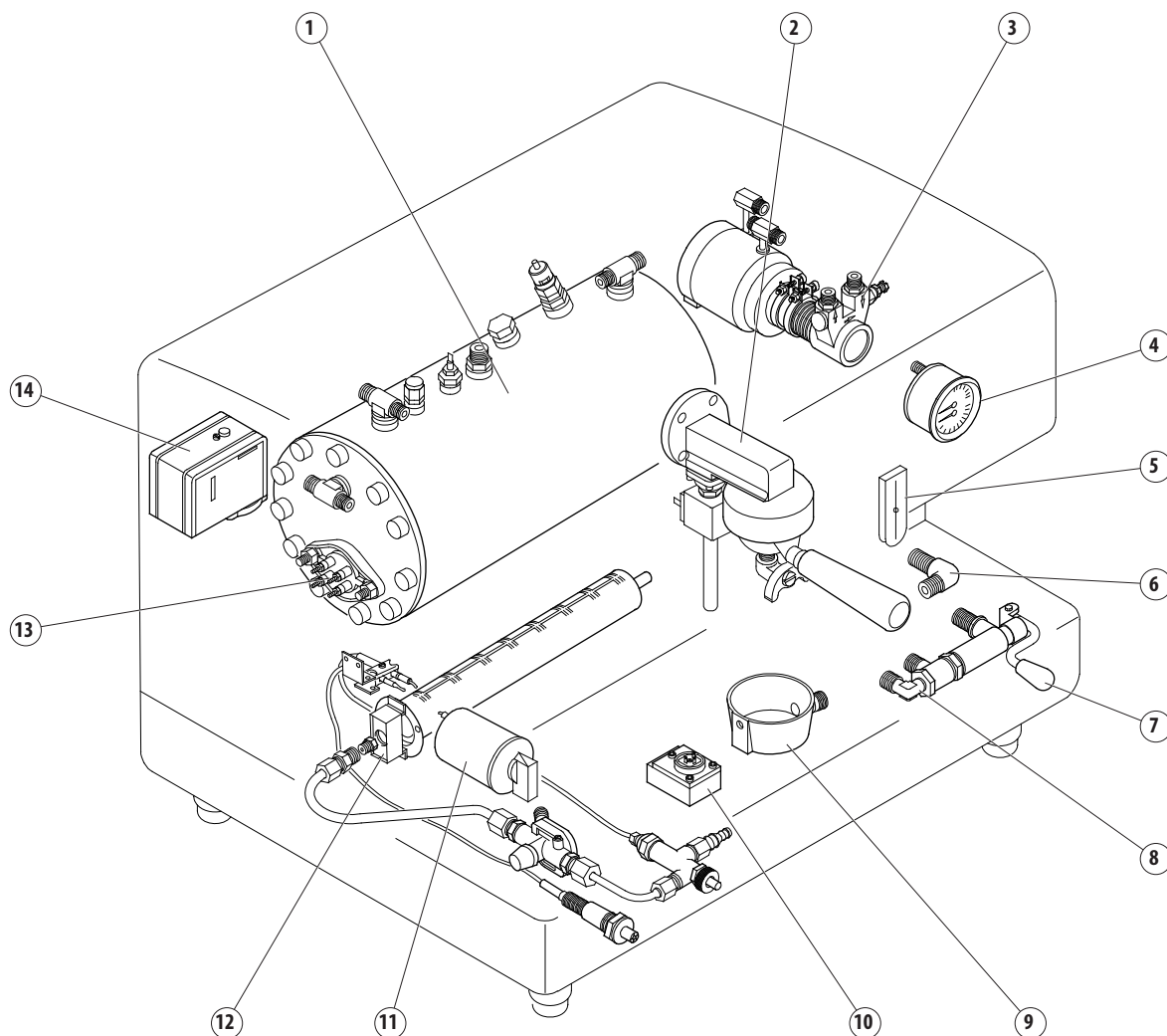


1. Cup heater surface.
2. Lever groups.
3. Optical boiler water level (**).
4. Pressure gauge
5. Steam knob.
6. Burn protection
7. Steam nozzle
8. 2-Cup filter holder.
9. Adjustable foot.
10. Hot water nozzle
11. Gas burner inspection window (*).
12. 1-Cup filter holder.
13. Gas safety (*).
14. Gas ignition push button (*).
15. Cup-rest grid
16. ON switch
17. Machine on indicator light.
18. Hot water knob
19. Manual dispensing push-buttons (AEP).
20. Push button panel (SAE).
21. Display
22. Manual and water dispensing push buttons (DISPLAY).
23. Autosteamer push-button panel (*).
24. Autosteamer nozzle (*).
25. Machine/cup heater lights.
26. Cup heater switch

(*). Optional device.

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

2.5 Internal components



1. Boiler
2. Dispensing group.
3. Internal motor pump (*).
4. Boiler/motor pump pressure gauge.
5. Boiler level-check window
6. Internal pump water attachment connection (*).
7. Manual water pump.
8. External pump water attachment connection.
9. Drain pad.
10. Volumetric dosing device (SAE-DISPLAY).
11. Machine power switch.
12. Gas system (*).
13. Electric heating element.
14. Pressure switch.
15. Transformer
16. Work surface LED light
17. Boiler thermostat
18. Boiler pressure switch

(*). Optional device.

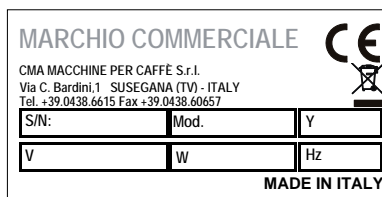
2.6 Data and CE marking

The technical data of the machine is shown in the following table:

TECHNICAL DATA TABLE	JUN	1GR	COMPACT	2GR	3GR	4GR
Voltage (V)	120 230-400 240	120 230-400 240	120 230-400 240	120 230-400 240	230-400 240	230-400 240
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Max power (kW)	2.4 kW	2.4/3.1/3.3	3.1	3.1/3.9/4.2	5.6/6.0	6.6/7.1
Boiler (l)	5	6/8	7	10.5/14	17/21	23
Safety valve calibration (bar)	1.9 bar					
Boiler operating pressure	0.8 - 1.4 bar					
Feedwater pressure	1,5 - 5 bar MAX					
Coffee dispensing pressure	8 - 9 bar					
Operation mode temperature	5 - 40°C 95° MAX R.U.					
Sound pressure level	< 70 dB					

According to the Directive 2006/42/EC, the machine is marked with the CE marking, by which the manufacturer declares, under its own responsibility, that the machine is safe for people and things.

The CE nameplate is affixed to the base of the frame under the drain pan on which the identification data is reported. Below is an example of the nameplate:



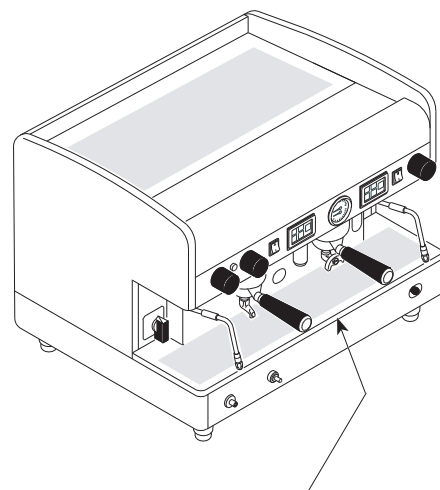
For any communication with the Manufacturer, always note the following information:

- S/N - machine serial number;
- Mod. - machine model
- Y - year of manufacture;

The data of the appliance can be seen also on the label located on the package of the machine.



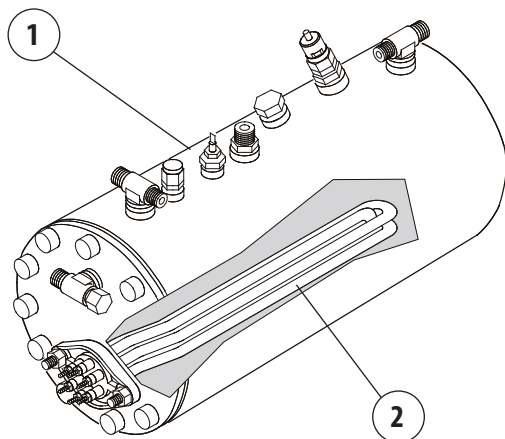
It is forbidden to remove or damage the nameplate. If it needs replacing urgently, always exclusively contact the Manufacturer.



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

2.6.1 Boiler

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



ELECTRIC HEATING

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

GAS HEATING

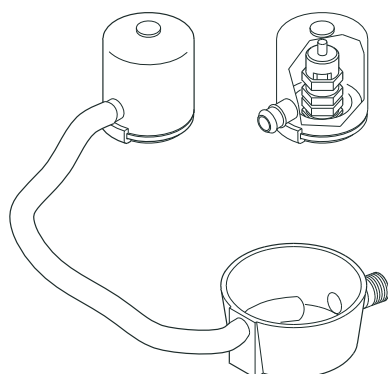
Gas heating is obtained by supplying the flame of the burner located under the boiler

ELECTRIC + GAS HEATING

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

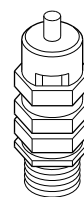
2.6.2 Overflow device

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



2.6.3 Pressure relief safety valve

The pressure relief safety valve has a calibration of 1.9 bar in order to ensure that the pressure in the boiler services does not exceed the value of 2.1 bar. In case of malfunction, the valve can eliminate all the excess pressure from the boiler.



The safety valve should be checked regularly as indicated in Chapter "8.3 Maintenance" on page 34".

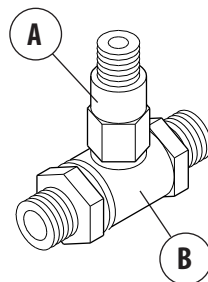


On all machines with 4 groups, two safety valves are installed.

2.6.4 Expansion - non-return valve

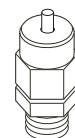
This is a valve consisting of an expansion valve and a non-return valve.

- **expansion valve (A):**
The cold water sent from the exchanger pump to the 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 (B):**
Its function is that of preventing the backflow of water from the exchangers in the hydraulic circuit.



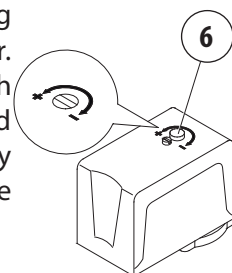
2.6.5 Negative pressure valve

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.



2.6.6 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.



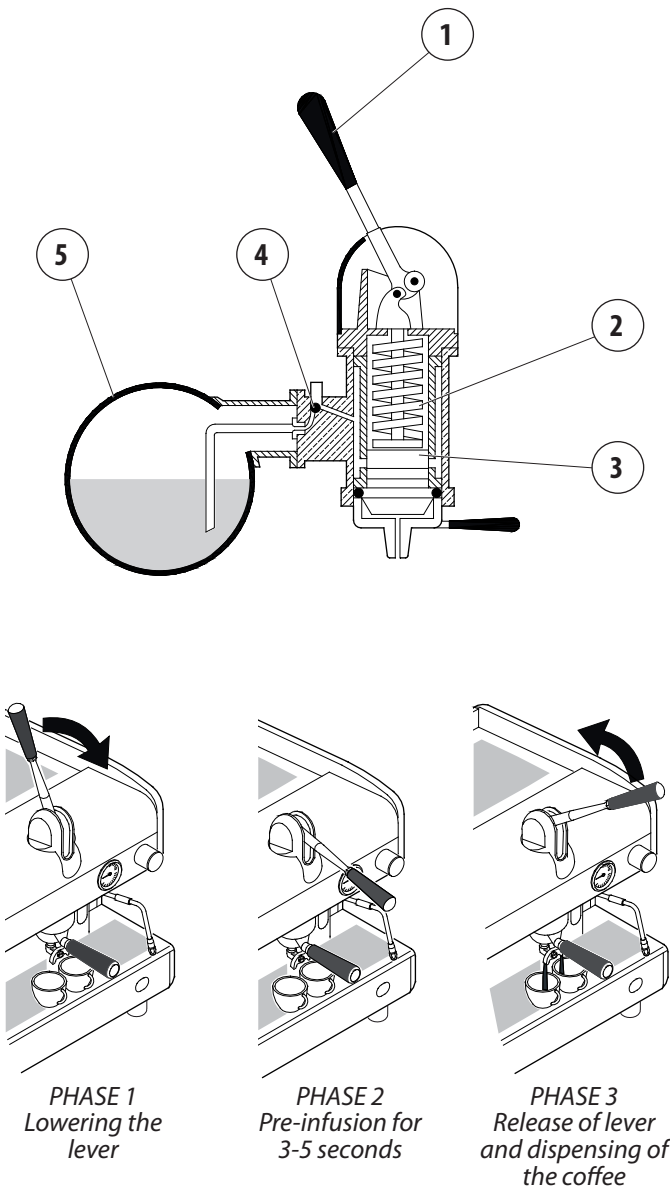
2.6.7 LEVER groups

Lever groups use 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 dispensing of espresso coffee.

The non-return ball valve (4) keeps water from flowing back into the boiler (5).



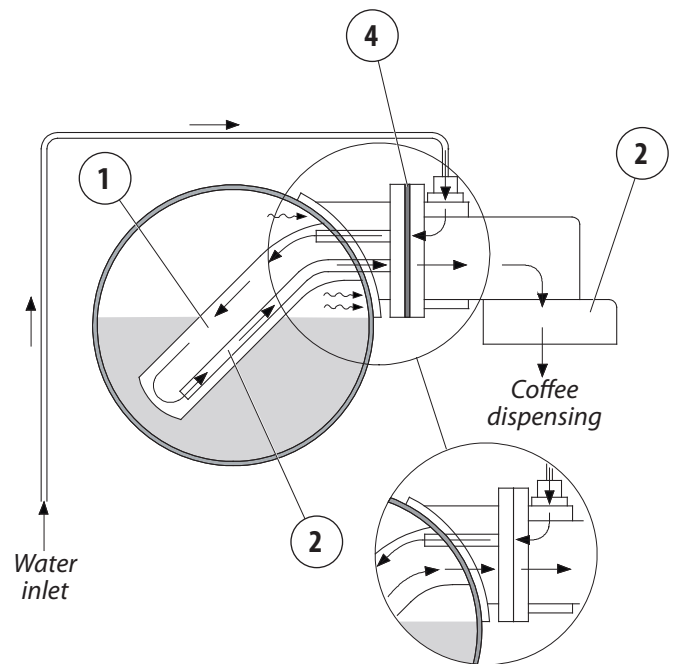
2.6.8 Group with EXTRACTABLE system

Heating of the dispensing group is provided by direct contact with the boiler. Water used for dispensing 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 dispensing;
- 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 dispensing 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.

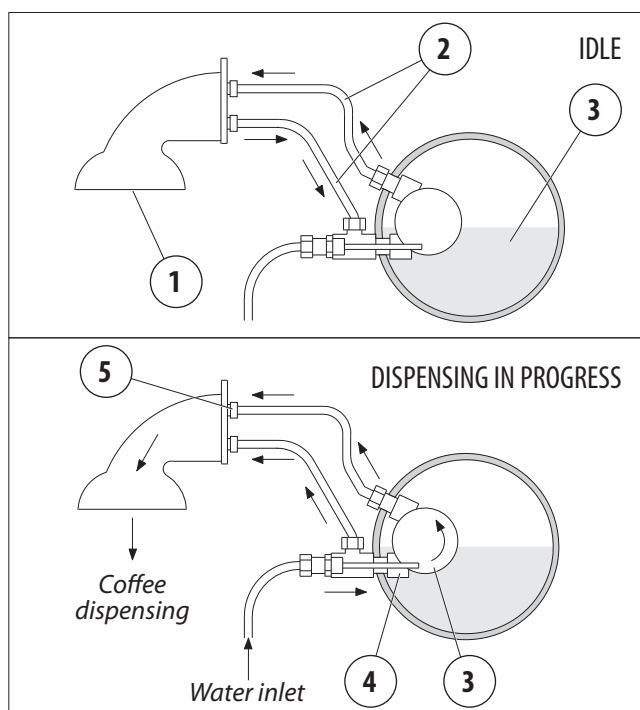
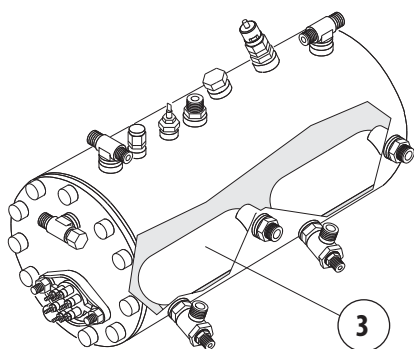


2.6.9 CTS group (with thermosiphonic circuit)

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

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

The injector (4) and the flow reducer (5) are important components for the operation of the dispensing group. To increase the coffee extraction temperature, remove the flow reducer (5) or replace it with one of a larger 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.

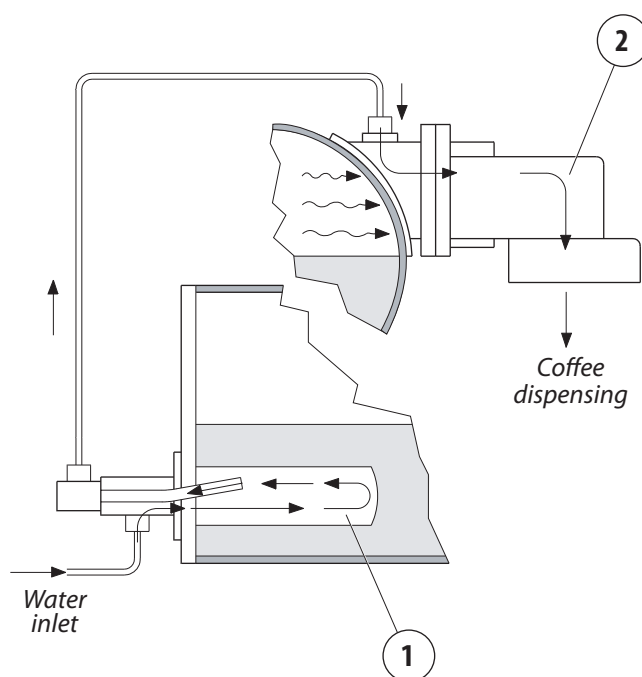


2.6.10 Group with BOOSTED system

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

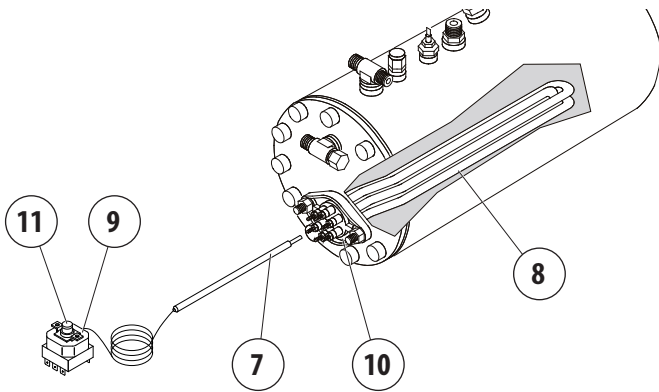
- The activation of the solenoid valve and of the pump allows cold water to enter the exchanger (1);
- from the exchanger (1) the boiler water is carried to the group (2) for dispensing;
- the pump allows the increase of the pressure of the water flow up to 8-9 bar.

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.



2.6.11 Safety thermostat

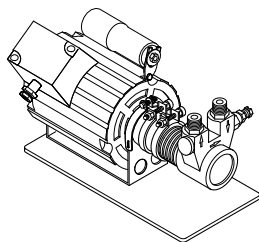
The thermostat allows you to avoid damage to the electrical resistance in case of lack of water in the boiler. The thermostat bulb (7) is located inside a sheath (8) placed at the center of resistance. The contacts of the thermostat (9) are connected to the electrical resistance (10). If the electrical 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.



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.

2.6.12 Motor pump

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

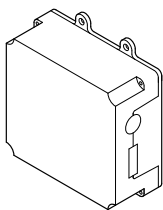


2.6.13 Electronic control unit

The electronic control unit is installed on SAE and DISPLAY versions.

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 dispensing accounting systems by means of a specific interface device.



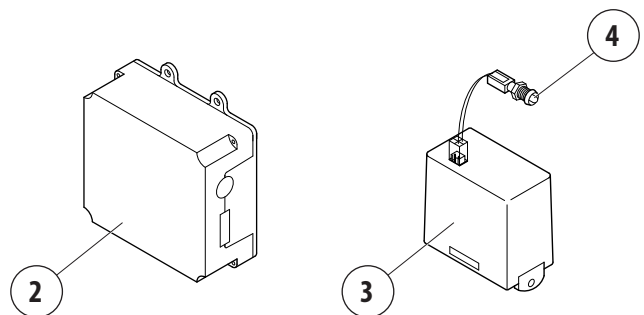
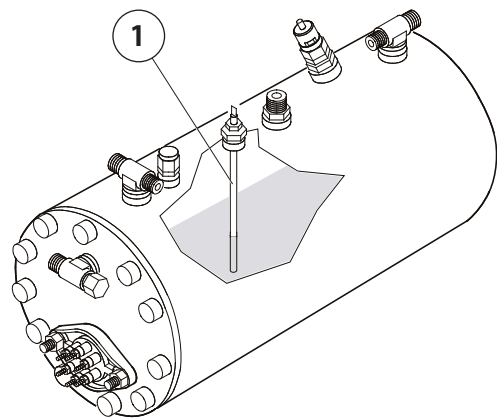
2.6.14 Automatic Water Entry

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-DISPLAY versions, electronic level regulator on the other versions (3);
- hydraulic circuit with a solenoid valve controlled by the regulator.

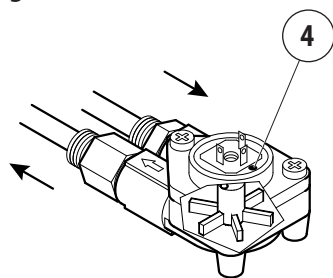
The electronic control unit controls the level of water in the boiler. When the level of water in the boiler drops, the contact with the probe is interrupted. The control unit sends an impulse to the entry solenoid valve and to the motor pump, which act to restore the normal level of water in the boiler.

To avoid possible flooding due to machine malfunctions or leaks in the hydraulic circuit, the electronic control unit includes a "Time-out" feature that cuts off automatic filling after a certain time (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.



2.6.15 Volumetric dispensing

The volumetric dispenser installed on SAE-DISPLAY versions serves the purpose of measuring the quantity of water sent to the group for coffee dispensing.



The dispenser generates electrical impulses which are sent to the electronic control unit.

These impulses are read by the control unit and counted during the programming of the dose.

The flashing LED light (4) indicates that the electrical impulse has been sent from the dosing device to the control unit.

2.6.16 Electronic push button panels

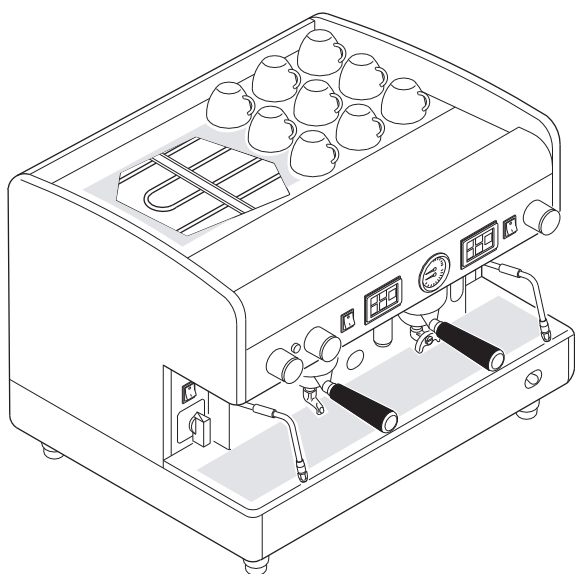
The electronic push button panels on SAE-DISPLAY versions allow selection and programming of the coffee doses. They are connected to the electronic control unit.

For use and programming see the user manual.

2.6.17 Cup heater

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

In some versions it is possible to adjust the temperature by following the instructions on the user manual.



2.6.18 Hot water nozzle

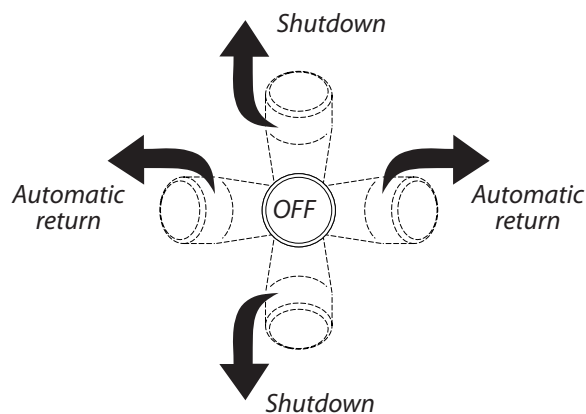
The hot water nozzle is connected to a suction pipe of the boiler. Depending on the model, hot water can be supplied in two ways:

- Manually: by turning the adjustment knob on the front of the machine;
- Automatically: by selecting a button connected to a solenoid valve.

2.6.19 Steam nozzle

The steam nozzle is connected to the top of the boiler. Depending on the model, steam can be supplied in two ways:

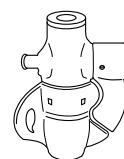
- Rotary knob: by turning the adjustment knob on the front of the machine;
- Lever knob: the steam is supplied through the horizontal or vertical movement of the knob.



2.6.20 Cappuccino maker (optional)

The cappuccino maker is installed on a steam nozzle. This device allows to both heat and foam the milk.

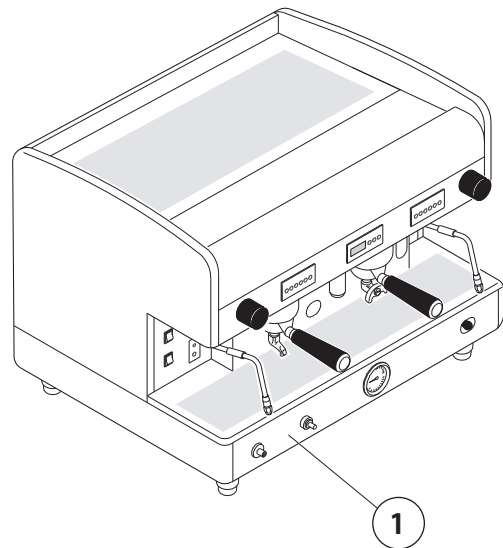
For adjusting and cleaning, follow the provisions in the user's manual.



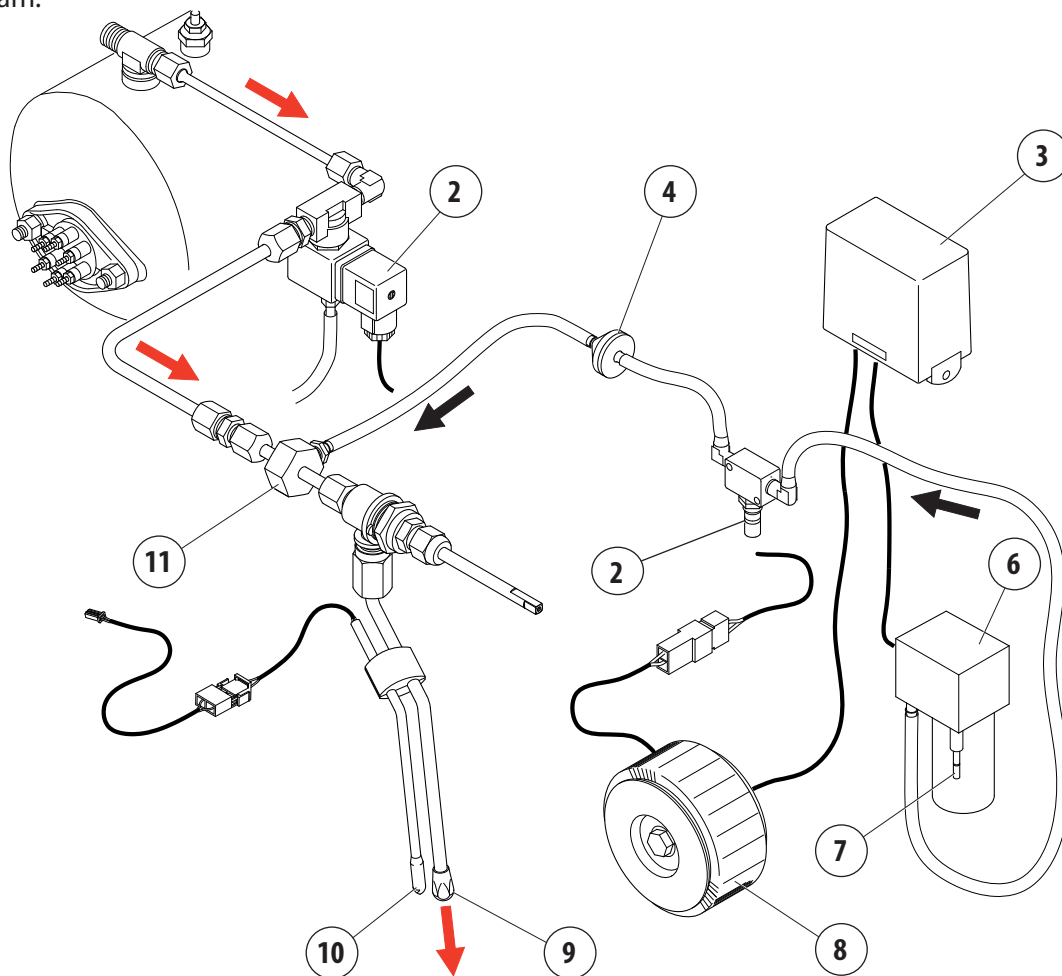
2.6.21 Autosteamer (optional)

The "Autosteamer" system, supplied with certain versions with display, can be used for automatically heating and foaming milk at the programmed temperature. 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 nozzle;
- 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);
- after passing through the non-return valve (4) the air mixes with the steam in the "Mixing interface" (11);
- leakage of steam from the nozzle (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.



To adjust the temperature and the milk foaming, see par. 6.8.1 on page 30 and par. 6.8.2 on page 30.



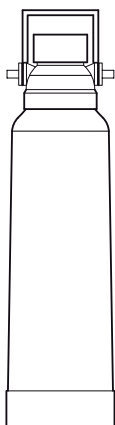
2.6.22 Water filter

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

Drinking water can also contain traces of heavy metals and substances, such as chlorine, harmful to health.

The filter makes it possible to eliminate or substantially reduce the presence of these mineral salts.

The cartridge contained in the water filter must be replaced at the frequency specified by the manufacturer.

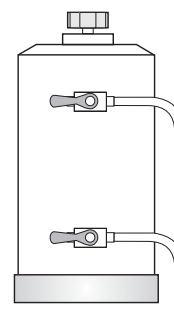


For the water filter use and maintenance, follow the provisions in par. "8.5 Water filter maintenance" on page 40.

2.6.23 Softener

The resin softener can be used as an alternative to the water filter.

This component 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. However, in locations where water is very hard, it will be necessary to regenerate it more frequently. The same is true of places in which there is a large consumption of hot water for tea or other uses.



For the softener use and regeneration, follow the provisions in par. "8.6 Softener regeneration" on page 42.

3. TRANSPORT AND HANDLING

3.1 Safety precautions

Handling operations must always and exclusively be performed by qualified personnel and in compliance with applicable safety and health regulations.

Before starting transport and/or handling, verify the route, dimensions needed, safety distances, places suitable for placement, and appropriate means to the operation.

Handling operations must be carried out by at least 2 people, or with the help of special lifting accessories.

In view of the substantial weight of the equipment, exercise caution and care in handling operations.

The manufacturer is not responsible for any injury or damage caused by attires, lifting equipment and personal equipment not suitable for the type of intervention that the operator must carry.



The packaging material must not be left within the reach of children, since it is a potential source of danger.

The following residual risks are present during the handling of the machine and cannot be eliminated:

	Hand crush hazard
--	-------------------

3.2 DPI characteristics

During transport of the machine, the following PPE are required:

	Mandatory use of protective gloves
	Mandatory use of protective shoes

3.3 Weight

MODEL:	1 GR	2 GR	3 GR	4 GR
Max gross weight	77 kg	104 kg	113 kg	130 kg

3.4 Handling the packed machine

Upon arrival, the machine must be unloaded and handled with care, carefully following the instructions on the packaging, or those contained in this Manual.

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

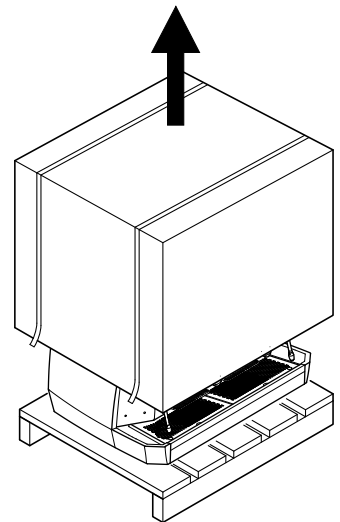


It is very important to verify that the maximum load of the individual lifting equipment, at least corresponds to the loads to be lifted, plus the safety margins required by current standards.

3.5 Unpacking the machine

Remove the machine from its packaging only at the moment of installation to prevent accidental collisions that can damage it:

- Open the packaging, taking care not to damage the machine;
- remove and take out the protections of the machine and equipment contained in the package.
- take the machine out;
- dispose of the packaging in compliance with waste regulations.



After uninstalling the machine, check that there are no damaged parts due to transport or missing parts. Otherwise, immediately (no later than 7 days after dispensing) contact the TRANSPORTER and MANUFACTURER communicating the machine data and photographic documentation:

It is advisable to keep the packaging until after the guarantee has expired.

Wood, nails, staples, cardboard: non-polluting material but to be recycled properly.

Plastic: polluting material neither to be burned (danger of toxic fumes), nor dispersed in the environment; to be disposed of according to current regulations.

4. STORAGE

4.1 Overview

In the waiting period prior to installation, the machine must be stored by the Manufacturer or Authorized Distributor.

4.2 Storing the machine after the operation

If the machine is no longer used after a certain period of operation, store in the following conditions:

- Unplug the machine from the water and power mains;
- Empty all the internal circuits of the water.

Store the machine taking the following precautions:

- Store closed;
- Protect from shocks and stresses;
- Avoid contact with corrosive substances.

The machine was designed and built to operate in environments with the following characteristics:

- Room temperature: +5 + 40 °C
- Max relative humidity: 50% (at 40°C)

Any variation in these characteristics may decrease the average life of some components of the machine. Typical examples:

- ambient temperature: premature degrading of the engines.
- RH: premature degrading of seals and electronics.



If the environmental characteristics are significantly different from those listed, contact the MANUFACTURER before they become a source of problems.



After storage, before starting up the machine it is necessary to fully inspect the equipment.

5. INSTALLATION

5.1 Safety precautions

Installation must always and exclusively be performed by qualified personnel and in compliance with applicable safety and health regulations.

This appliance is to be considered completely safe only when it is connected to an efficient earthing system which is in compliance with safety standards.

The electric system must be equipped with a suitable GFCI (circuit breaker). It is important to have these requirements checked. If in doubt, have the system carefully checked by qualified personnel. The manufacturer cannot be considered responsible for any damage caused by an inadequate electric system.

Make sure that the supply power is enough to supply the necessary energy for the operation of the machine.

Perform the installation with the machine disconnected from the power supply through the main switch.

Where required, the gas system must be installed with caution and in strict compliance with local regulations.

Pay special attention to the correct injector depending on the type of gas used. Check for gas leaks.

In case of problems during the installation and/or malfunction, turn off the machine and contact the Manufacturer.

The components used during installation must ensure that the hygiene and safety requirements initially provided for the appliance are still met. These are met by using original spare parts only.

The following residual risks are present during the installation of the machine and cannot be eliminated:

	Electrical hazard
	Equipotential hazard
	Danger of high temperature
	Explosion hazard
	Prohibition to operate with moving parts






Use of the machine without all the installation operations carried out by Qualified Technical Personnel can result in serious damage to the equipment and people.



Any action taken on the electronics of the machine when the machine is still supplied with electrical power automatically invalidates any guarantee.

5.2 DPI characteristics

During installation of the machine, the following PPE are required:

	Mandatory use of protective gloves
	Mandatory use of eye protection
	Mandatory use of protective shoes

5.3 Environmental conditions

5.3.1 Room temperature

The electrical and electronic equipment mounted on the machine, has been designed and made to function properly in environments where the temperature is between +5 and +40 °C.

5.3.2 Relative humidity

The electrical and electronic equipment mounted on the machine, has been designed and made to function properly in environments where relative humidity does not exceed 50% at a temperature of 40 °C, or 90% at a temperature of 20 °C.

5.4 Installation space and operating space

Before the arrival of the machine, a suitable environment must be prepared:

- Location suited to the intended use and adequate space for comfortable use of the machine;
- adequate lighting, in accordance with applicable standards;
- earthing system compliant with applicable standards;
- electrical system compliant with applicable standards;
- for machines with gas system, the equipment must not be installed in environments with volume less than 12 m³, as provided by current standards.

5.5 Support base

To ensure a sufficient degree of ergonomics and safety to the machine, it is necessary to provide a support base with the following characteristics:

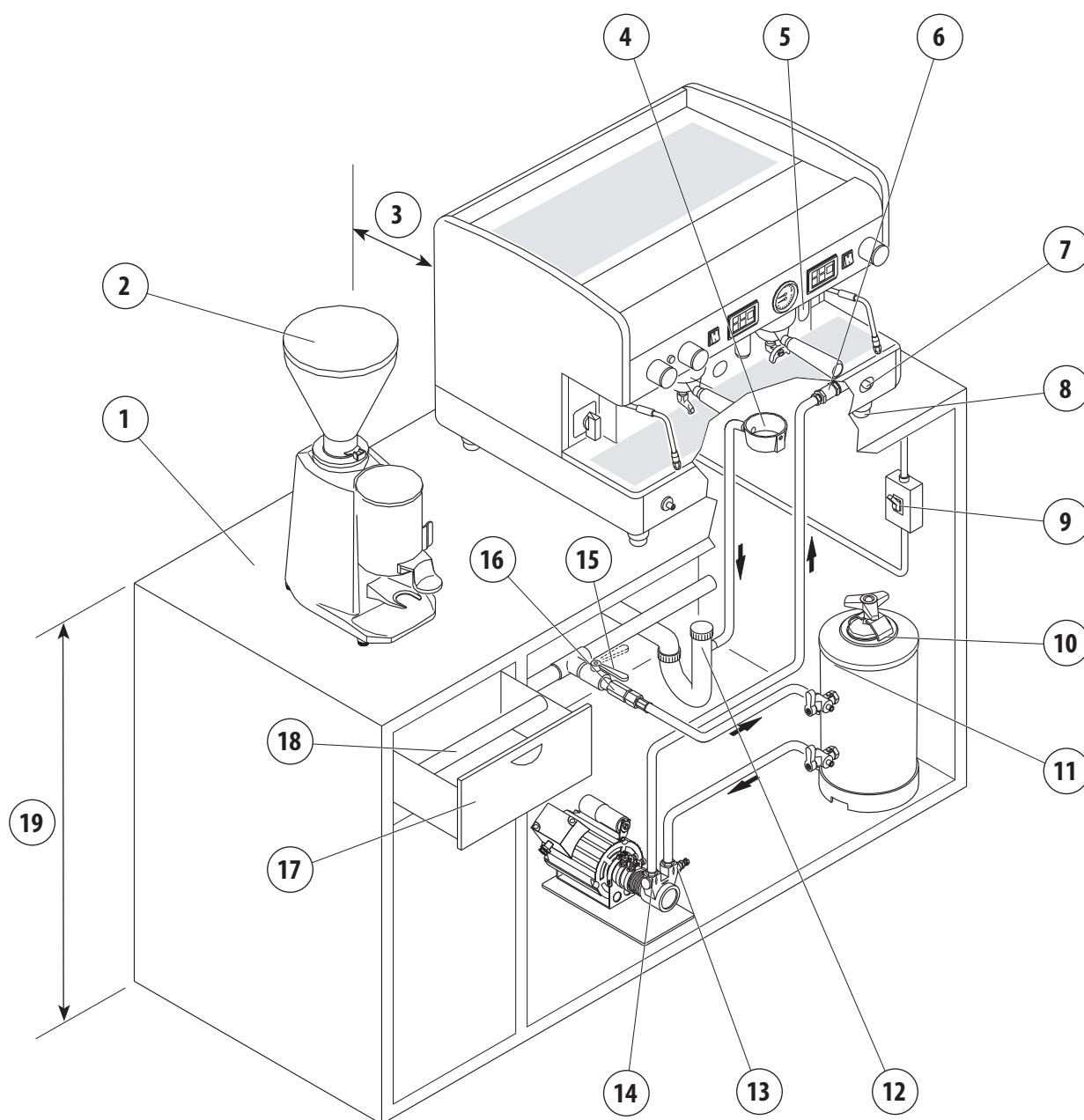
- Make sure that there is sufficient space for placing and correctly using the machine.
- the base should be comfortable and suitable for supporting the weight of the machine(1) and a height of about 90 cm (19);
- the base must be perfectly level and without irregularities;
- The base must be in close proximity to the terminals for the connection to the water mains (15), to the power supply (9), and, if needed, to the gas main;
- If the machine is positioned next to a wall, ensure a minimum distance of 20 cm between the machine and the wall (3).
- equip the working base of the machine with a drawer (17) for used coffee grounds, preferably with a rubber device (18) for tapping the filter holder;
- place the motor pump close to the support base, ensuring the area is free of moisture and away from accidental contact with the operator.



For correct operation and to ensure safety, the machine must rest on a perfectly horizontal surface.

Any alignment of the machine must be done by adjusting the feet (8).

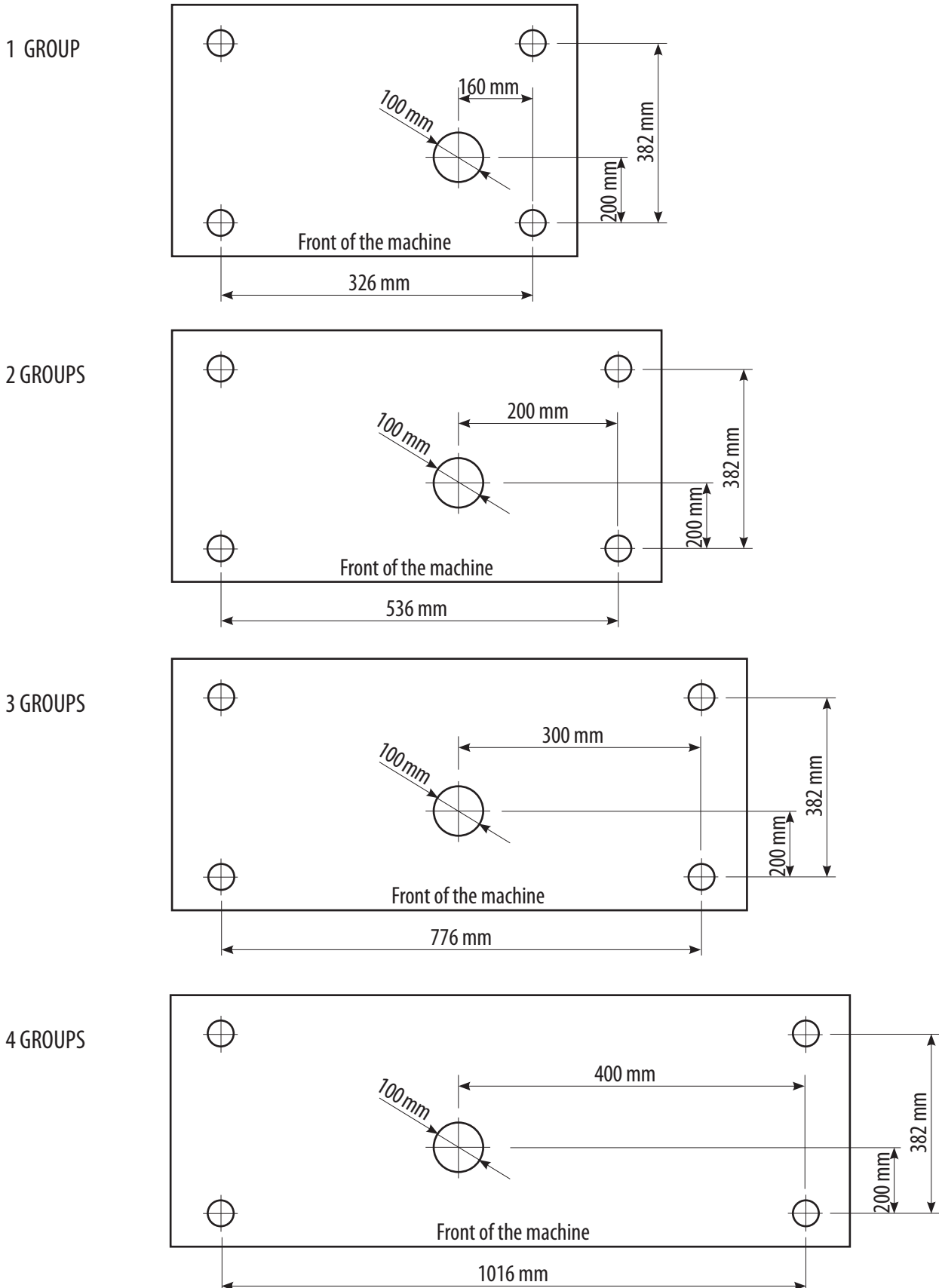
In case of installation of the machine within moving environments (trains, ships, etc.) it is necessary to use special anchor pins, which can be bought from the manufacturer, to the base.



- | | |
|--|---|
| 1. Support base | 14. Motor pump outlet |
| 2. Grinder-dispenser | 15. Water supply tap |
| 3. 20 cm minimum distance between the machine and the wall | 16. Water supply non-return valve |
| 4. Discharge tub | 17. Used coffee grounds drawer |
| 5. Boiler water level | 18. Support for tapping the filter holder |
| 6. Water supply inlet | 19. Height of support base 90 cm |
| 7. Manual water load | |
| 8. Adjustable feet | |
| 9. Electric power switch | |
| 10. Water filter inlet | |
| 11. Water filter outlet | |
| 12. Sewer drain | |
| 13. Motor pump inlet | |

5.6 Drilling the support base

In the case where it is necessary to drill holes on the support bench for passing the water inlet and outlet hoses, as well as the electrical and gas supply cables, follow the directions in the drawings below.



5.7 Hydraulic connection

5.7.1 Water supply

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 owner/manager of the system must confirm to the installer that the water meets the requirements above:

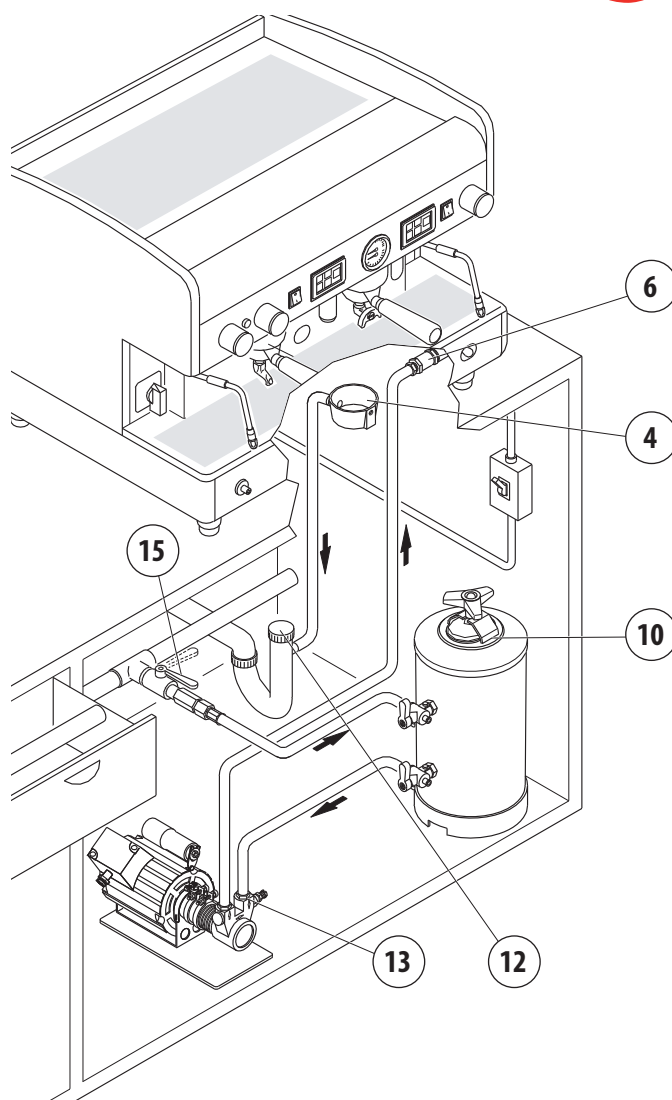
5.7.2 Materials to be used

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.

5.7.3 Hydraulic connections

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

1. Add a tap to the water supply so as to stop water from flowing to the machine;
2. in order to prevent damage, it is advisable to install the water purification filter where it will be protected from accidental blows;
3. if there is no water (10), and/or motor pump purification filter (13), connect the water supply (15) directly to the inlet of the machine (6);
4. when connecting the pad of the machine (4) to the sewer drain (12), avoid overly tight curves or kinks, and make sure that there is sufficient inclination for water to flow out of the drain;
5. the drain must be connected to an inspectable siphon that can be periodically cleaned, in order to avoid bad odors;
6. to avoid oxidization and damage to the machine over time, do not use iron connections for the hydraulic system, even if galvanized.



After installation and before using the machine, the water of the hydraulic circuits must be replaced, as indicated in par. 6.11 on page 33 .



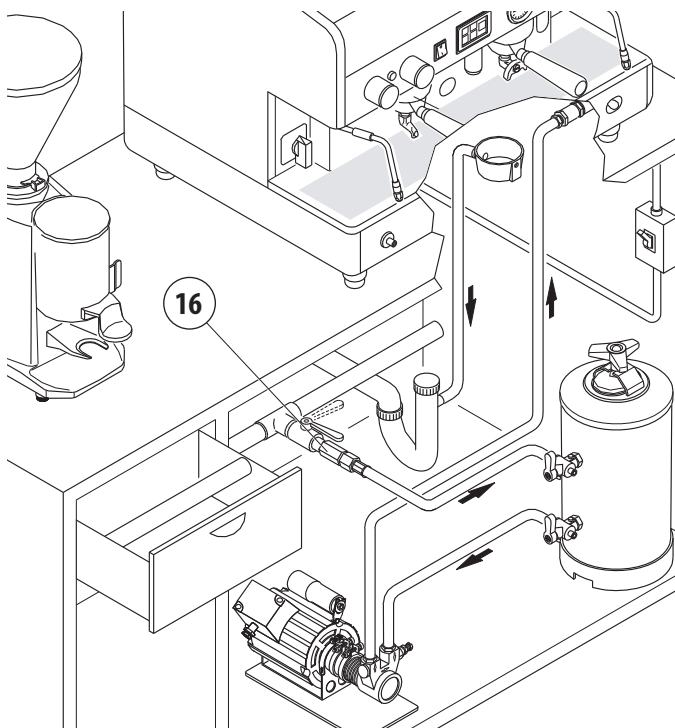
The water supply must provide cold water for human consumption (potable water) at a pressure between 1,5 and 5 bars. If the pressure is higher than 5 bar, connect a pressure reducer before the pump. All filling connections are 3/8 male gas type. The drain pan is connected to a tube with an internal diameter of 16 mm. If an external tank is used, the connection pipe between the machine and the tank must not exceed 150 cm. The machines are equipped with a time-limit switch that allows the water to fill the boiler only for a limited time. This function keeps water from flowing out of the boiler's valve (flooding) and keeps the motor pump from overheating.



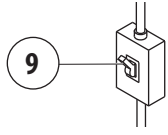
FOR THE EUROPEAN COMMUNITY: for the hydraulic connection to the water mains and also for connection to an external tank, it is necessary to place a non-return valve (16) up the line from the machine as set forth by standards EN 1717.

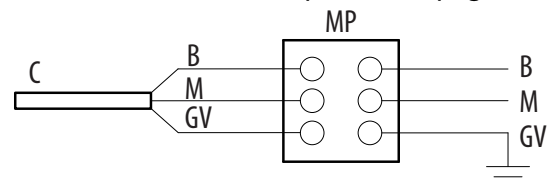


FOR THE U.S.A. - The water connections and discharges must be made in accordance with the 2003 International Plumbing Code of the International Code Council (ICC), or with the 2003 Uniformed Hydraulic Code of the IAPMO. The machine must be installed together with an adequate non-return valve, as required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



5.8 Electrical connection

- Installation must be done in accordance with the safety standards in force in the country of installation. The owner/manager of the system must confirm to the installer that the electrical system meets the requirements above.
- Install a general protection switch (9) as required by current safety regulations suitable to the rated power. 
- For the electrical connection of the machine, refer to Chap. 14 on page 47 .
- Do not use power extensions or electrical adaptors for multiple outlets. If their use is absolutely necessary, use only simple adapters and extensions complying with current safety standards. Never exceed the capacity value indicated on the adapter and the extension cord, and that the maximum power indicated on the adapter.
- The access spaces to the machine and main switch must be left clear, in order to allow the user to intervene without any constrictions and be able to leave the area immediately in case of necessity. If using an external motor pump, proceed as follows:
- Connect the motor pump cable (with smaller cross section) to the connector of the external motor as shown in the diagram below;
- connect the machine power cable (with larger cross section) as set forth in chapter 14 on page 47 .



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



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.

We recommend to promptly report to the Manufacturer any problems encountered during installation of the equipment.

5.9 Gas Connection (if required)

5.9.1 Requirements



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

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.



FOR ITALY

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



FOR GERMANY

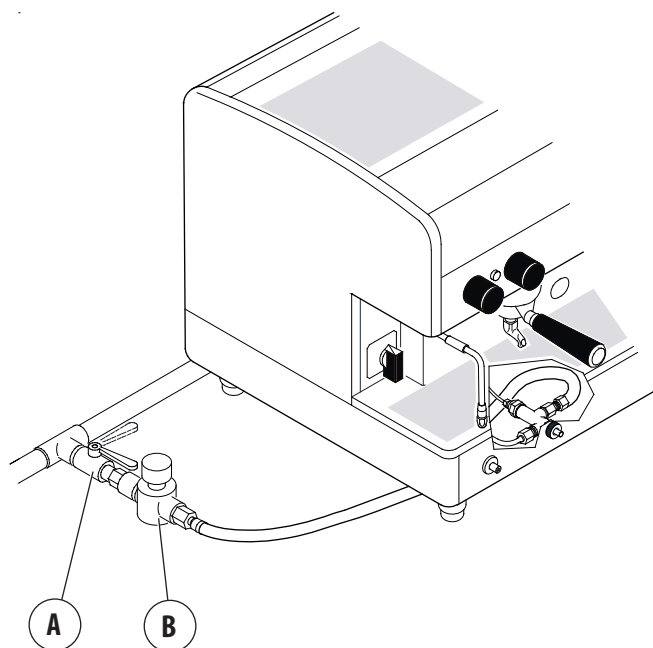
The following requirements must be observed for installation:

- Rules 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 stoves-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.

5.9.2 Gas system connection

To perform the connection of the gas system, proceed as follows:

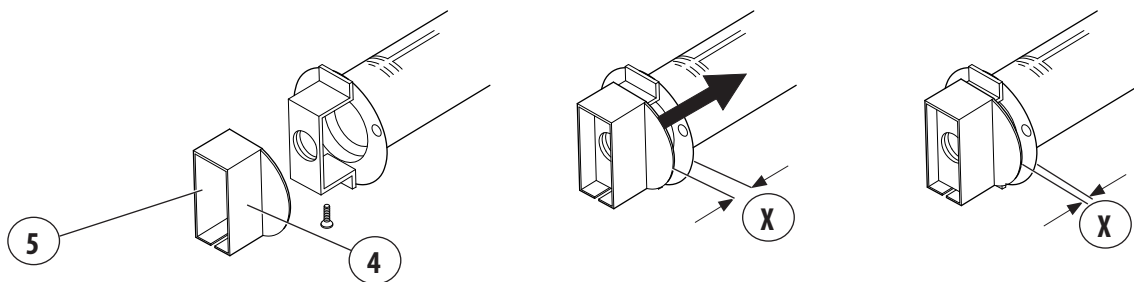
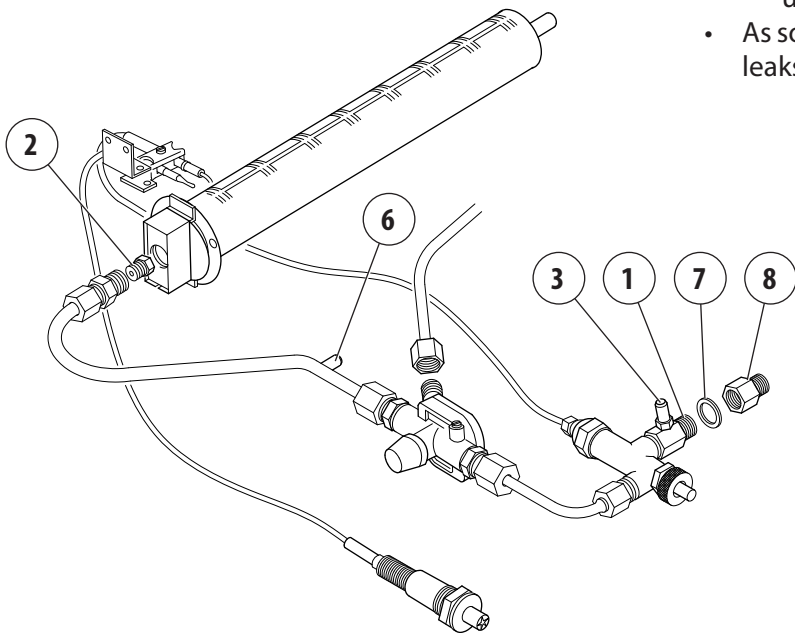
- Install a cut-off cock upstream of the machine (**A**);
- install a pressure reducer upstream of the gas system (**B**);
- pipe connections of the gas to the machine must be made in accordance with current standards in the country of installation using either a flexible or rigid hose.



- In case of connection with a hose, follow the indications below:
 - 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;
 - fix the hose to the connector (1) if necessary, install the conic connector (8) and its seal (7);
 - the hose must not be placed near potential heat sources, they must not reach a temperature higher than 50 °C.
 - the hose 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.



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).



- When connecting with a pipe: connect the Ø8 copper pipe 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 the case of a different gas, replace the injector (2) as indicated in the Gas Table in par. 5.9.3 on page 27 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 par. 5.9.4 on page 28 ;
- check that the air aspiration height (X) corresponds to that indicated in the Gas Table see par. 5.9.3 on page 27 ;
- to carry out any adjustments proceed as follows:
 - loosen the screw (4);
 - move the suction cap (5) to the required height;
 - fix 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.

5.9.3 Gas Table

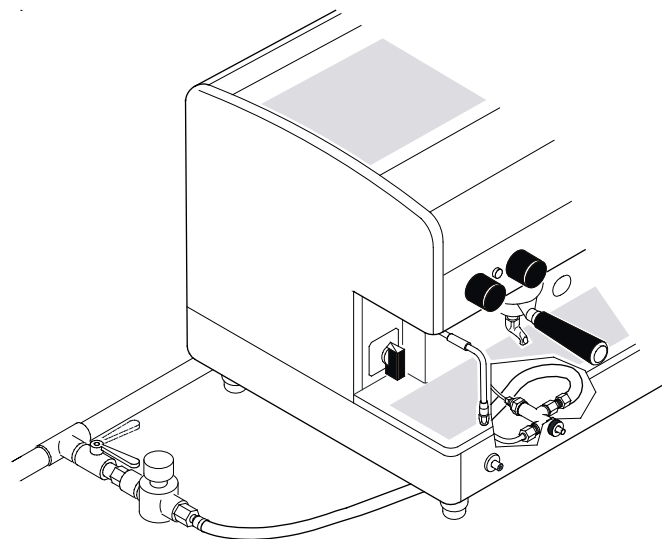
Indications for the installation of the appropriate injector and the adjustment of the air suction cap

	Gas type	Supply pressure	Injector inlet minimum pressure	Burner injector hole	Aspiration air cap adjustment	Minimum power Q min	Maximum power Q n	Maximum consumption	
MODEL:		mbar	mbar	1/100 mm	mm	Kw	Kw	m ³ /h	kg/h
1 Group	G20	20	1.7	100	1	0.47	1.67	0.177	-
	G25	20	1.7	110	1	0.47	1.67	0.177	-
	G25	25	2.4	100	1	0.47	1.55	0.164	-
	G30/31	28-30/37	3.5	60	3	0.47	1.40	-	0.110
	G30/31	50	3.5	60	3	0.47	1.80	-	0.142
2 Groups	G20	20	1.9	110	1	0.69	2.03	0.215	-
	G25	20	2.1	135	1	0.69	2.52	0.267	-
	G25	25	2.7	110	1	0.69	1.88	0.199	-
	G30/31	28-30/37	5.5	75	3	0.69	2.20	-	0.174
	G30/31	50	6.1	65	3	0.69	2.10	-	0.167
3 Groups	G20	20	2.3	135	1	1.16	3.06	0.323	-
	G25	20	2.3	145	1	1.16	2.91	0.308	-
	G25	25	3.5	135	1	1.16	2.85	0.302	-
	G30/31	28-30/37	6.1	80	3	1.16	2.51	-	0.199
	G30/31	50	11.3	75	3	1.16	2.84	-	0.225
4 Groups	G20	20	2.5	145	1	1.30	3.55	0.376	-
	G25	20	2.5	160	1	1.30	3.55	0.376	-
	G25	25	3.8	145	1	1.30	3.30	0.349	-
	G30/31	28-30/37	6.8	85	3	1.30	2.85	-	0.225
	G30/31	50	11.3	75	3	1.30	2.85	-	0.225

5.9.4 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;
4. wait for boiler pressure to reach 1.4 bar (see boiler 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 1.1-1.3 bar.



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

TO DECREASE PRESSURE

- set the minimum to 0.9 bar and the maximum to 1.3 bar. You will obtain pressure in the boiler of about 1.0 - 1.2 bar.

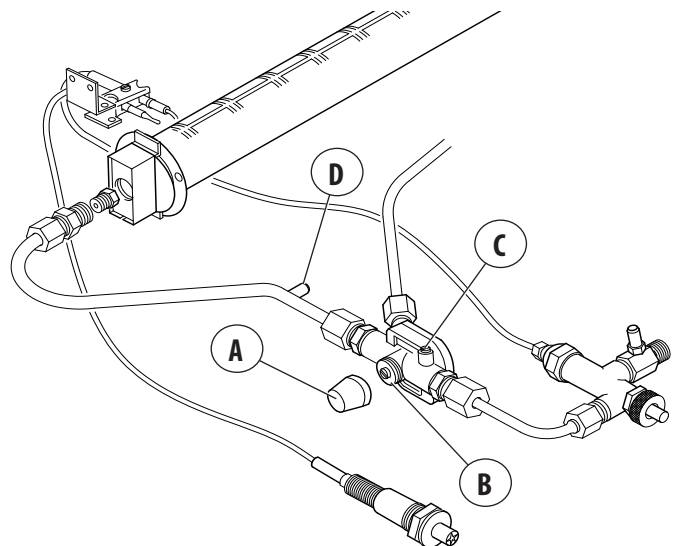
TO INCREASE PRESSURE

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

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






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.



6. COMMISSIONING

6.1 Safety precautions

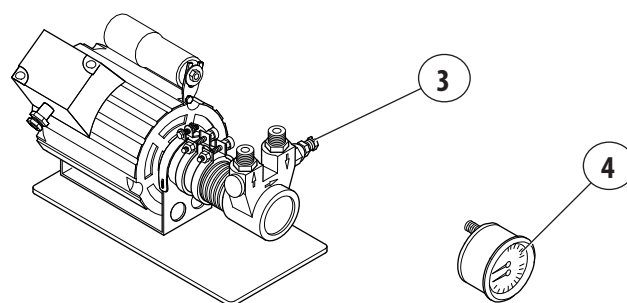
The following residual risks are present during the commissioning of the machine and cannot be eliminated:

	<p>Electrical hazard: When using the electrical appliance, several safety standards must be observed:</p> <ul style="list-style-type: none"> do not touch the appliance with wet or damp hands or feet; do not use the appliance if barefooted; do not pull the power cord to disconnect the appliance.
	<p>Danger of high temperature: Some parts of the machine can reach high temperatures:</p> <ul style="list-style-type: none"> avoid contact with the dispensing group and water spouts; do not expose your hands or other body parts to the coffee, steam, or hot water spouts.
	<p>Explosion hazard: If provided with gas system, pay special attention to:</p> <ul style="list-style-type: none"> When indoors, always provide vents. Check for gas leaks. 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.

6.2 External motor pump adjustment

To adjust operating pressure proceed as follows:

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



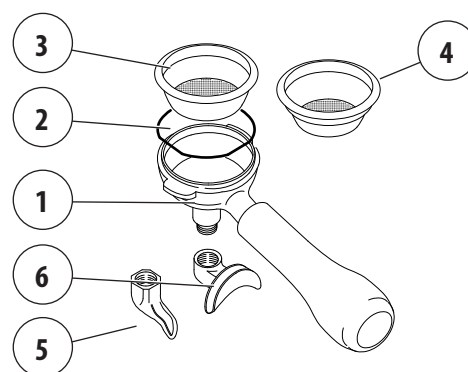
6.3 Preparing the filter holder

6.3.1 Filter holders

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

6.3.2 Spouts

Complete the filter holder by mounting the spout for one cup (5) or two-cup (6).



Properly connect the single filter with the single spout and the double filter with the double spout.

6.4 Coffee grinding

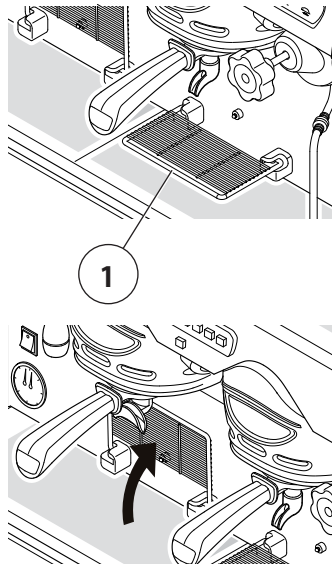
To adjust the coarseness of the ground coffee, use the appropriate regulator located on the hopper of the grinder-dispenser.

6.5 Cup raising grilles (if included)

When using cups of different heights, you can use the special flippable grilles (1) which the machine is equipped with.

To use the grille, disengage it from the stop and rotate it downward in a horizontal position.

When it is no longer needed, push it upwards, until latching it into place.



6.6 Lighting (if included)

6.6.1 Dispensing compartment

To turn on and turn off the work compartment lighting, press the switch, which is located under the command facade on the left side.

6.6.2 Sides

To turn the work compartment lighting on and off, press the switch, which is located under the command facade on the left side.

6.7 Cup heater (if included)

Activate and adjust the temperature as shown in the model-specific user manual.

6.8 Autosteamer (if included)

6.8.1 Temperature adjustment

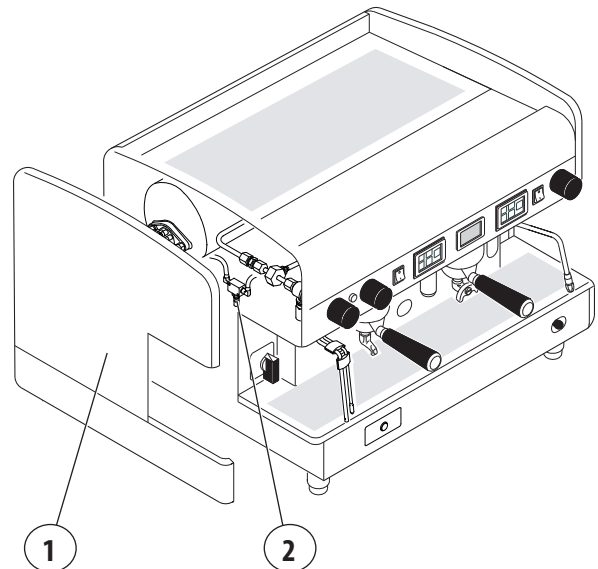
To program the temperature of the milk to be heated, enter the machine programming through the display and set the desired temperature.

However, we recommend not to exceed 60° C.

6.8.2 Milk foaming adjustment

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 the foam, turn clockwise;
 - to increase the foam, turn counter-clockwise;
3. place the side back (1) on the machine.

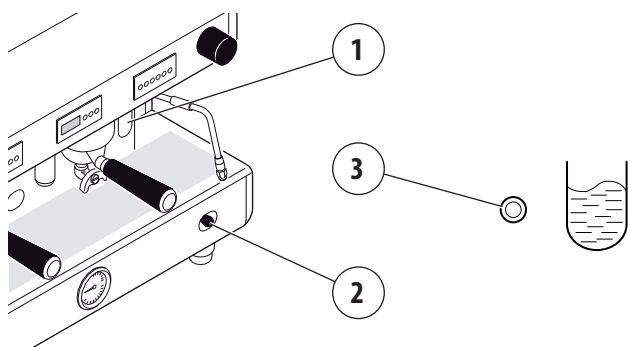


6.9 Machine first startup

6.9.1 AL-AEP-SAE versions first startup

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).

In some versions of the optical level is replaced by a green light (3): the light indicates the proper water level of the boiler, slow flashes indicate the phase of water loading.

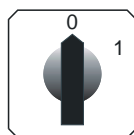


If there is no water (first installation or after boiler maintenance), it is necessary to fill the boiler in advance, so as to prevent overheating of the heating element.

Proceed as follows:

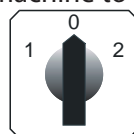
SWITCH

- Open the water supply tap;
- 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.



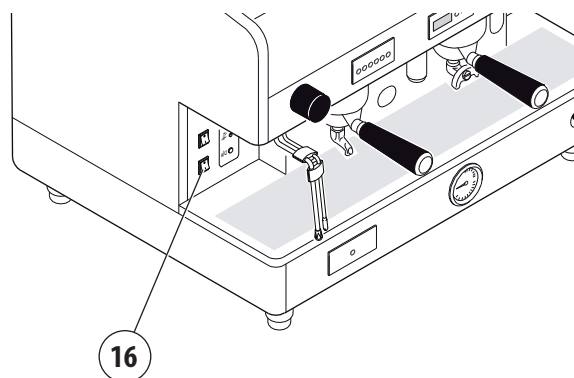
POWER SWITCH

- Open the water supply tap;
- turn the power switch to position "1" (electrical power supplied to the pump for automatic boiler replenishment 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.



6.9.2 Electric heating (DISPLAY versions)

- Press the machine's master switch (16);



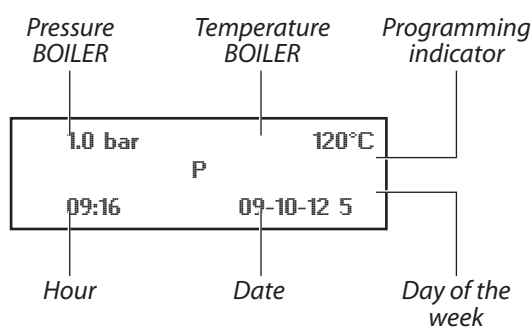
- Wait for the possible automatic replenishment of the water in the boiler;
- wait another second or so for the performing of the auto-test;

PLEASE WAIT
FUNCTIONAL TEST

TEST RESULTS
- OK -

- The machine is ready for use when the following message is displayed:

1.0 BAR 120°C
09:16 09-10-12 5



Day of week encoding

1	Monday	5	Friday
2	Tuesday	6	Saturday
3	Wednesday	7	Sunday
4	Thursday		



If the temperature is lower than 90 °C (heating up phase), on the display appears LOW.

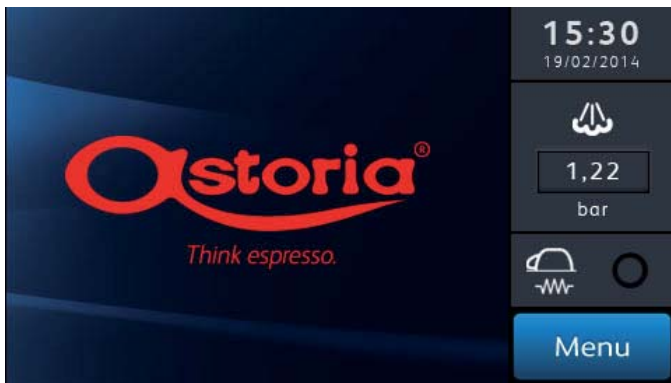
To put the machine back in service press again the keys simultaneously for 3 seconds.

6.9.3 Electric heating (Display Touch versions)

- Open the water supply tap;
- Press the machine's main switch (1);
- wait another second or so for the performing of the auto-test;
- wait for the automatic filling of water in the boiler and the heating of the machine;



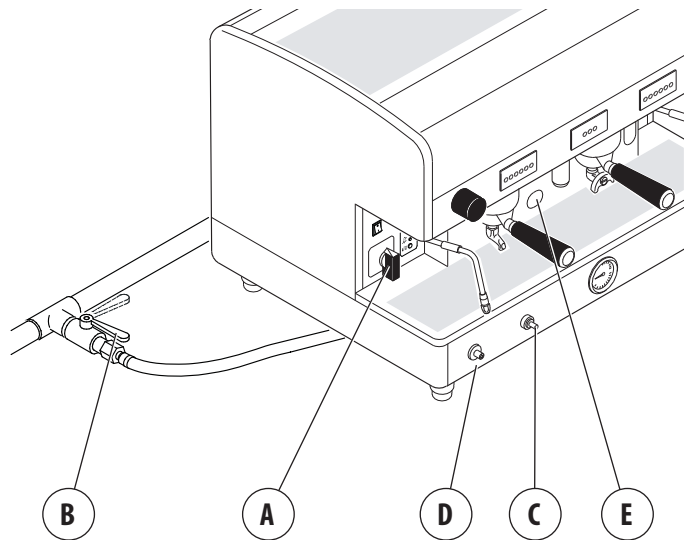
- The machine is ready for use when the following message is displayed:



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.

6.9.4 Gas heating (where included)

- Turn the power switch (A) to position 1;
- open the gas valve (B) on the mains;
- hold down the push button (C) and, at the same time, press the on button (D). Once the flame ignites, hold down knob (C) for a few seconds, to allow proper activation of the thermocouple;
- then check through the window (E) that the flame has ignited;
- wait for the operating pressure indicated on the pressure gauge to reach a working value of 1-1.2 bar;



6.9.5 Electric heating (if included)

- Proceed as indicated in the previous paragraph
- after checking that the flame has ignited, turn the main switch (A) to position 2. In this way the boiler heating element is powered and operating pressure will be reached more quickly;
- wait for the operating pressure indicated on the pressure gauge to reach the working value of 1-1.2 bar;



Do not operate the gas system when the boiler is empty.

6.10 Machine shutdown

Turn off the machine using the main switch or power switch.

6.11 Water replacement

During the installation of the machine, the Qualified Technician must replace the water contained in the hydraulic circuits by following these steps:

- 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 reaching the "ready to operate" condition, the following has to be performed:
 - for each coffee unit, carry out continuous dispensing, 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 dispensing 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.



If the machine remains inactive for a time longer than 1 week, the Qualified Technician must renew 100% of the water contained in the hydraulic circuit, as indicated above.



- **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 dispensing 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;**
- **during dispensing of coffee, do not remove the filter holder from the brewing.**

7. PROGRAMMING

For programming the machine, follow the provisions in the user's manual.

8. MAINTENANCE AND CLEANING

8.1 Safety precautions

Perform only the maintenance and cleaning operations described in this manual.

If the problem cannot be solved, turn the machine off and contact the Manufacturer.

All maintenance operations must be carried out after disconnecting the power, water, and gas supply (if included) after the complete cooling of the machine.

After maintenance and/or repair intervention, the components used must ensure that the hygiene and safety requirements initially provided for the appliance are still met. These are met by using original spare parts only. After repair or replacement of components related to parts in direct contact with water and food, a washing procedure has to be carried out, as in the case of first installation.

The following residual risks are present during the maintenance and cleaning of the machine and cannot be eliminated:

	<p>Electrical hazard: The maintenance and cleaning operations are subject to the behavioral safety rules:</p> <ul style="list-style-type: none"> • do not carry out the maintenance with the machine in operation; • do not soak the machine in water; • do not spill liquids on the machine or use water jets for cleaning; • do not to allow the maintenance and cleaning operations to be carried out by children or incapacitated people; • do not perform maintenance and cleaning operations other than those described in this manual.
	<p>Danger of high temperature: During the cleaning operations, pay attention to the parts of the machine that can become overheated.</p> <ul style="list-style-type: none"> • avoid contact with the dispensing group and water spouts; • do not expose your hands or other body parts to the coffee, steam, or hot water spouts.
	<p>Explosion hazard: If provided with gas system, pay special attention to:</p> <ul style="list-style-type: none"> • When indoors, always provide vents. • Check for gas leaks. • 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.

8.2 DPI characteristics

During maintenance and cleaning of the machine, the following PPE are required:

	Mandatory use of protective gloves
---	------------------------------------

8.3 Maintenance

8.3.1 Scheduled maintenance

Perform the following maintenance according to the specified frequency.

In case of intensive use of the machine the checks need to be performed in smaller intervals.

Component	Type of intervention	Quarterly	Yearly
GAUGE	Check the boiler pressure, which must be between 0.8 and 1.4 bar. Periodically check water pressure during coffee dispensing: check the pressure indicated on the gauge, which must be between 8 and 9 bar inclusive.	X	
FILTERS and PORTAFILTERS	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 and replace filters and/or filter holders, as required.	X	
DISPENSING UNIT	Replace the perforated disk and under cup seal, as indicated in par. "8.3.3 Dispensing group maintenance" on page 36 .	X	
WATER FILTER	Replace the water filter cartridge at the frequency indicated by the manufacturer. The presence of scale in the hydraulic system indicates the need for its replacement.	X	
WATER SOFTENER	Carry out the regeneration as indicated by the Manufacturer. Use care in areas where the water is very hard. It will be necessary to regenerate at more frequent intervals, especially in case of intensive use of the machine.	X	
GRINDER-DOSER	Check the ground coffee dose (about 7 grams per time); 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. We recommend calling the Qualified Technician to replace the flat grinders after every 400/500 kg of coffee. For conical grinders, replace every 800/900 kg.	X	
BOILER	Replace the water in the boiler as indicated in par. 6.11 on page 33 .	X	
BOILER	Replace the heating element in case of failure or malfunctioning. Do not replace the heating element with a more powerful one. Before making any changes, contact the Manufacturer. If the thermostat of the heating element is triggered, reset it by pressing the central button of the thermostat. However, before trying to operate the machine, verify the causes of the problem. If the boiler insulation needs to be removed, restore the insulation after maintenance Remove and clean the boiler level probes. Check for lime scale deposits on the heating element, on the exchanger (inside and out). A strong presence of limestone indicates that the water filter has not been replaced, or that the softener has not been regenerated. When replacing any components, always replace the relative gasket as well.		X
SAFETY VALVE SCNR VALVE NEGATIVE PRESSURE VALVE	Check that the safety valves, non-return drain valves, and pressure valves are operating properly, as indicated in par. - 8.3.5 - 8.3.6 on page 36 . If their replacement becomes necessary due to failure, repeat the check with the new valve installed.		X

Component	Type of intervention	Quarterly	Yearly
HYDRAULIC CIRCUIT	Verify the presence of lime scale deposits in the hydraulic circuit. When replacing any components, always replace the relative gasket as well. A strong presence of limestone in the hydraulic circuit of the machine indicates that the water filter has not been replaced, or that the softener has not been regenerated. Use care in areas where the water is very hard. It will be necessary to replace the water filter more frequently, or regenerate the softener at more frequent intervals, especially in case of intensive use of the machine.		X
DRAIN	Check for any leaks on the hydraulic and sewer connections. Check the state of the drain pan and the drain connection tube.		X
DISPENSING UNIT	Check the condition of the solenoid valve of the dispensing group.		X
GAS SYSTEM	Check for gas leaks with a suitable gas detection instrument, or by passing a soapy solution on all the gas fittings.		X
WATER AND STEAM NOZZLES	Check the condition of the nozzles and clean the sprayer.		X
DISPENSER	Check and clean the volumetric dispenser by removing any oxidation from the terminals.		X
PRESSURE GAUGE AND PRESSURE SWITCH	Check for proper operation of the pressure gauge and pressure switch.		X
ELECTRIC SYSTEM	Check and clean the volumetric dispenser by removing any oxidation from the terminals.		X
TOUCH SCREEN	Check the proper operation of the touch screen and possibly adjust the parameters. View the machine counts and check the performed work cycles.		X
MOTOR PUMP	Visually inspect the machine wires conditions		X



Any action taken on the electronics of the machine when still connected to the power, automatically invalidates any guarantee.



On the internet site of the Manufacturer all original spare parts are available. The Manufacturer may provide the list of spare parts recommended for the maintenance of the various versions of the machine.

8.3.2 Maintenance after a short period of inactivity

"Short machine downtime" refers to a period of time exceeding one working week.

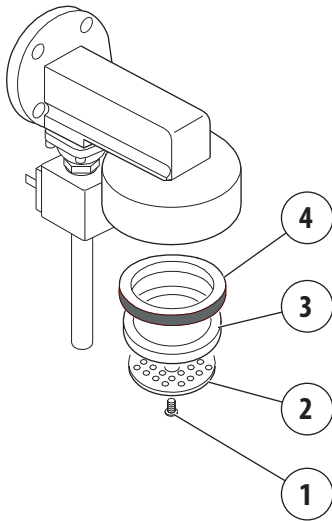
When reactivating the machine after this period, the Qualified Technician must change completely the water contained in the hydraulic system, as specified in paragr. "6.11 Water replacement" on page 33.

Furthermore, all operations envisaged for the scheduled Maintenance must be carried out, see previous paragraph.

8.3.3 Dispensing group maintenance

Every 3 months replace the perforated disk (2) and the undercup seal (4) of the dispensing group (use only original spare parts) proceeding as follows:

- loosen the screw (1);
- remove the containment ring (3);
- replace the group perforated disk (2) and the rubber undercup seal (4);
- reassemble the components



8.3.4 SAFETY VALVE check

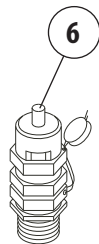
The Pressure relief valve is one of the main components for the machine safety. Therefore, it is important to carry out the following checks:

First check:

- Remove the top grill of the machine;
- use pliers to pull the pin of the valve (6) upwards;
- if the pin does not move, it probably means the valve is encrusted with limestone and must be replaced.

Second check:

- 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 1.9 bar.



If you notice any malfunction, replace the valve. Use only the Manufacturer's original Safety Valves.

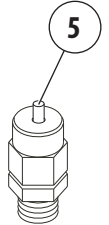
8.3.5 PRESSURE VALVE check

First check:

- Remove the top grill of the machine;
- use pliers to push the pin (5) downwards;
- if the pin does not move, it probably means the valve is encrusted with limestone and must be replaced.

Second check:

- 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.

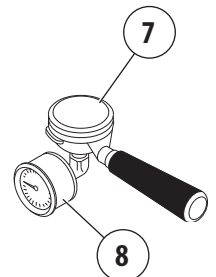
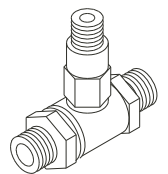


If you notice any malfunction, replace the valve.

8.3.6 NON-RETURN DRAIN VALVE check

The not-return drain valve is an important component for the correct operation of the machine. Perform the check as follows:

- Activate the dispensing groups for about 30 seconds;
- attach a filter holder (7) with a gauge (available on request) to the dispensing group;
- activate the dispensing group, and use the pressure gauge (8), to monitor the pressure as it increases up to 8-9 bar;
- check the increase in the pressure due to the expansion of the heated water up to a value of approximately 12 bar: reaching this value confirms proper operation of the valve, as well as of the gaskets and solenoid valves seal;
- deactivate the deliveries;
- check the other dispensing groups.



If you notice any malfunction, replace the valve.

8.4 Malfunctions and solutions

Problem	Cause	Action
MACHINE LACKING POWER	<ul style="list-style-type: none"> The general switch is in the "OFF" position. The machine switch is defective The mains power supply switch is in the OFF position. The wiring is defective 	<ul style="list-style-type: none"> Place the main switch in the "ON" position. Replace the main switch. Place the main switch in the ON position. Check for any faulty connections.
NO WATER IN BOILER	<ul style="list-style-type: none"> The water supply tap is closed. The cut-off tap of the automatic level device is closed. The pump filter is clogged. The motor pump is disconnected or jammed. The water filling solenoid valve is defective. The water inlet solenoid valve filter is clogged. 	<ul style="list-style-type: none"> Open the water supply tap. Open the automatic level device tap. Substitute the pump filter. Check the motor pump. Replace the water filling solenoid valve. Clean or replace the filter of the solenoid valve.
TOO MUCH WATER IN THE BOILER	<ul style="list-style-type: none"> The solenoid valve of the automatic level device is defective The level probe is out of order (clogged by lime scale) 	<ul style="list-style-type: none"> Replace the solenoid valve of the automatic level device. Replace the level probe.
WATER LEAKS FROM THE MACHINE	<ul style="list-style-type: none"> The pad does not drain. The drain pipe is broken or detached or the water flow is obstructed. Hydraulic leaks in the hydraulic circuit. 	<ul style="list-style-type: none"> Check the sewer drain. Check and restore the connection of the drain pipe to the pad. Restore the hydraulic seal by replacing the pipe, the gasket or the fitting as necessary.
WATER LEAKS FROM THE DISPENSING GROUP	<ul style="list-style-type: none"> Worn under cup seal 	<ul style="list-style-type: none"> Replace the seal.
THE PRESSURE GAUGE INDICATES AN UNACCEPTABLE PRESSURE	<ul style="list-style-type: none"> The pressure gauge is faulty. Incorrect pressure switch calibration. Incorrect motor pump calibration. 	<ul style="list-style-type: none"> Replace the gauge. Adjust the calibration of the pressure switch Adjust the calibration of the motor pump.
THE SAFETY VALVE STARTED OPERATING	<ul style="list-style-type: none"> The pressure transducer is broken. The electronic control is faulty. 	<ul style="list-style-type: none"> Check for correct operation of the pressure transducer. Replace the safety valve only with original spare part. Check for proper operation of the electronic system.
STEAM DOES NOT COME OUT OF NOZZLES	<ul style="list-style-type: none"> The machine is off. The electrical heating element is faulty. The temperature probe is faulty. The nozzle sprayer is clogged. Safety thermostat deactivated or faulty. 	<ul style="list-style-type: none"> Turn on the machine. Replace the boiler's electrical heating element. Replace the temperature probe. Clean the steam nozzle sprayer. Reactivate the thermostat or replace it.
STEAM MIXED WITH WATER COMES OUT OF THE STEAM SPOUTS	<ul style="list-style-type: none"> The level of the boiler is too high due to an incorrect location of the level probe in the boiler or due to the presence of limestone. Leakage from boiler filling solenoid valve. 	<ul style="list-style-type: none"> Check the status of the level probe: check if it is positioned correctly and check for any surface lime scale. Clean and replace the filling solenoid valve.
NO COFFEE DISPENSING	<ul style="list-style-type: none"> No water supply. The group solenoid valve is faulty. The pump is jammed. The group solenoid valve is clogged or dirty. The group filter is clogged. The volumetric dosing device is blocked. The inlet and outlet taps of the dispenser are closed. 	<ul style="list-style-type: none"> Check that there is water in the mains. Replace the group solenoid valve. Replace the pump. Clean or replace the solenoid valve. Clean or replace the filter. Check/replace the dosing device. Open the taps.
WET COFFEE GROUNDS	<ul style="list-style-type: none"> The group solenoid valve drain is clogged. The dispensing unit is too cold Coffee is ground too finely. There's not enough ground coffee. 	<ul style="list-style-type: none"> Clean the group drain. Wait for unit to heat up completely. Adjust the grinding of the coffee. Increase the amount of ground coffee.

Problem	Cause	Action
GROUNDS IN CUP	<ul style="list-style-type: none"> The filter holder is dirty. The filter holes are worn. The coffee is not ground evenly. The seal under the pad is worn The pressure in the pump is too high. 	<ul style="list-style-type: none"> Clean the filter holder. Replace the filter. Replace the grinders. Replace the seal. Adjust the pressure of the pump
THE CUP IS DIRTY WITH SPLASHED COFFEE	<ul style="list-style-type: none"> Steam pockets in the dispensing system. Air pockets in the hydraulic circuit. Coffee is ground too coarsely 	<ul style="list-style-type: none"> Reduce the water temperature. Check the cause and eliminate the problem. Adjust the grinding suitably.
COFFEE IS TOO COLD	<ul style="list-style-type: none"> The electrical heating element of the coffee boiler is faulty. The wiring is faulty. Lime scale on the exchangers and/or heating element. The pressure switch contacts are oxidized. The heating element protection thermostat intervened. Machine switch in "1" position In the CTS system, the lime scale has reduced the circulation of water The dispensing group is cold. 	<ul style="list-style-type: none"> Replace the boiler's electrical heating element. Check for any faulty connections. Clean the machine. Clean the contacts or replace the pressure switch. Reset the heating element protection. Place the machine switch in the "2" position Clean the connections of the exchanger, and clean or replace the two circulation tubes Eliminate air pockets in the hydraulic circuit in the following manner: <ul style="list-style-type: none"> disconnect the pump from the power supply; close the water tap of the softener; perform a dry dispensing run for a few minutes; connect the pump to the power supply; open the water outlet tap of the softener; dispense until water comes out; wait a few minutes for heating.
COFFEE IS TOO HOT	<ul style="list-style-type: none"> Boiler temperature is too high. The flow reducer of the group is not suitable 	<ul style="list-style-type: none"> Reduce the pressure in the boiler using the appropriate screw on the pressure switch. Replace the reducer with one of a smaller diameter.
COFFEE IS BEING DISPENSED TOO QUICKLY	<ul style="list-style-type: none"> Coffee is ground too coarsely The diameter of the injector is too large. The dose of ground coffee is too small. 	<ul style="list-style-type: none"> Adjust the grinding of the coffee. Replace the injector with one of a smaller diameter. Check the amount (grams) of the ground coffee you are using.
COFFEE IS BEING DISPENSED TOO SLOWLY	<ul style="list-style-type: none"> Coffee is ground too finely. The injector is clogged. The dispensing group is clogged. The filter holder is dirty. 	<ul style="list-style-type: none"> Adjust the grinding of the coffee. Replace the injector. Check and clean the dispensing group. Clean and replace the filters, if necessary.
SAE version: SHUTDOWN OF THE ELECTRONIC SYSTEM	<ul style="list-style-type: none"> The control unit fuse is burned out. One of the volumetric dispenser's contacts is grounded. 	<ul style="list-style-type: none"> Replace the main fuse (125 mA). Check the connection of the volumetric dispenser.
SAE version: COFFEE DISPENSING OCCURS ONLY USING THE MANUAL BUTTON	<ul style="list-style-type: none"> The control unit fuse is burned out. The coil of the solenoid valve does not work correctly or has shorted out. 	<ul style="list-style-type: none"> Replace the control unit fuse (1A). Replace the coil of the solenoid valve.
SAE version: SHUTDOWN OF THE ELECTRONIC SYSTEM	<ul style="list-style-type: none"> The control unit fuse is burned out. One of the volumetric dispenser's contacts is grounded. 	<ul style="list-style-type: none"> Replace the main fuse (125 mA). Check the connection of the volumetric dispenser.

Problem	Cause	Action
<p>SAE version:</p> <p>COFFEE DISPENSING IS NOT CONFORMANT</p> <p>THE COFFEE DOSE IS NOT MET</p> <p>THE LED OF THE DOSE BUTTON FLASHES</p>	<ul style="list-style-type: none"> The connection of the volumetric dosing device is faulty. The connection of the electronic control unit is faulty. The connector of the volumetric dosing device has humidity on it. The volumetric dispenser is faulty: the LED does not flash during dispensing. The coffee is ground too finely: there is not sufficient water flow in the dispenser. The non-return valve loses pressure (the dose is too small). The expansion valves lose pressure (the dose is too small). Water leakage from the group solenoid valve during coffee dispensing or when in stand-by. The volumetric dosing device is partially obstructed. 	<ul style="list-style-type: none"> Check for proper connection of the volumetric dosing device connector. Check for proper connection of the 8/10-pin connector of the electronic control unit. Remove the connector of the volumetric dosing device and thoroughly dry the contacts. Replace the heads of the volumetric dosing device or replace the dosing device. Adjust the grinding suitably and check the grinders, if necessary. Check and replace the non-return valve, if necessary. Check and replace the expansion valves, if necessary. Clean and replace the solenoid valve, if necessary. Clean or replace the volumetric dosing device.
<p>SAE version:</p> <p>ALL LEDS OF ALL THE PUSH BUTTON PANELS ARE FLASHING</p> <p>AEP version:</p> <p>THE FRONT LED IS FLASHING</p>	<ul style="list-style-type: none"> After a few minutes, automatic water filling is stopped. The device is in time-out. There is no water in the mains The tap for the automatic level device is closed. Some of the hoses in the circuit are clogged. The probe and/or the mass are disconnected. 	<ul style="list-style-type: none"> Turn the machine off and then back on. Open the water supply tap. Open the automatic level device tap. Check and replace the defective hoses. Check and restore the connections.
<p>NON-UNIFORM MILK DISPENSING FROM THE CAPPUCCINO MAKER</p>	<ul style="list-style-type: none"> Out of milk Milk injector obstructed. Cappuccino maker obstructed. Suction pipe clogged. Silicone tube detached. 	<ul style="list-style-type: none"> Refill milk. Clean the milk injector. Clean the cappuccino maker with the brush. Clean the milk suction hose. Connect the hose correctly.
<p>AIR POCKETS IN THE MILK FOAM FROM THE CAPPUCCINO MAKER</p>	<ul style="list-style-type: none"> Air regulator too open. Air aspiration tube disconnected from the cappuccino maker. 	<ul style="list-style-type: none"> Properly calibrate the air regulator. Restore the connection through the hose.
<p>THE PUMP WORKS ONLY WITH THE MANUAL DISPENSING BUTTON</p>	<ul style="list-style-type: none"> The pump fuse of the electronic control unit is burned out. 	<ul style="list-style-type: none"> Replace the pump fuse of the electronic control unit (10A).
<p>COFFEE DISPENSING IS NOT CONFORMANT</p> <p>THE COFFEE DOSE IS NOT MET</p>	<ul style="list-style-type: none"> The connection of the volumetric dosing device is faulty. The connection of the electronic control unit is faulty. The connector of the volumetric dosing device has humidity on it. The volumetric dosing device is faulty: during dispensing, the dosing device LED does not flash. The coffee is ground too finely: there is not sufficient water flow in the dosing device. Water leakage from the group solenoid valve during coffee dispensing or when in stand-by. The volumetric dosing device is partially obstructed. 	<ul style="list-style-type: none"> Check for proper connection of the volumetric dosing device connector. Check for proper connection of the electronic control unit connector. Remove the connector of the volumetric dosing device and thoroughly dry the contacts. Replace the heads of the volumetric dosing device or replace the dosing device. Adjust the grinding suitably and check the grinders, if necessary. Clean and replace the solenoid valve, if necessary. Clean or replace the volumetric dosing device.
<p>BUBBLES IN MILK FROTH</p>	<ul style="list-style-type: none"> Air regulator too open. Air aspiration tube disconnected from the cappuccino maker. Excessive temperature in foamed milk. 	<ul style="list-style-type: none"> Properly calibrate the air regulator. Restore the connection through the hose. Reduce the temperature of the foamed milk, increase the speed of the milk pump.



If the problem cannot be solved, turn the machine off and contact the Manufacturer.

8.5 Water filter maintenance

8.5.1 Water hardness detection

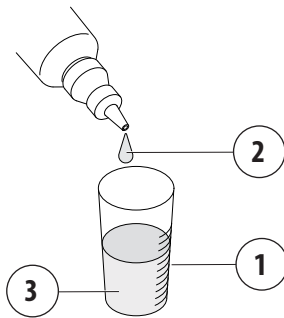
As part of the filter maintenance, it is advisable to test the water beforehand.

To identify the carbonate hardness of the water use the kit specified as follows:

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

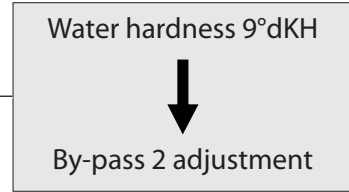
1 DROP = 1°dKH

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



8.5.2 By-pass configuration

Depending on the hardness of the water, adjust the by-pass of the water filter as shown in the table below. Example:



Water hardness (°dKH)	Bypass adjustment	Filter capacity (liters)			
		V	M	L	XL
4	3	6,250	9,500	13,000	17,000
5	3	5,000	7,600	10,400	13,600
6	3	4,165	6,330	8,665	11,330
7	3	3,570	5,425	7,425	9,710
8	2	3,125	4,750	6,500	8,500
9	2	2,775	4,220	5,775	7,555
10	2	2,500	3,800	5,200	6,800
12	1	1,865	2,835	3,885	5,080
14	1	1,600	2,430	3,330	4,355
16	0	1,185	1,800	2,465	3,220
20	0	945	1,440	1,970	2,575
24	0	790	1,200	1,640	2,145
≥ 25	0	≤ 755	≤ 1,150	≤ 1,575	≤ 2,060



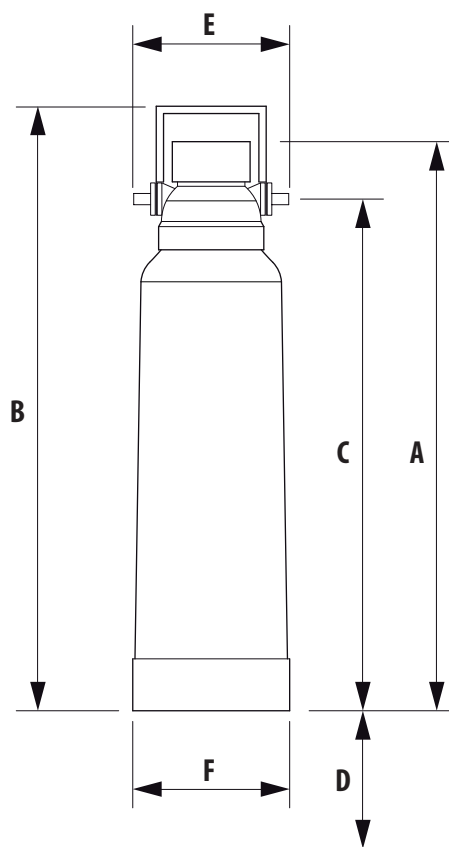
The values indicated in the table may vary, depending on the filter cartridge type used.

To adjust the by-pass, push the button (5) and turn.



8.5.3 Technical data

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



Replace the water filter cartridge at the frequency indicated by the manufacturer.



For the water filter use and maintenance, follow the indications by the manufacturer.

8.6 Softener regeneration

It is very important to regenerate the softener within the established times. The regeneration is to be done regularly every 15 days. However, in locations where water is very hard, it will be necessary to regenerate it more frequently. The same is true of places in which there is a large consumption of hot water for tea or other uses:

Proceed as follows:

- Move levers **(B)** and **(E)** from left to right;
- remove the lid by loosening the knob **(A)**;
- release enough water through the pipe **(C)** to make room for the 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 cover back in place by screwing the knob **(A)** down securely and move the lever **(B)** back from right to left;
- let the salt water drain from the little hose **(D)** until the water is no longer salty (about 30-60 minutes). The salt allows the accumulated mineral salts to be released;
- switch the lever **(E)** from right to left back to its initial position.



The build-up of lime scale in the hydraulic circuit and boiler inhibit thermal exchange, thus compromising proper operation of the machine. Heavy incrustations 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 regenerate it regularly, based on use of the softener and hardness of the water used. The table below shows the quantity of softened water based on the hardness of the water in the various units of measure:

- °f: French degree
- d°: German degree = 1.8 °f
- mg CaCO₃

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

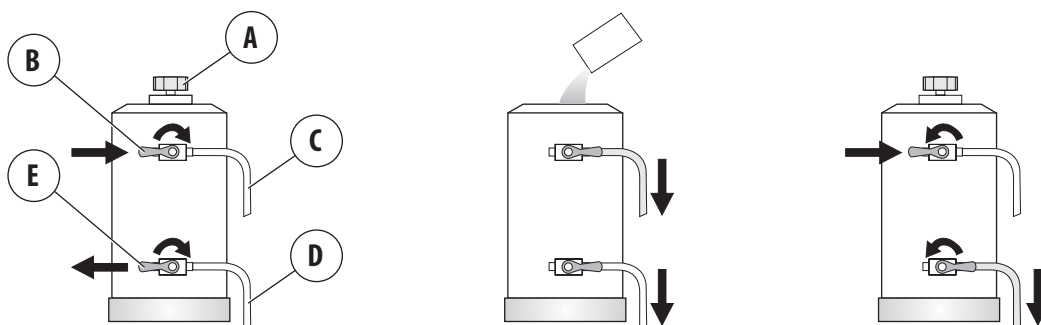
Amount of softened water based on hardness

°f	30	40	60	80	salt
°d	16.5	22	33	44	
mg CaCO ₃	30	40	60	80	
8 litres	1000 litres	900 litres	700 litres	500 litres	1.0 kg
12 litres	1500 litres	1350 litres	1050 litres	750 litres	1.5 kg
16 litres	2100 litres	1800 litres	1400 litres	1000 litres	2.0 kg

Softener model	Amount of salt
8 litres	1.0 kg
12 litres	1.5 kg
16 litres	2.0 kg



For the softener use and regeneration, follow the indications by the manufacturer.



8.7 Cleaning operations

8.7.1 General instructions

For perfect hygiene and efficiency of the unit, a few simple cleaning tasks are required. 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.



Do not use alkaline detergents, solvents, alcohol or aggressive substances. The used products/detergents have to be suitable for this purpose and must not corrode the materials of the hydraulic circuits.

Do not use abrasive detergents which may scratch the surface of the body.

Always use perfectly clean and hygienic cloths for cleaning.

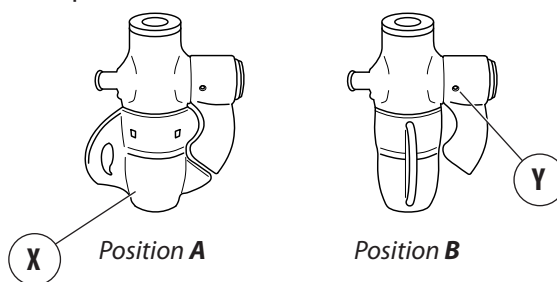
For washing the filters, filter holders and all machine components, use detergents supplied by the Manufacturer or specific products for cleaning professional coffee machines.

Cleaning	Daily	Weekly
Cappuccino maker: Clean at least once a day or more often in the case of a continued use of the cappuccino maker, following the instructions of par. 8.7.2 on page 43.	X	
Body and Grilles: Clean the panels of the body with a cloth dampened in lukewarm water. Remove the drip tray and cup holder grille and wash with hot water.	X	
Filter and filter holder: Wash the filters and filter holders daily and weekly, as indicated in par. 8.7.3 on page 43.	X	X
Steam nozzle: Keep the spout clean at all times using a cloth dampened in lukewarm water. Check and clean the ends of the spout, clearing the steam outlet holes with a small needle. Weekly wash as described in par. 8.7.7 on page 45.	X	X
Dispensing group: Wash the dispensing group as described in par. 8.7.4 or 8.7.5. Wash the components weekly as described in par. 8.7.6 on page 45.	X	X
Grinder-dispenser and Hopper Clean the hopper and the dispenser inside and out with a cloth dampened with warm water. When finished, dry all parts thoroughly.		X

8.7.2 Cappuccino-maker wash

Use special care in cleaning the cappuccino maker, following the procedures indicated below:

- perform a first wash by immersing the suction tube in water and dispense for a few seconds;
- turn the rotating body (X) 90° to position B (closure of milk outlet duct);
- holding the milk suction tube in the air, dispense steam (cappuccino maker dry run);
- wait about 20 seconds to allow for internal cleaning and sterilisation of the cappuccino maker;
- close the steam and put the rotating body back in position A;
- if the air intake hole (Y) is blocked, clear it gently with a pin.



Clean the cappuccino maker after each continuous use and at least once a day.

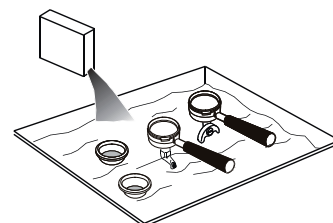
8.7.3 Filter and filter-holder cleaning

Daily:

- Soak the filter and filter-holder in hot water so that the fatty coffee deposits can dissolve;
- rinse with lukewarm water.

Weekly:

- Use a screwdriver to detach the filter from the filter holder;
- Soak the filter and filter holder in warm water and cleaning agent for 10 minutes.
- rinse with lukewarm water.



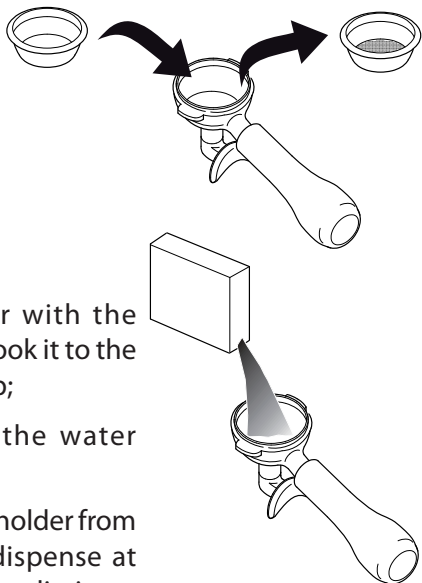
Caution: Only immerse the filter holder cup, avoid soaking the handle in water.

The detergent must be diluted in cold water in the doses indicated on the package (see manufacturer).

8.7.4 AEP version dispensing group wash

Wash the dispensing groups daily as indicated below:

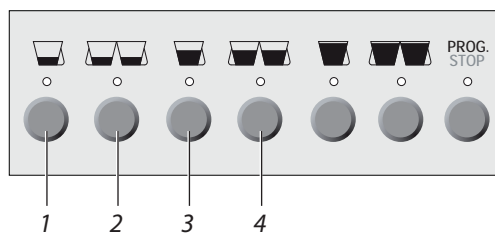
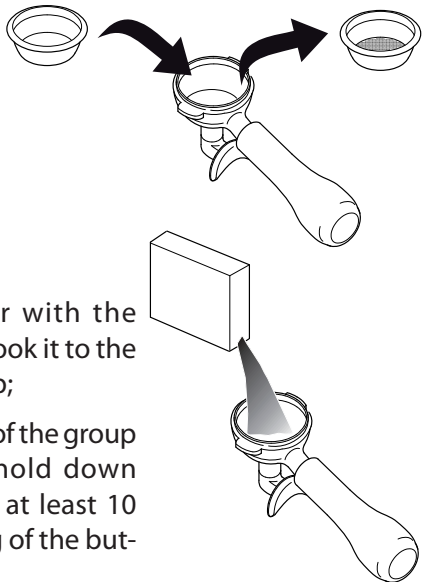
- Remove the filter from the filter holder and fit a blind filter (see spare parts);
- pour the special detergent (see spare parts) into the filter holder with the blind filter and hook it to the dispensing group;
- dispense until the water comes out clean;
- remove the filter holder from the group and dispense at least once, so as to eliminate detergent residues.
- remove the blind filter from the filter holder and replace it with the original one.



8.7.5 SAE-DISPLAY version dispensing group wash

Wash the dispensing groups daily as indicated below:

- Remove the filter from the filter holder and fit a blind filter (see spare parts);
- pour the special detergent (see spare parts) into the filter holder with the blind filter and hook it to the dispensing group;
- on the keyboard of the group to be washed, hold down the button 2 for at least 10 seconds (flashing of the button 2 led);



- to activate the wash press the button 2 again (flashing of buttons 1 and 2 - in versions with display, the following message appears:

GROUP WASHING
IN PROGRESS

- wait for the complete execution of the 5 automatic washing cycles (this takes roughly 1 minute);
- after the first wash cycle indicated by the flashing of the button 2 LED, remove the blind filter holder from the group;
- activate the rinse cycle by pressing the button 2 again (flashing of buttons 3 and 4 - in versions with display, the following message appears:

GROUP WASHING
IN PROGRESS

- wait for the complete execution of the automatic rinse cycle (this takes roughly 1 minute);
- at the end of the rinse cycle, the machine is ready for normal use.



It is possible to wash more groups simultaneously, each keyboard controls the reference group.

In case of power failure during the washing or rinsing, the machine will prompt to perform the washing of the group again at the next start up. You will need to perform the operation again to eliminate the possible presence of detergent in the group.

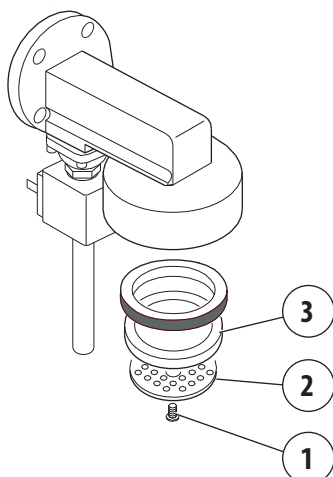


Do not carry out the washing of the group in the case of AL version.

8.7.6 Perforated disk and containment ring cleaning

Weekly perform the cleaning of the perforated disk and containment ring in the following way:

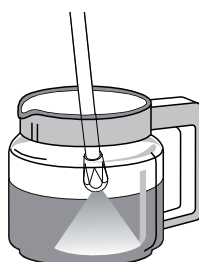
- Loosen the screw (1);
- remove the perforated disk (2) and the containment ring (3);
- carefully wash the two components with hot water;
- replace perforated disk and containment ring to its original position by locking everything with the screw.



8.7.7 Steam nozzle/autosteamer cleaning

Daily perform the cleaning of the steam nozzle in the following way:

- Immerse the spout in a jug with water and a specific detergent according to manufacturer's instructions;
- heat the solution with the steam of the spout;
- let the spout cool off keeping it immersed in the solution for at least 5 minutes to allow the detergent to rise inside the spout by cooling effect;
- repeat the operation 2 or 3 times until milk is delivered.



9. SPARE PARTS

For the replacement of components and/or parts of the machine, refer to the official documentation provided by the Manufacturer.



On the internet site of the Manufacturer all original spare parts are available. The Manufacturer may provide the list of spare parts recommended for the maintenance of the various versions of the machine.



In case of use of parts that are not original, the safety of the machine cannot be guaranteed. The Manufacturer reserves the right to void the machine warranty.

10. DISPLAY INDICATION

<p>1.0 BAR 120°C FILLING BOILER</p>	<p>Cause Boiler filled with water when using the machine for the first time or when refilling to reach the water level.</p>
<p>1.0 BAR 120°C FILLING TIME LIMIT</p>	<p>Description/Alarm Wait for the boiler to be completely filled.</p>
<p>DOSER ALARM</p>	<p>Cause Time for filling the boiler with water longer then expected.</p> <p>Description/Alarm Make sure the water mains tap is opened. Switch the machine off and back on again. If the warning stays on after a few attempts, turn the machine off and contact the Manufacturer.</p>
<p>REG. SOFTENER</p>	<p>Cause Fault of the volumetric electronic control .</p> <p>Description/Alarm Stop the dispensing by pressing the dose button. Turn the machine off and contact the Manufacturer.</p> <p>Cause Request regeneration of the water softener.</p> <p>Description/Alarm Carry out the water softener regeneration. To delete the message, press the 4 display keys for 5 seconds: ENTER, MODE, (+), (-) .</p>



If the problem cannot be solved, turn the machine off and contact the Manufacturer.

11. DECOMMISSIONING

In this case, it is necessary to disconnect the machine by unplugging it from the power, hydraulic and gas supply if required, and drain the internal circuits of all the water.

To connect the machine after this period, follow the procedures for the commissioning of the machine.

12. DISMANTLING

To dismantle the machine, follow the machine installation procedure in reverse; refer to chap."5. INSTALLATION" on page 19 .

All the disassembled components must be sorted out by material so as to facilitate the later disposal at authorized collection centers, as indicated in chap."13. DISPOSAL".

13. DISPOSAL

13.1 Information for disposal

Only for the European Union and the European Economic Area.



This symbol indicates that the product cannot be disposed of with household waste, according to the WEEE Directive (2012/19/EC), the Battery Directive (2006/66/EC) and/or the national laws implementing those Directives.

The product should be handed over to a designated collection point, for example the dealer when purchasing a new similar product, or an authorized collection site for recycling waste electrical and electronic equipment (WEEE), as well as batteries and accumulators. Improper handling of this type of waste can have negative consequences on the environment and human health, due to potentially hazardous substances that are generally associated with this kind of waste.

Your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources and avoid incurring the administrative sanctions provided by law. For more information about recycling this product, contact your local authorities, the body responsible for waste collection, an authorized dealer, or your household waste disposal service.

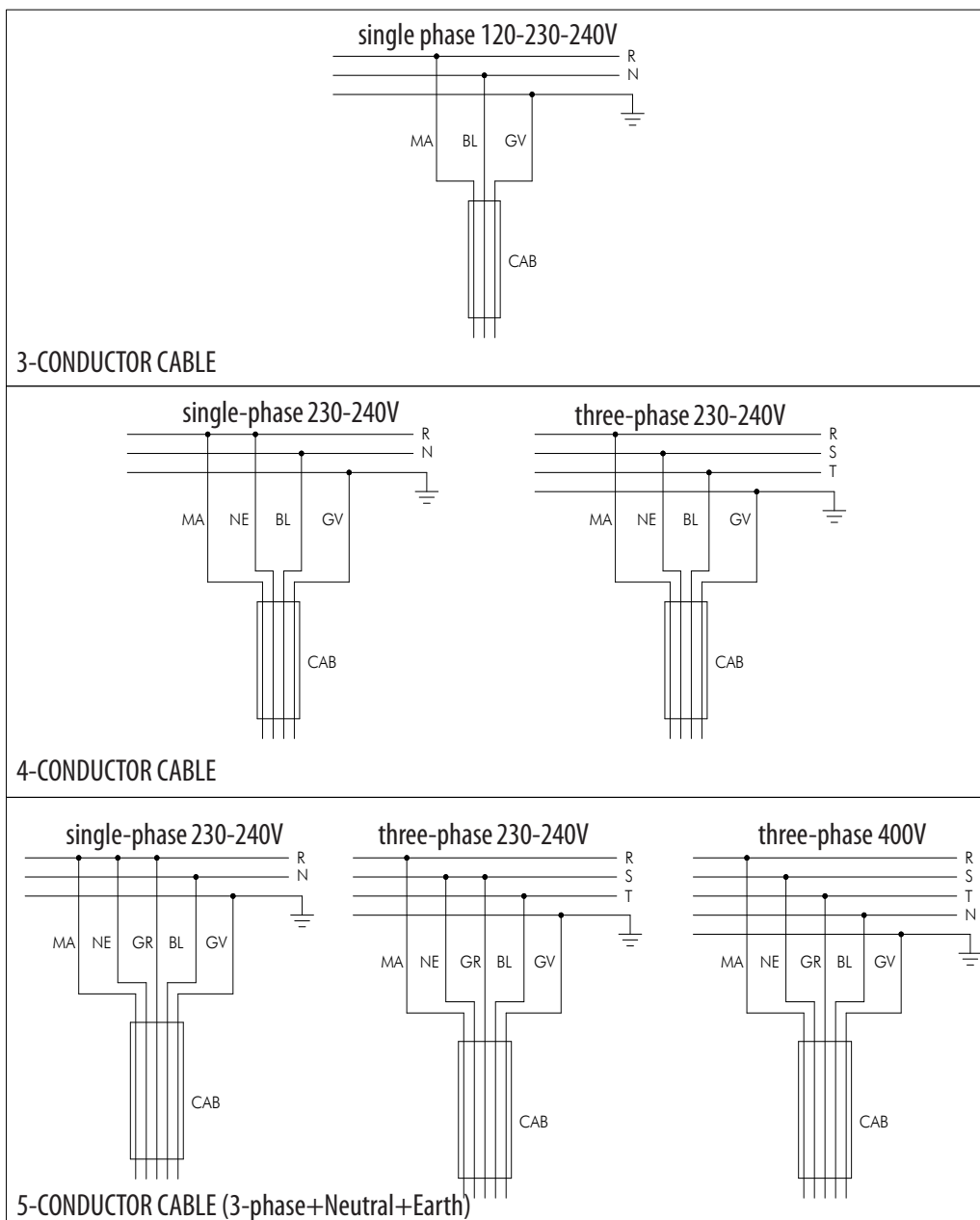
13.2 Environmental information

Inside the machine there is a button lithium battery required for the storage of the data that is placed in the electronic card.

Dispose of the battery in accordance with current local regulations.

14. WIRING DIAGRAMS

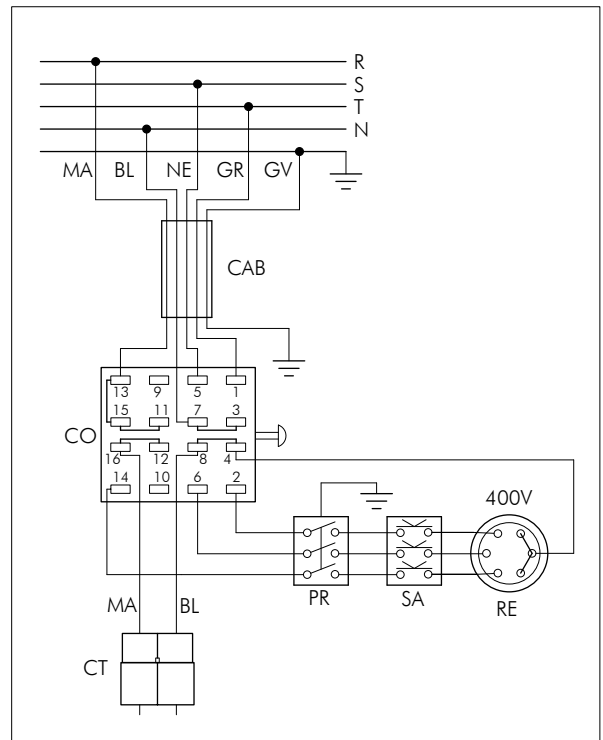
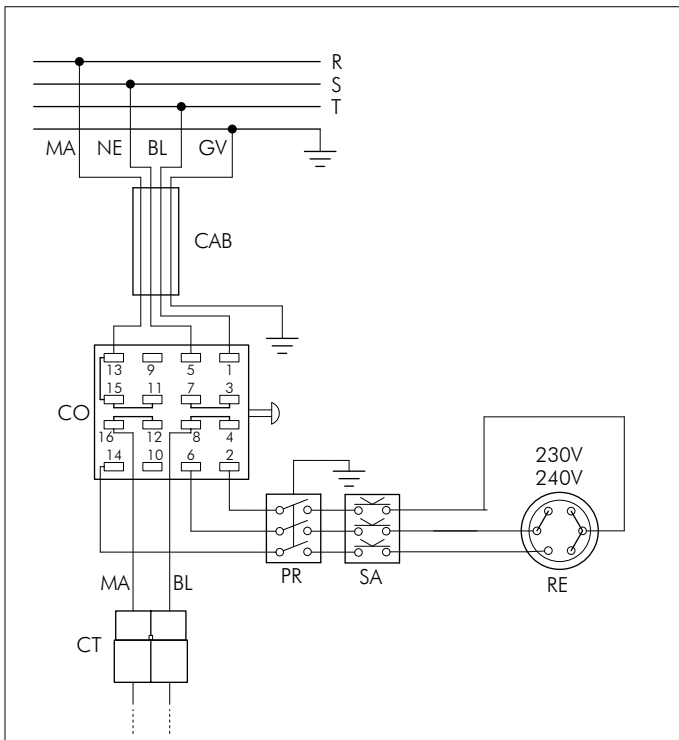
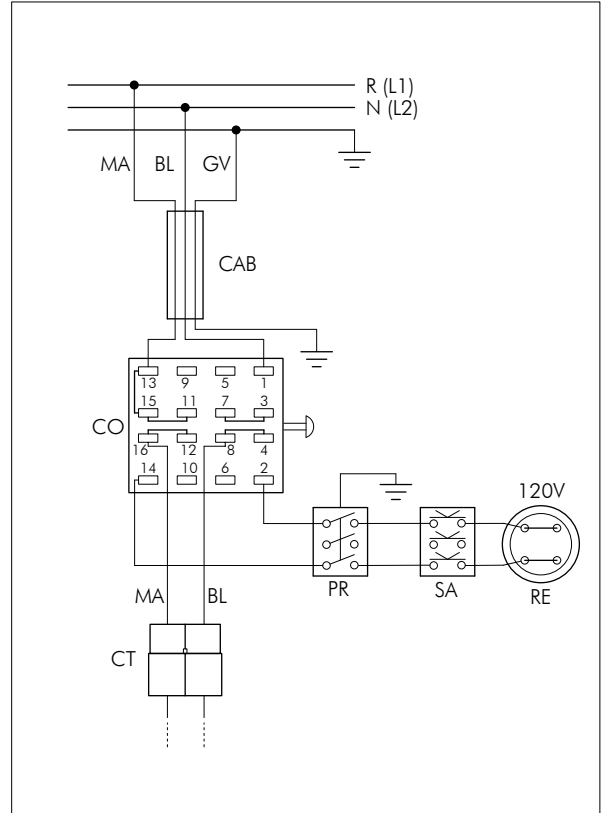
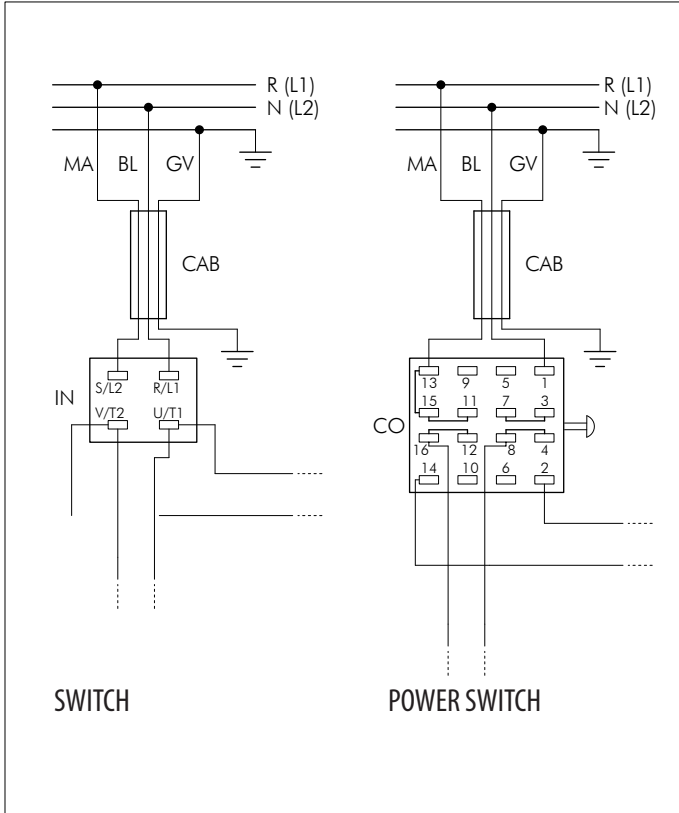
14.1 Connection to the POWER SUPPLY



R	Phase
S	Phase
T	Phase
N	Neutral
⊥	Earth

BL	Blue
CAB	Power cable
GR	Grey
GV	Yellow-green
MA	Brown
NE	Black

14.2 MACHINE Power Supply

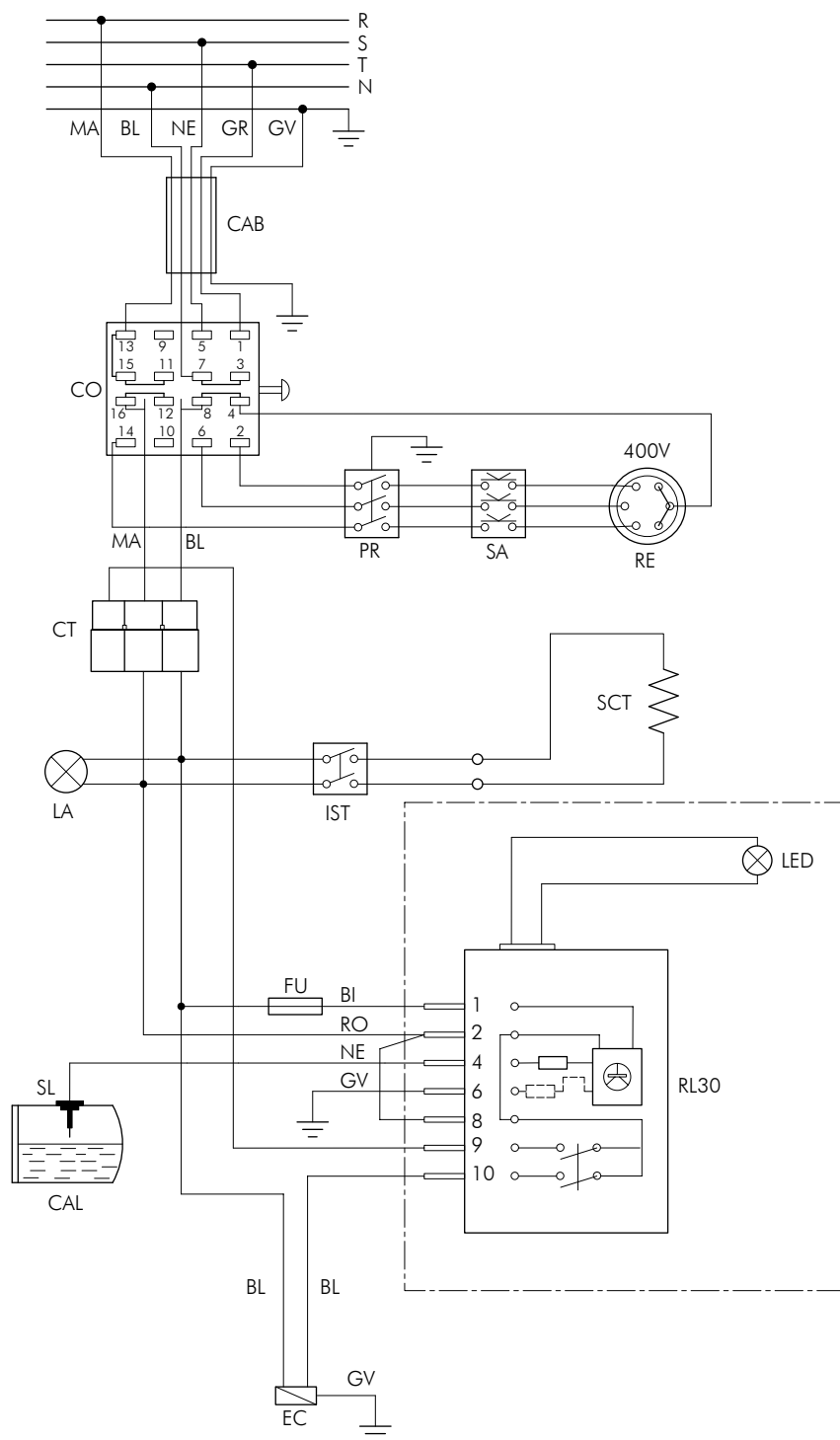


R	Phase
S	Phase
T	Phase
N	Neutral
	Earth
BL	Blue

CAB	Power cable
CO	Power switch
CT	Connector
GR	Grey
GV	Yellow-green
IN	Switch

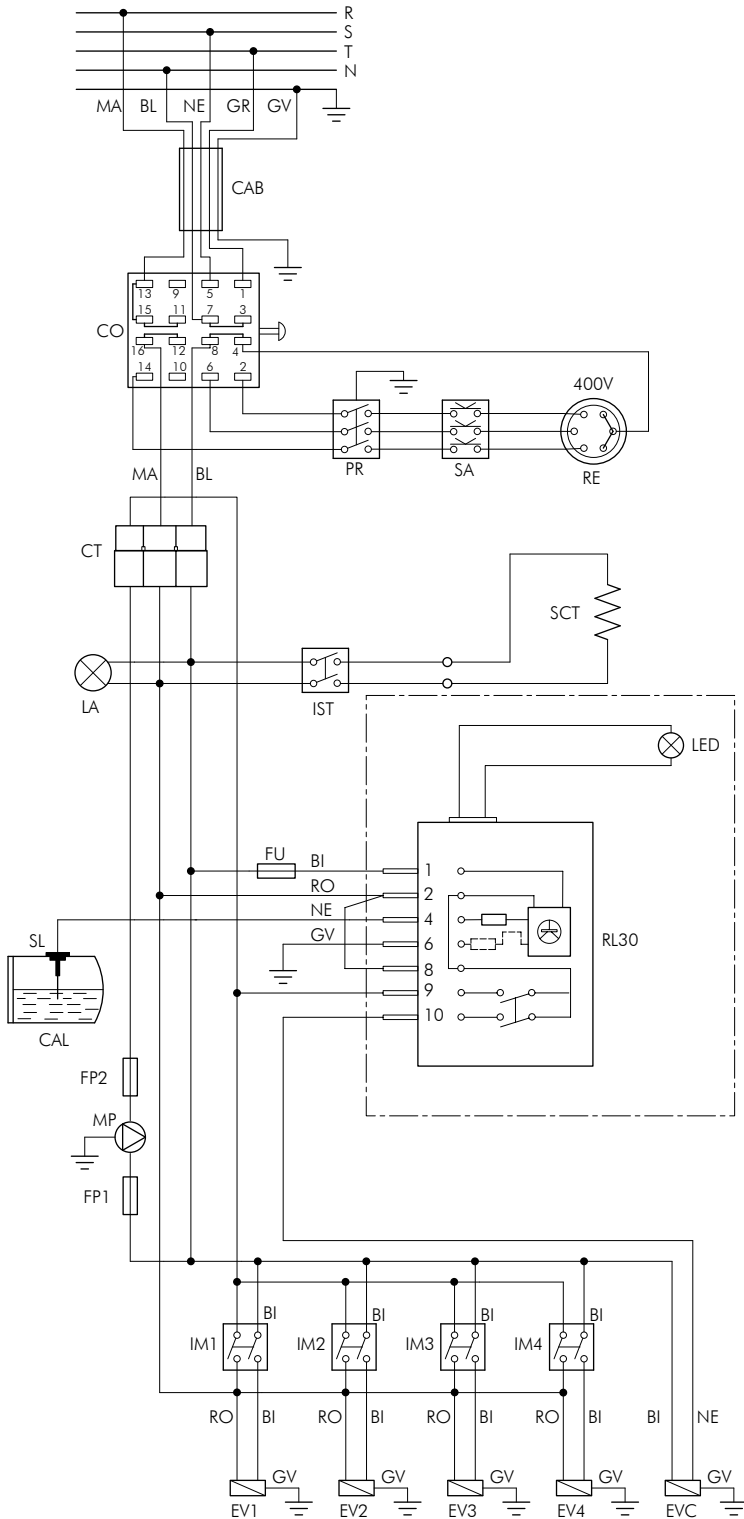
MA	Brown
NE	Black
PR	Pressure switch
RE	Resistance
SA	Resistance safety device

14.3 AL Version



BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CO	Power switch
CT	Supply connection
EC	Boiler filling solenoid valve
FU	Fuse
GR	Grey
GV	Yellow-green
LED	LED Timeout
IST	Cup heater switch
LA	Indicator light
MA	Brown
NE	Black
RO	Red
PR	Pressure switch
RE	Resistance
RL30	AEA control unit (optional)
SA	Resistance safety device
SL	Boiler level probe
VE	Green

14.4 AEP version



BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CO	Power switch
CT	Supply connection
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
FU	Fuse
GR	Grey
GV	Yellow-green
IM1	GR1 switch
IM2	GR2 switch
IM3	GR3 switch
IM4	GR4 switch
IST	Cup heater switch
LA	Indicator light
LED	LED Timeout
MA	Brown
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RO	Red
RL30	AEA control unit (optional)
SA	Resistance safety device
SL	Boiler level probe
VE	Green

(*) Fuses for UL versions with plug with a greater capacity than 30A

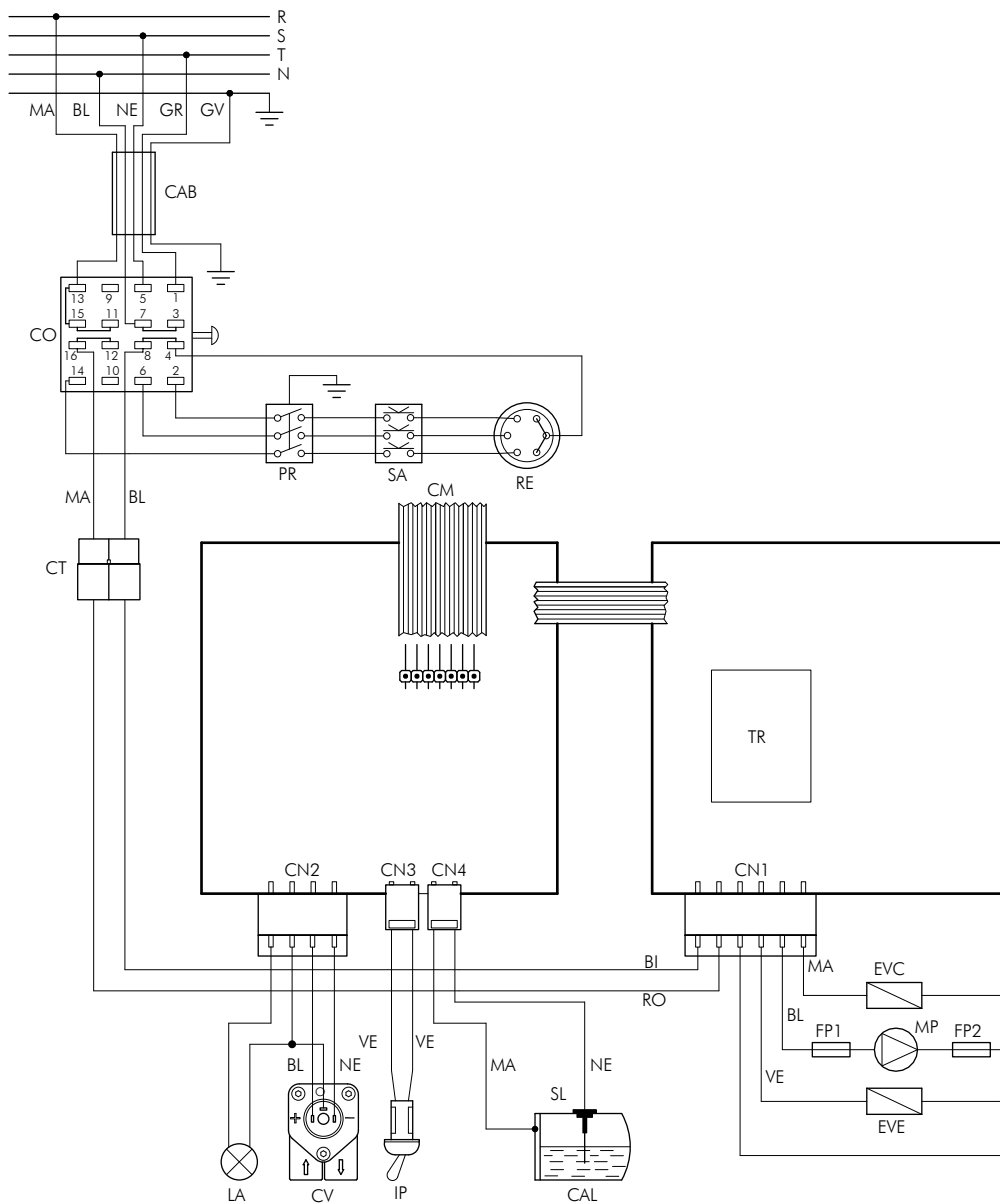
14.5 SAE-DISPLAY version

The table below shows, for each model of machine, the code for the control unit and the reference to the page with the wiring diagram.

Description			Control unit code	Giemme	Gicar
ARGENTA	JUN	120V	18366	par. 14.5.1	
		230V	18365	par. 14.5.1	
	1-2-3GR	120V	18078	par. 14.5.4	
		230V	18079	par. 14.5.4	
	4GR	230V	18077	par. 14.5.4	
BRAVA	1-2-3GR	120V	18090017	par. 14.5.5	par. 14.5.6
		230V	18090016	par. 14.5.5	par. 14.5.6
	4GR	230V	18090028	par. 14.5.5	par. 14.5.6
CALYPSO	1-2-3GR	120V	18090030	par. 14.5.7	par. 14.5.8
		230-240V	18090030	par. 14.5.7	par. 14.5.8
CALYPSO DISPLAY	1-2-3-4GR	120V	18090079	par. 14.5.11	
		230V	18090080	par. 14.5.11	
CKXE	CKX	120-230V	18090067	par. 14.5.13	
	CKXE		18090068	par. 14.5.14	
DENISE	1-2-3GR	120V	18078	par. 14.5.4	
		230V	18079	par. 14.5.4	
	4GR	230V	18077	par. 14.5.4	
DIVINA	JUN	120V	18371011	par. 14.5.2	
		230V	18371010	par. 14.5.2	
	1-2-3GR	120V	18090017	par. 14.5.5	par. 14.5.6
		230-240V	18090016	par. 14.5.5	par. 14.5.6
	4GR	120V	18090029	par. 14.5.5	par. 14.5.6
230-240V	18090028	par. 14.5.5	par. 14.5.6		
DORA	JUN	120V	18366	par. 14.5.1	
		230V	18365	par. 14.5.1	
	1-2-3GR	120V	18090030	par. 14.5.7	par. 14.5.8
230-240V	18090031	par. 14.5.7	par. 14.5.8		
FORMA	1-2GR	230V	18088004	par. 14.5.16	
	3-4GR		18088005	par. 14.5.16	
GLORIA	1-2-3GR	120V	18090047	par. 14.5.9	par. 14.5.10
		230V	18090048	par. 14.5.9	par. 14.5.10
GLORIA DISPLAY	1-2-3-4GR	120V	18090079	par. 14.5.11	
		230V	18090080	par. 14.5.11	
GLORIA LCL	1-2-3GR	120V	18090051	par. 14.5.12	
		230V	18090052	par. 14.5.12	
GLORIA R12	1-2-3GR	120V	18090047	par. 14.5.9	par. 14.5.10
		230V	18090048	par. 14.5.9	par. 14.5.10
GLORIA R12 DISPLAY	1-2-3-4GR	120V	18090079	par. 14.5.11	
		230V	18090080	par. 14.5.11	
LISA	JUN	120V	18366	par. 14.5.1	
		230V	18365	par. 14.5.1	
	1-2-3GR	120V	18078	par. 14.5.4	
		230V	18079	par. 14.5.4	
	4GR	230V	18077	par. 14.5.4	

Description		Control unit code	Giemme	Gicar	
LISA R	1-2-3GR	120V	18090047	par. 14.5.9	par. 14.5.10
		230V	18090048	par. 14.5.9	par. 14.5.10
LISA R DISPLAY	1-2-3-4GR	120V	18090079	par. 14.5.11	
		230V	18090080	par. 14.5.11	
LISA LCL	1-2-3GR	120V	18090051	par. 14.5.12	
		230V	18090052	par. 14.5.12	
NEW START	1-2-3GR	120V	18090030	par. 14.5.7	par. 14.5.8
		230-240V	18090031	par. 14.5.7	par. 14.5.8
PERLA	JUN	120V	18090065	par. 14.5.3	
		230V	18090066	par. 14.5.3	
	1-2-3GR	120V	18090047	par. 14.5.9	par. 14.5.10
		230V	18090048	par. 14.5.9	par. 14.5.10
PERLA DISPLAY	1-2-3-4GR	120V	18090079	par. 14.5.11	
		230V	18090080	par. 14.5.11	
PERLA LCL	1-2-3GR	120V	18090051	par. 14.5.12	
		230V	18090052	par. 14.5.12	
PRATIC	1-2-3GR	120V	18090030	par. 14.5.7	par. 14.5.8
		230-240V	18090031	par. 14.5.7	par. 14.5.8
PRATIC AVANT	1-2-3GR	120V	18090030	par. 14.5.7	par. 14.5.8
		230-240V	18090031	par. 14.5.7	par. 14.5.8
PRATIC AVANT EXTRA	1-2-3GR	120V	18090030	par. 14.5.7	par. 14.5.8
		230-240V	18090031	par. 14.5.7	par. 14.5.8
SABRINA	1-2-3GR	120V	18090171	par. 14.5.18	
		230V	18090172	par. 14.5.18	
SABRINA DISPLAY	1-2-3GR	120V	18090161	par. 14.5.19	
		230V	18090162	par. 14.5.19	
SETTANTA	1-2-3GR	120V	18090047	par. 14.5.9	par. 14.5.10
		230V	18090048	par. 14.5.9	par. 14.5.10
SETTANTA DISPLAY	1-2-3-4GR	120V	18090079	par. 14.5.11	
		230V	18090080	par. 14.5.11	
SETTANTA LCL	1-2-3GR	120V	18090051	par. 14.5.12	
		230V	18090052	par. 14.5.12	
SIBILLA	1-2-3GR	120V	18090047	par. 14.5.9	par. 14.5.10
		230V	18090048	par. 14.5.9	par. 14.5.10
SIBILLA DISPLAY	1-2-3-4GR	120V	18090079	par. 14.5.11	
		230V	18090080	par. 14.5.11	
TANYA	1-2-3GR	120V	18090030	par. 14.5.7	par. 14.5.8
		230-240V	18090031	par. 14.5.7	par. 14.5.8
TANYA CAPS-PODS	2GR	120V	18090146	par. 14.5.17	
		230V	18090130	par. 14.5.17	
TOUCH	1-2GR	230V	18088000	par. 14.5.15	
	3-4GR		18088001	par. 14.5.15	
VANIA	JUN	120V	18371011	par. 14.5.2	
		230V	18371010	par. 14.5.2	
	1-2-3GR	120V	18090017	par. 14.5.5	par. 14.5.6
		230-240V	18090016	par. 14.5.5	par. 14.5.6

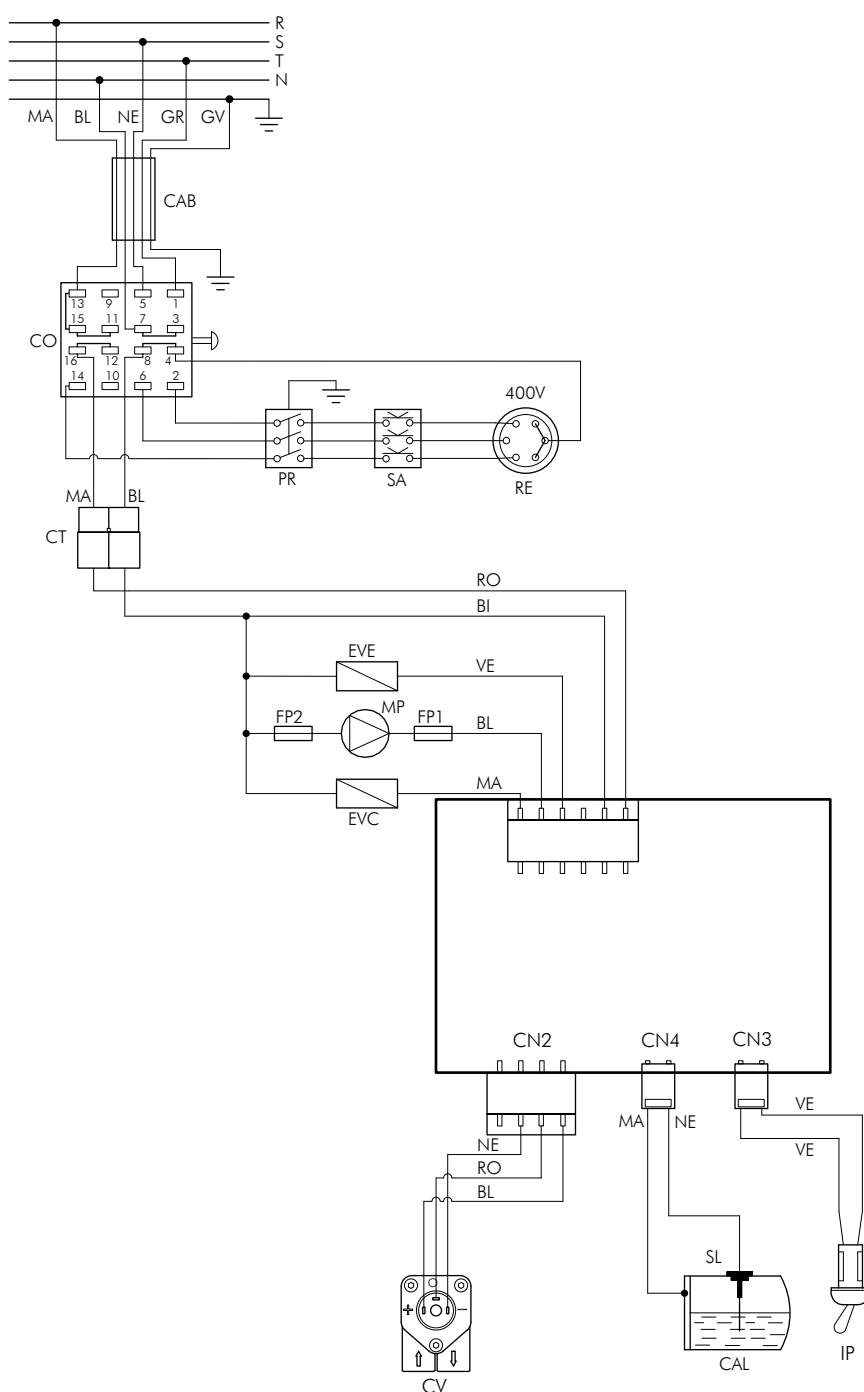
14.5.1 Wiring diagram cod.18365 - 18366 *JUNIOR*



BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CM	Membrane connection
CN1	Power supply and services outputs
CN2	Dosing device output
CN3	Programming switch
CN4	Boiler level
CO	Power switch
CT	Supply connection
CV	Volumetric counter
EVC	Boiler filling solenoid valve
EVE	Dispensing solenoid valve
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IP	Programming switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TR	Transformer
VE	Green

(*) Fuses for UL versions with plug with a greater capacity than 30A

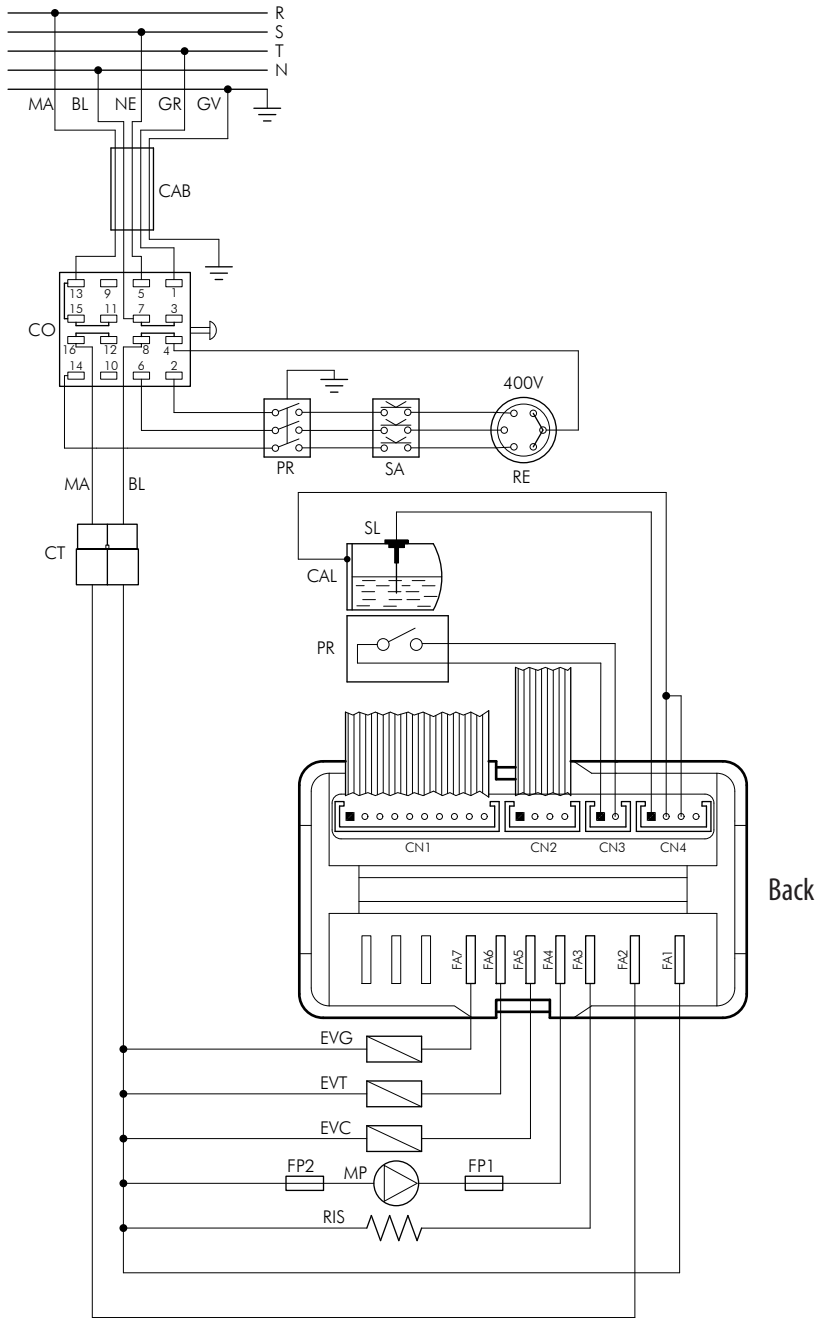
14.5.2 Wiring diagram cod.18371010 - 18371011 *JUNIOR*



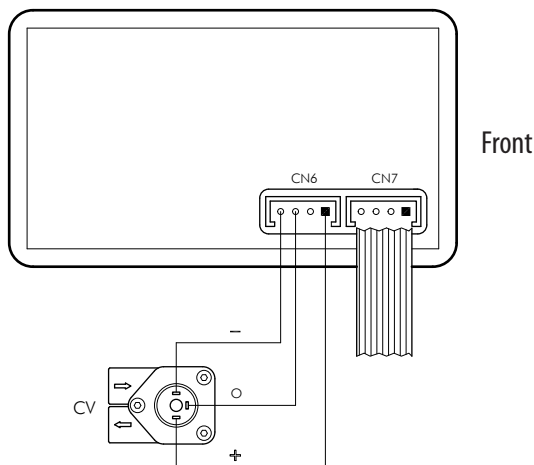
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Power supply and services outputs
CN2	Dosing device output
CN3	Programming switch
CN4	Boiler level
CO	Power switch
CT	Supply connection
CV	Volumetric counter
EVC	Boiler filling solenoid valve
EVE	Dispensing solenoid valve
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IP	Programming switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SL	Boiler level probe
VE	Green

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.3 Wiring diagram cod.18090065 - 18090066 *JUNIOR*



Back

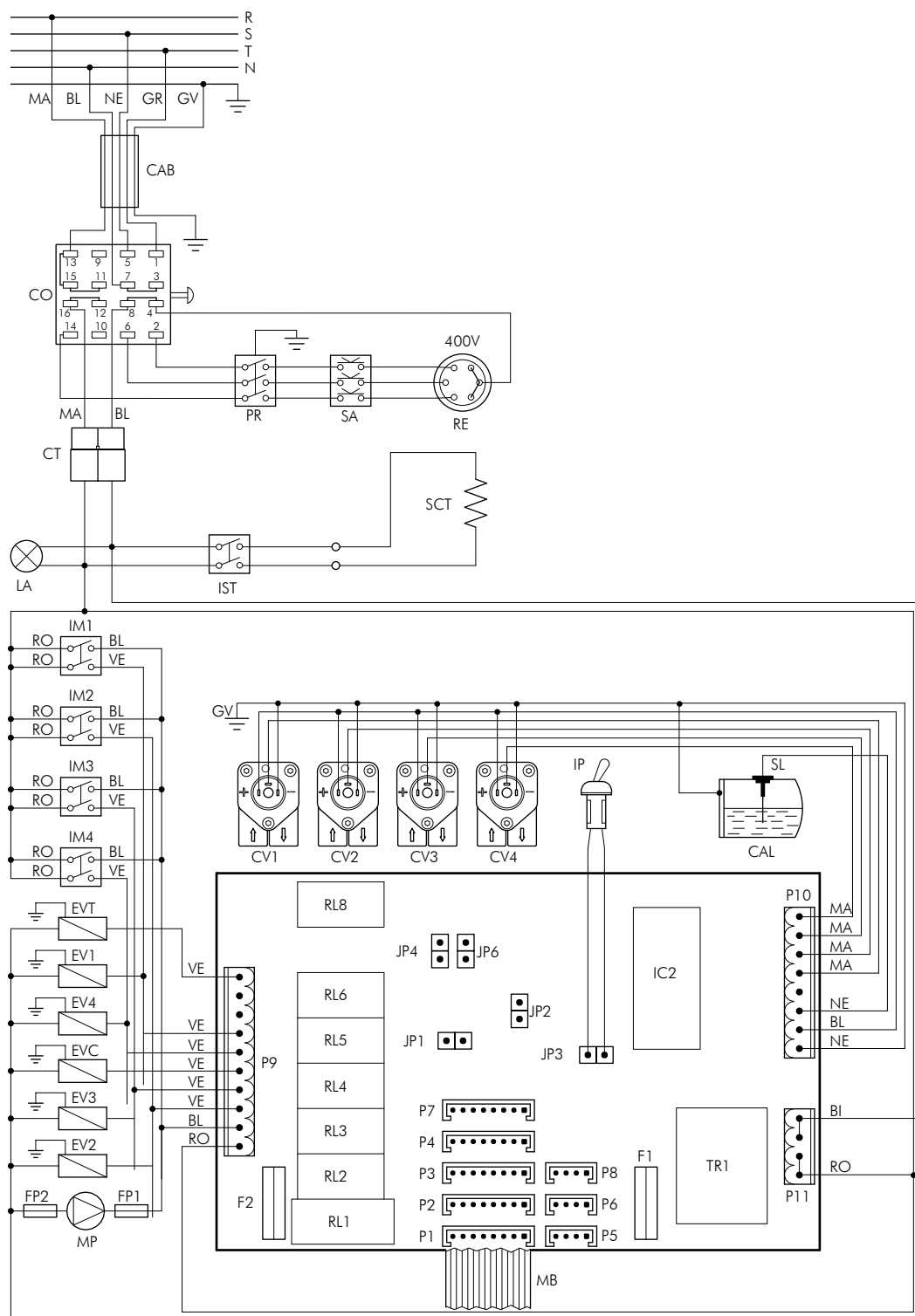


Front

BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Push button panel connection
CN2	Tea button connection
CN3	Pressure switch connection
CN4	Boiler level connection
CN6	Volumetric counter connection
CN7	RS232 serial network connection
CO	Power switch
CT	Supply connection
CV	Volumetric counter
EVC	Boiler filling solenoid valve
EVG	Group solenoid valve
EVT	Tea solenoid valve
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RIS	Heating
RO	Red
SA	Resistance safety device
SL	Boiler level probe
VE	Green

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.4 Wiring diagram cod.18077 - 18078 - 18079

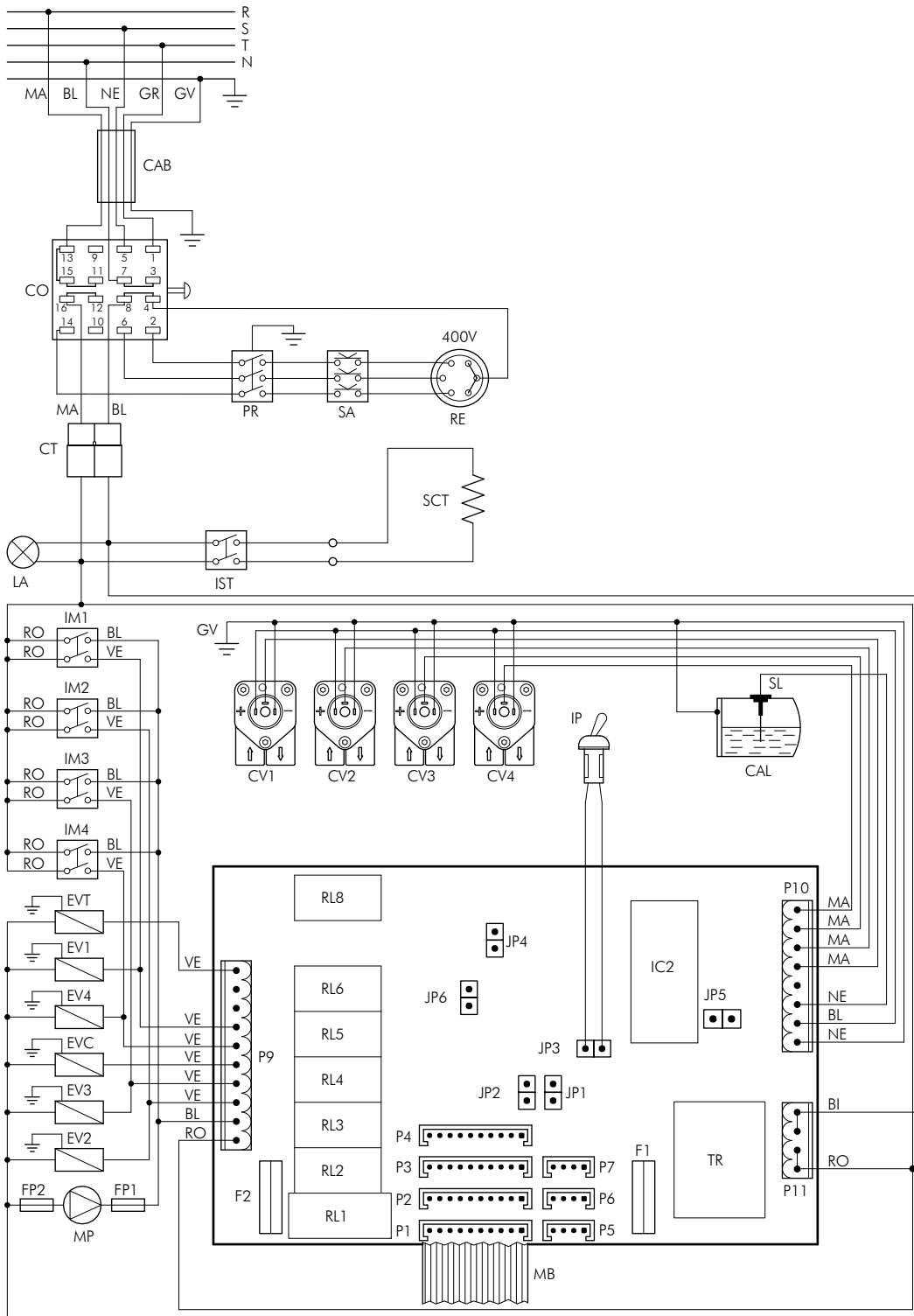


BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CO	Power switch
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Motor pump fuse (500mA)
F2	Inlet fuse (6.3A)
FP1(*)	Motor pump UL (OPD) fuse
FP1(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC2	Eprom
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IM4	GR4 manual switch
IP	Programming switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
P1	Push button panel connector GR1
P2	Push button panel connector GR2
P3	Push button panel connector GR3
P4	Push button panel connector GR4
P5	Tea connector key
P7	Serial connection
P9	Service outputs connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Resistance
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL8	Tea solenoid valve relay
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TR1	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Serial connection enabled	Serial connection disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming key	
JP4	Boiler filling with pump	Boiler filling without pump
JP6	Tea dispensing with pump	Tea dispensing without pump

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.5 Wiring diagram cod.18090016 - 18090017 - 18090028 - 18090029 *GIEMME*

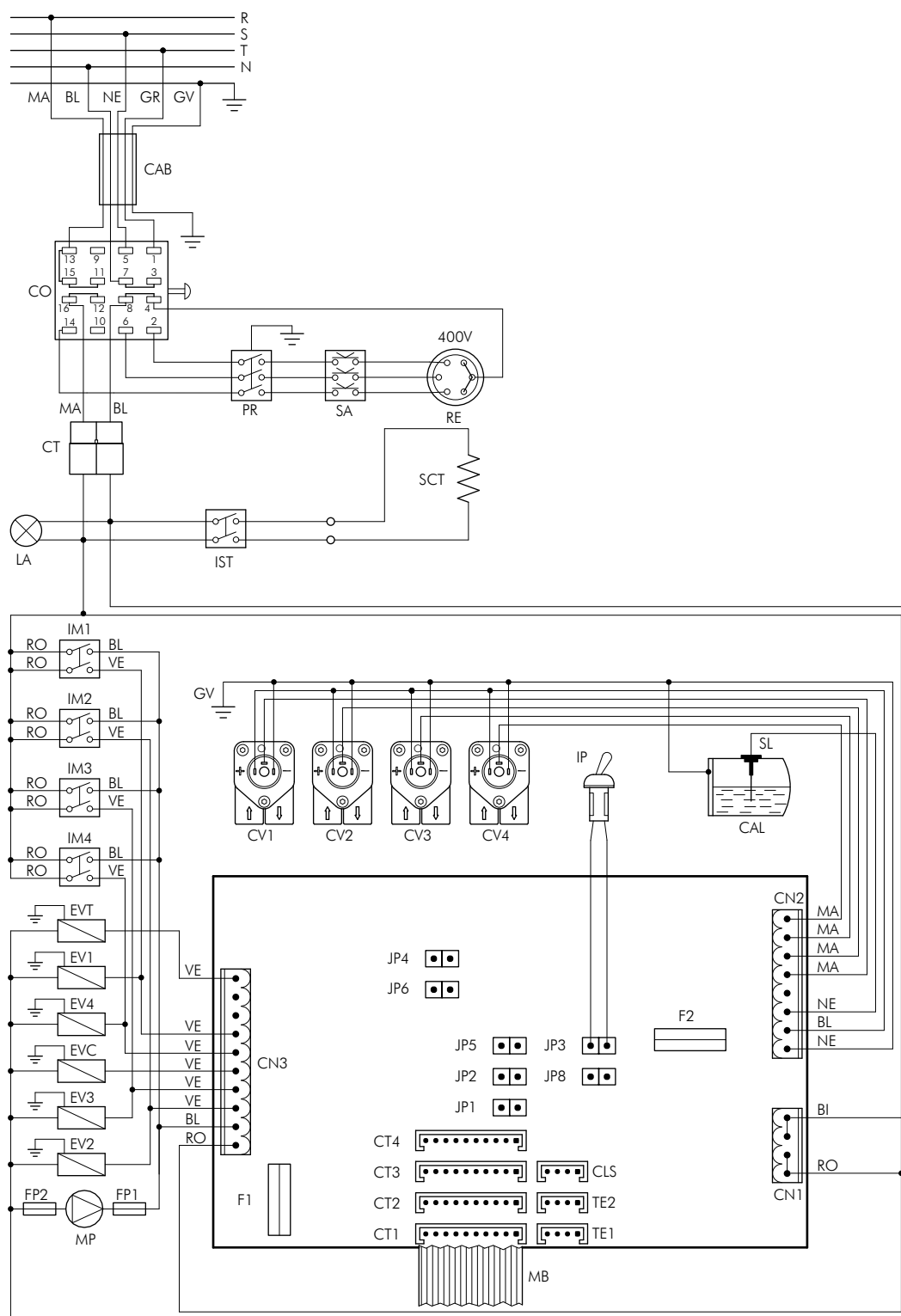


BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CO	Power switch
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Motor pump fuse (500mA)
F2	Inlet fuse (6.3A)
FP1(*)	Motor pump UL (OPD) fuse
FP1(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC2	Eprom
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IM4	GR4 manual switch
IP	Programming switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
P1	Push button panel connector GR1
P2	Push button panel connector GR2
P3	Push button panel connector GR3
P4	Push button panel connector GR4
P5	Tea connector key
P7	Serial connection
P9	Service outputs connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Resistance
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL8	Tea solenoid valve relay
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TR1	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Serial connection enabled	Serial connection disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming key	
JP4	Boiler filling with pump	Boiler filling without pump
JP6	Tea dispensing with pump	Tea dispensing without pump

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.6 Wiring diagram cod.18090016 - 18090017 - 18090028 - 18090029 *GICAR*

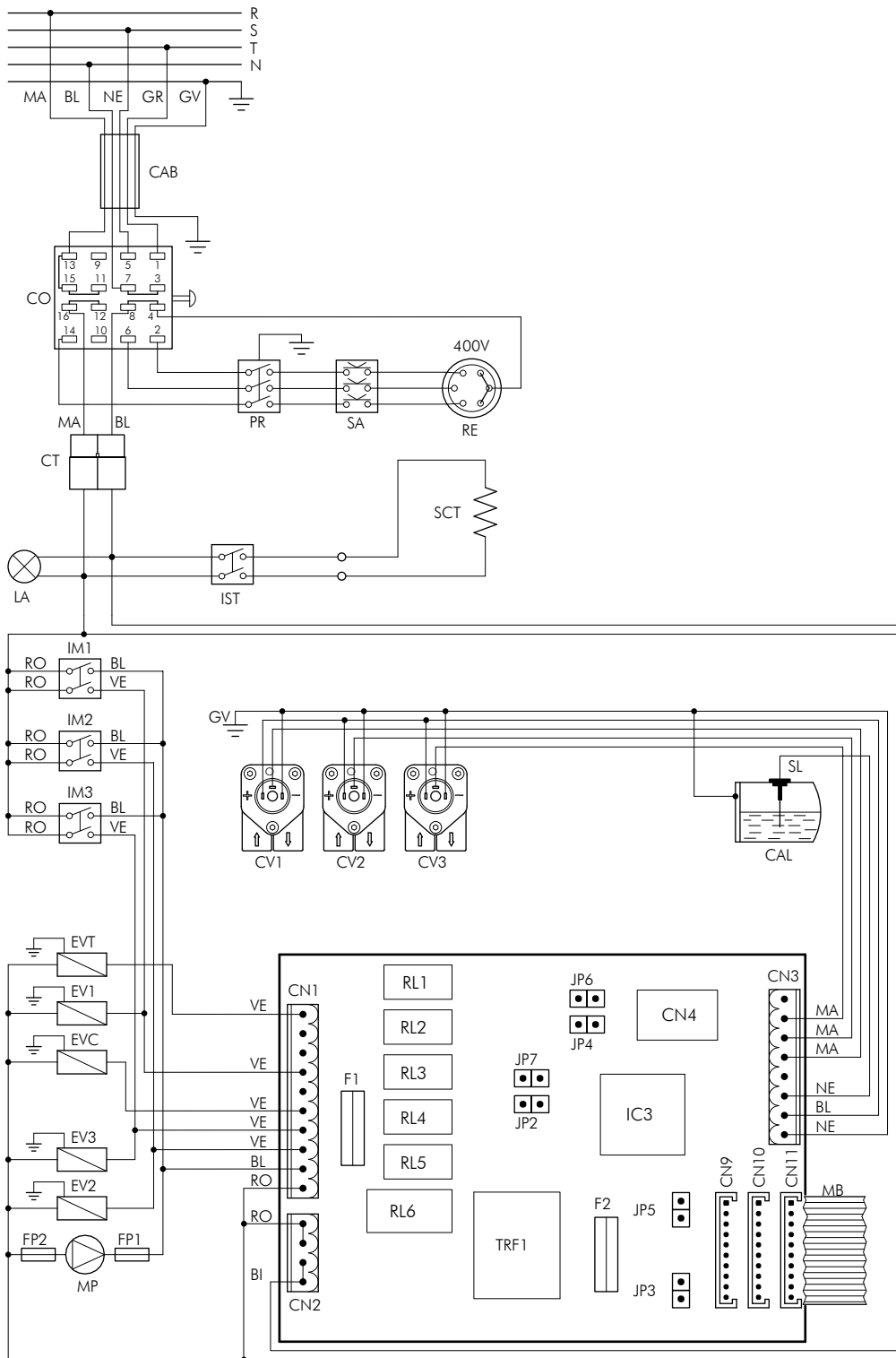


BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CLS	Serial connector
CN1	Power supply
CN2	Low voltage connector
CN3	Service outputs connector
CO	Power switch
CT	Supply connection
CT1	Push button panel connector GR1
CT2	Push button panel connector GR2
CT3	Push button panel connector GR3
CT4	Push button panel connector GR4
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Motor pump fuse (500mA)
F2	Inlet fuse (6.3A)
FP1(*)	Motor pump UL (OPD) fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC2	Eprom
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IM4	GR4 manual switch
IP	Programming switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TE 1	Tea dose
TE 2	Not managed
VE	Green

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

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.7 Wiring diagram cod. 18090030 - 18090031 *GIEMME*

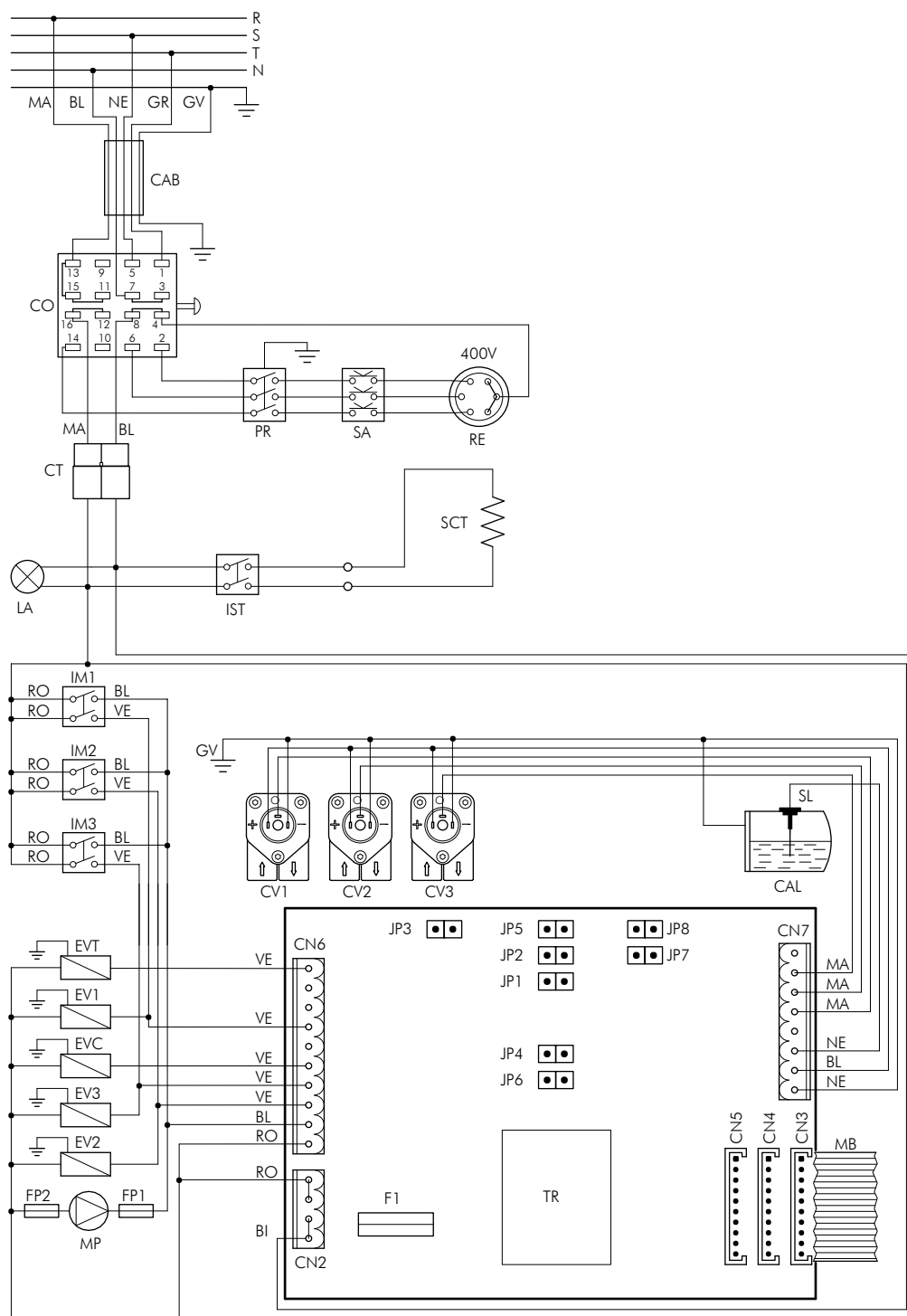


BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Service outputs connector
CN2	Supply connection
CN3	Low voltage connector
CN4	Programming connector
CN9	Push button panel connector GR3
CN10	Push button panel connector GR2
CN11	Push button panel connector GR1
CO	Power switch
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	Motor pump UL (OPD) fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC2	Eprom
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
PLT	Tea push button panel
PR	Pressure switch
RE	Resistance
RL1	Tea solenoid valve relay
RL2	Solenoid valve relay GR1
RL3	Boiler solenoid valve relay
RL4	Solenoid valve relay GR3
RL5	Solenoid valve relay GR2
RL6	Pump relay
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TRF1	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Dose programming enabled	Dose programming disabled
JP4	Boiler filling with pump	Programming disabled
JP5	Tea key enabled	Tea key disabled
JP6	Tea dispensing with pump	Tea dispensing without pump
JP7	STOP key continuation enabled	STOP key continuation enabled

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.8 Wiring diagram cod. 18090030 - 18090031 *GICAR*

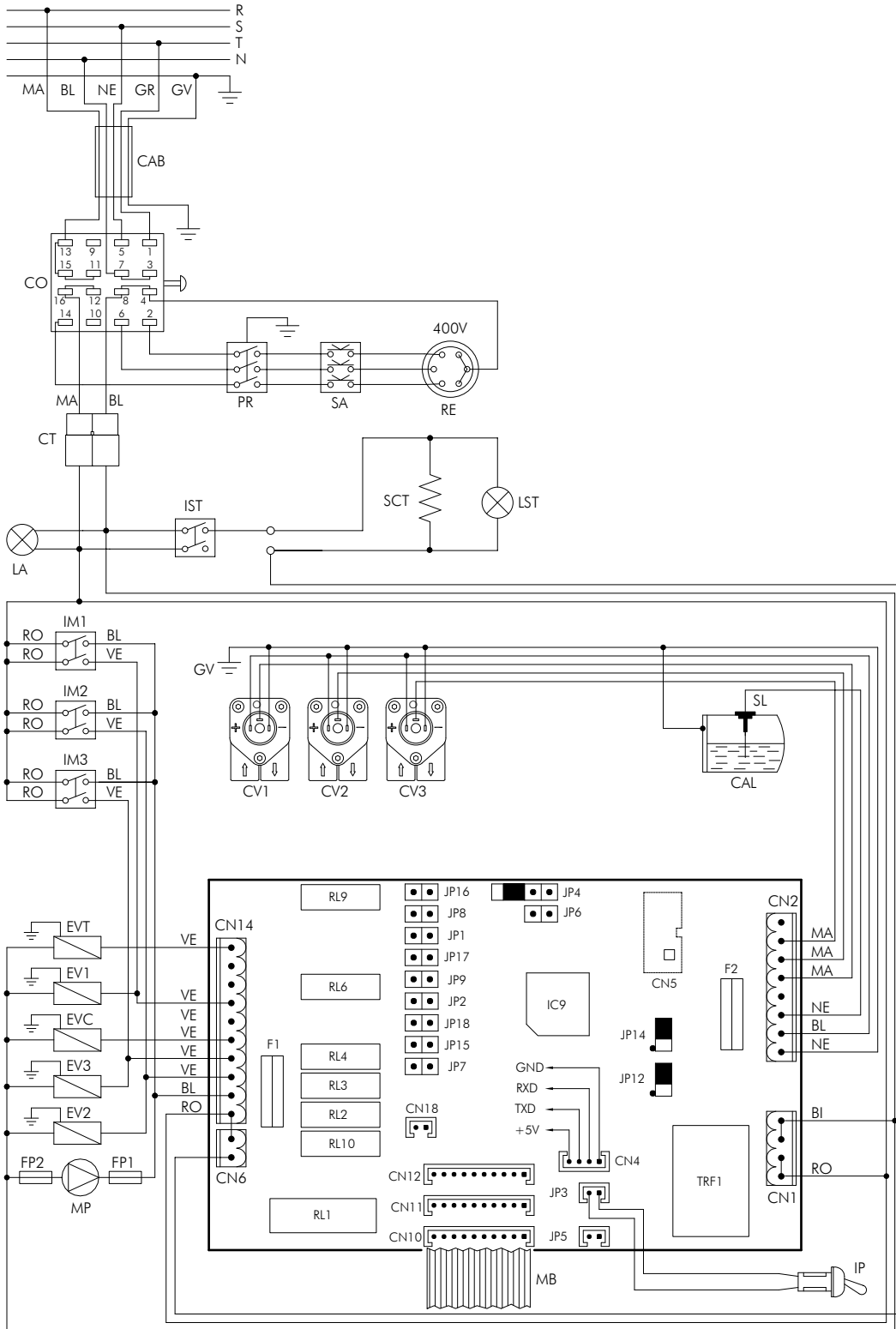


BI	White
BL	Blue
CAL	Boiler
CN2	Supply connection
CN3	Push button panel connector GR1
CN4	Push button panel connector GR2
CN5	Push button panel connector GR3
CN6	Service outputs connector
CN7	Low voltage connector
CO	Power switch
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	Motor pump UL (OPD) fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC2	Eprom
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RL1	Tea solenoid valve relay
RL2	Solenoid valve relay GR1
RL3	Boiler solenoid valve relay
RL4	Solenoid valve relay GR3
RL5	Solenoid valve relay GR2
RL6	Pump relay
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TR	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Not managed	Not managed
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming enabled	Programming disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Tea key enabled	Tea key disabled
JP6	Tea dispensing with pump	Tea dispensing without pump
JP7	STOP key continuation enabled	STOP key continuation enabled
JP8	Not managed	Not managed

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.9 Wiring diagram cod. 18090047 - 18090048 *GIEMME*



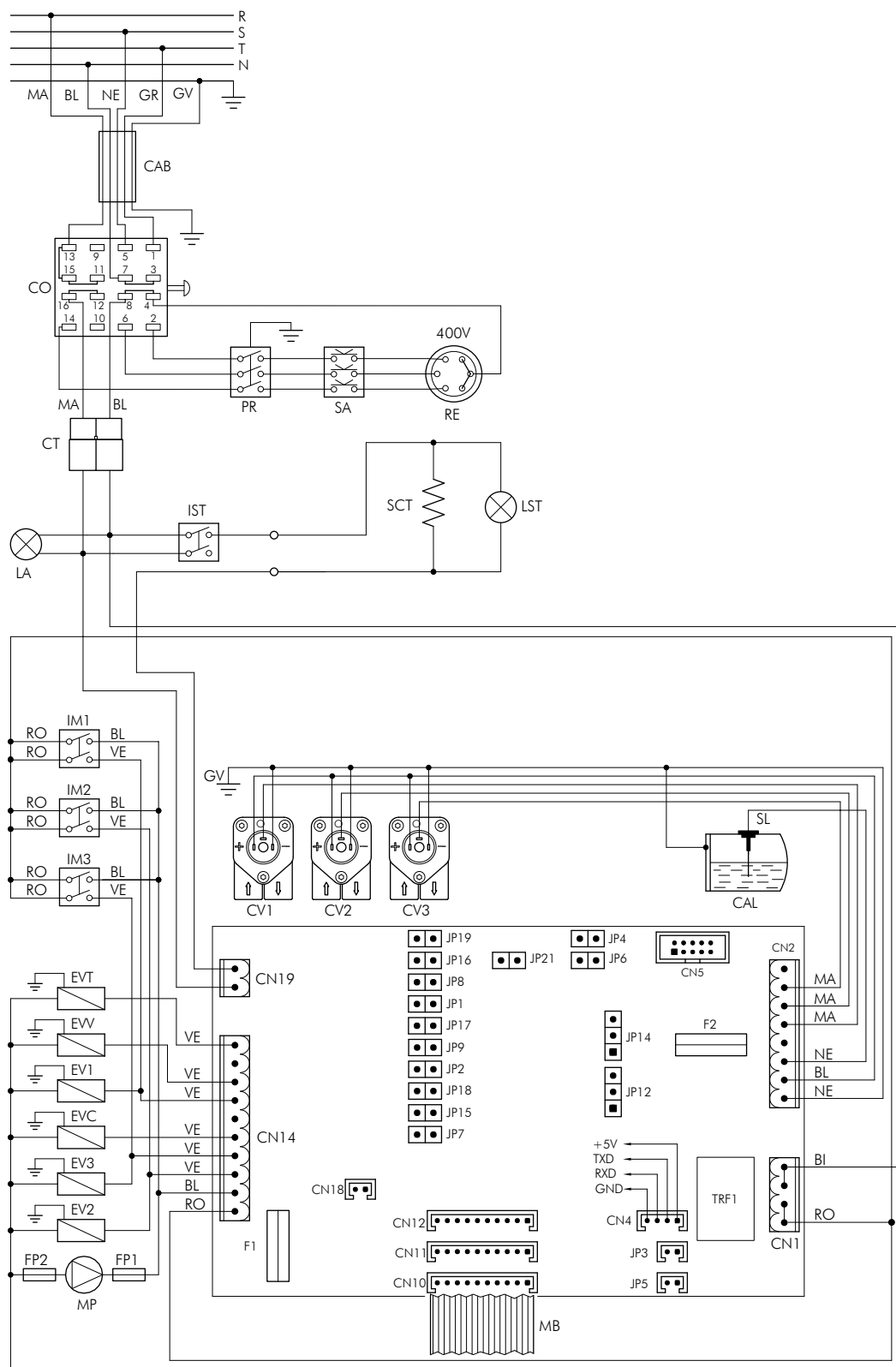
BI	White
BL	Blue
CAL	Boiler
CN1	Supply connection
CN2	Low voltage connector
CN4	Serial transmission connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CO	Power switch
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	Motor pump UL (OPD) fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC2	Microprocessor
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IP	Programming switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
P5	Tea dose
P6	Not managed
P7	Serial connection
P9	Service outputs connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TR	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming key connection	
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Tea key connection	
JP6	Tea dispensing with pump	Tea dispensing without pump
JP7	Continuous function disabled	Continuous function enabled
JP8	Dose count enabled	Dose count disabled

JUMPER	INSERTED	NOT INSERTED
JP9	Credit/Debit enabled	Credit/Debit disabled
JP15	Display function keys enabled	Display function keys disabled
JP16	6-key push button panel enabled	4-key push button panel enabled
JP17	Boiler t° check with external pressure switch (always on)	
JP18	Heat temp./press. management always ON	

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.10 Wiring diagram cod. 18090047 - 18090048 *GICAR*



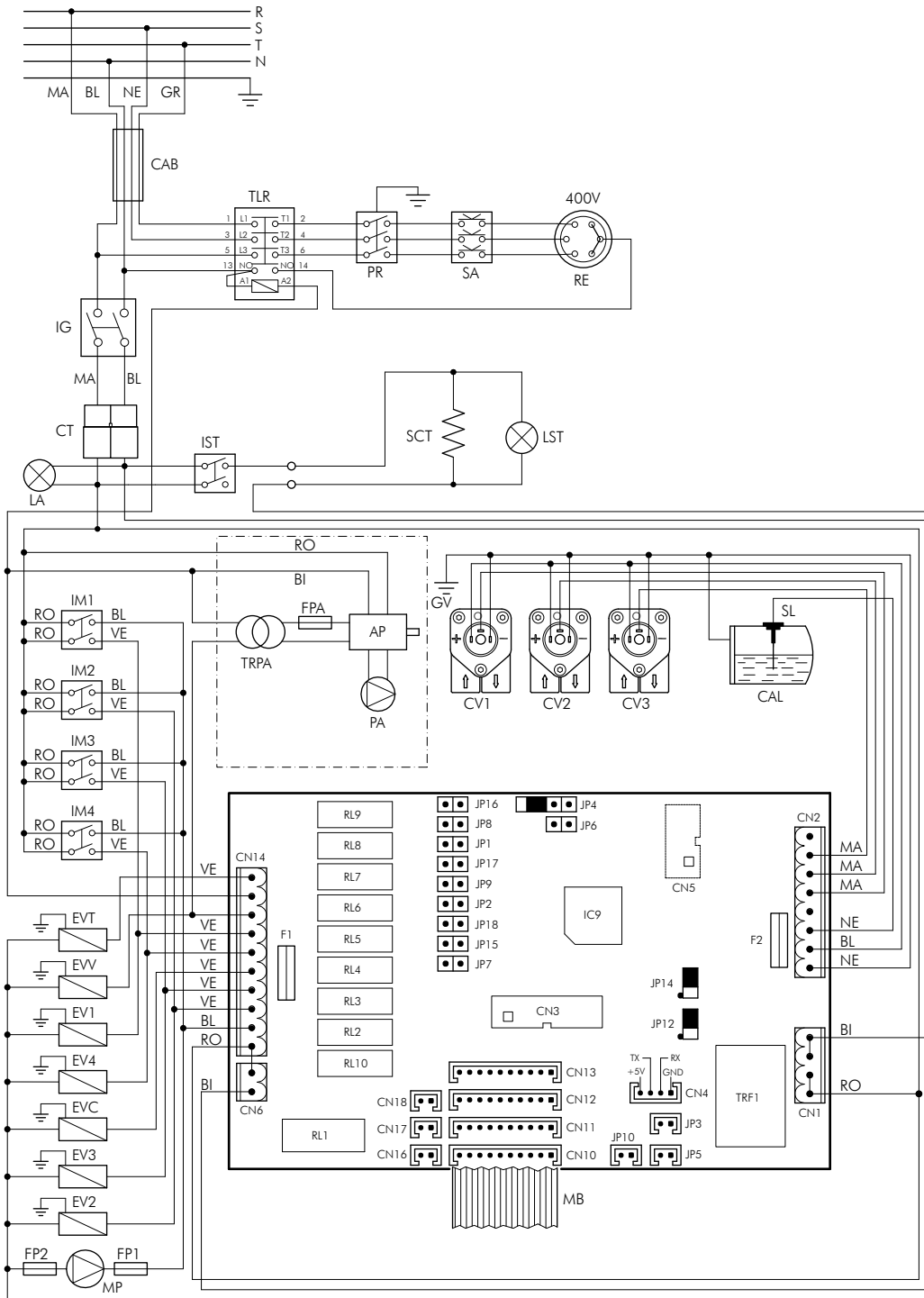
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Supply connection
CN2	Low voltage connector
CN4	Serial transmission connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN14	Service outputs connector
CN18	NTC cup heater connector
CN19	Cup-warmer heating el. connector
CO	Power switch
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	Motor pump UL (OPD) fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
P5	Tea dose
P6	Not managed
P7	Serial connection
P9	Service outputs connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SL	Boiler level probe
TRF1	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming key connection	
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Tea key connection	
JP6	Tea dispensing with pump	Tea dispensing without pump
JP7	Continuous function disabled	Continuous function enabled

JUMPER	INSERTED	NOT INSERTED
JP8	Dose count enabled	Dose count disabled
JP9	Credit/Debit enabled	Credit/Debit disabled
JP15	Display function keys enabled	Display function keys disabled
JP16	6-key push button panel enabled	4-key push button panel enabled
JP17	Boiler t° check with external pressure switch (always on)	
JP18	Heat temp./press. management always ON	

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.11 Wiring diagram cod. 18090079 - 18090080



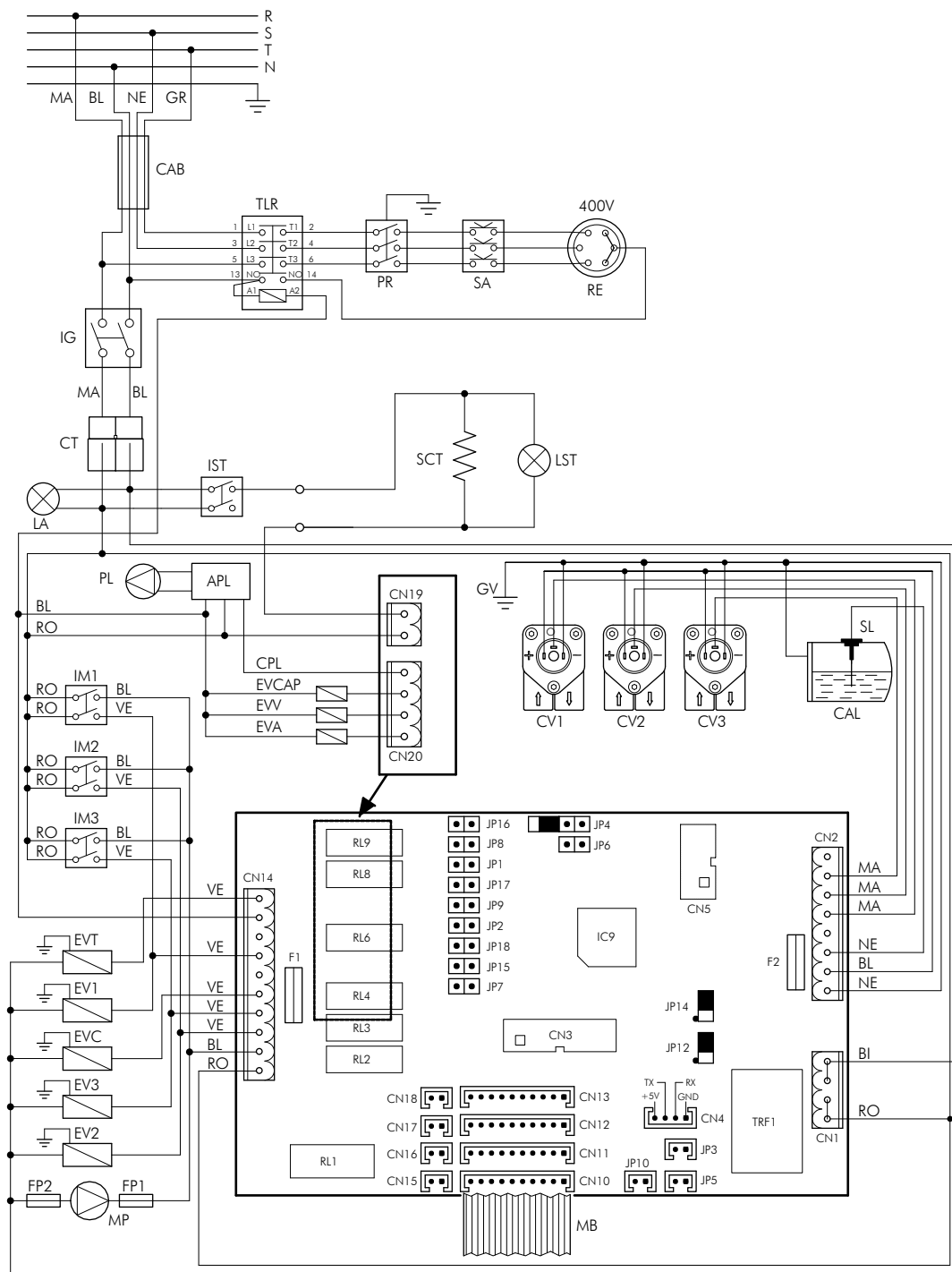
AP	Air pump supply
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Supply connection
CN2	Low voltage connector
CN3	Link connector display diag.
CN4	Serial transmission connector
CN5	Programm. connector ISP
CN6	Cup heater heating el. connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN13	Push button panel connector GR4
CN14	Service outputs connector
CN16	NTC autosteamer connector
CN17	NTC boiler connector
CN18	NTC cup heater connector
CPA	Air pump connector
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC9	Microprocessor
IG	Main switch
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IM4	GR4 manual switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
PA	Vcc air pump
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SCT	Cup heater heating element
TLR	Remote switch
TRF1	Transformer
TRPA	Air pump transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming key connection	
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Tea key connection	
JP6	Tea dispensing with pump	Tea dispensing without pump
JP7	Continuous function disabled	Continuous function enabled
JP8	Dose count enabled	Dose count disabled
JP9	Credit/Debit enabled	Credit/Debit disabled

JUMPER	INSERTED	NOT INSERTED
JP10	Autosteamer	
JP12	Not managed	Not managed
JP14	Not managed	Not managed
JP15	Display function keys enabled	Display function keys disabled
JP16	6-key push button panel enabled	4-key push button panel enabled
JP17	Boiler t°check with external pressure switch (always on)	
JP18	Heat.temp./press. management always ON	

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.12 Wiring diagram cod. 18090051 - 18090052



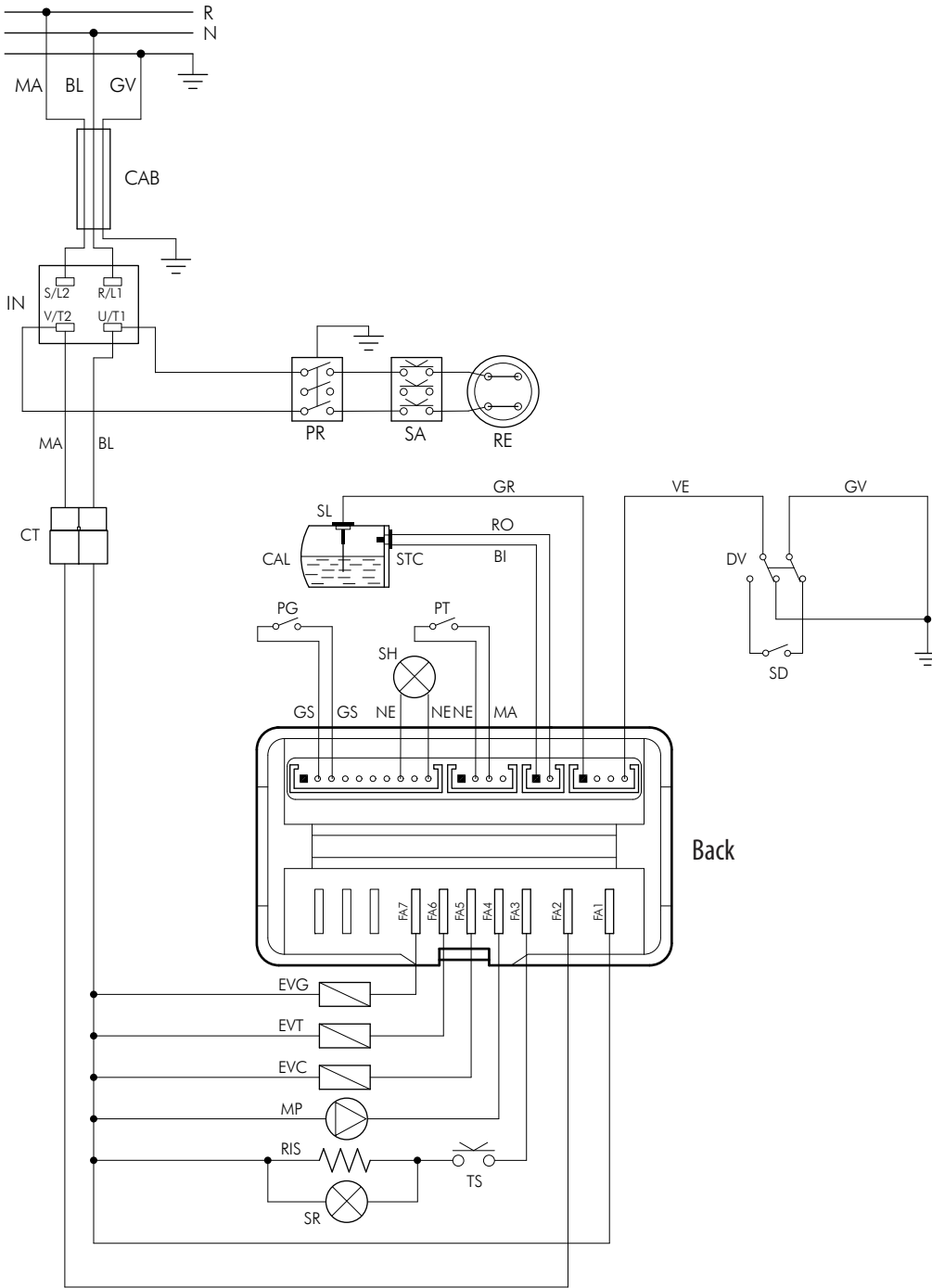
APL	Milk pump supply
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Supply connection
CN2	Low voltage connector
CN3	Link connector display diag.
CN4	Serial transmission connector
CN5	Programm. connector ISP
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN13	Autosteamer/capp. connector
CN14	Service outputs connector
CN16	NTC steam connector
CN17	NTC boiler connector
CN18	NTC cup heater connector
CPL	Milk pump control
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVA	Air solenoid valve
EVC	Boiler filling solenoid valve
EVCAP	Cappuc. mak. solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC9	Microprocessor
IG	Main switch
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PL	Milk pump
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SCT	Cup heater heating element
TLR	Remote switch
TRF1	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Not managed	Not managed
JP3	Programming key connection	
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Tea key connection	
JP6	Boiler filling with pump	Tea dispensing without pump
JP7	Continuous function disabled	Continuous function enabled
JP8	Dose count enabled	Dose count disabled
JP9	Credit/Debit enabled	Credit/Debit disabled

JUMPER	INSERTED	NOT INSERTED
JP10	Tea key 2 connection	
JP12	Not managed	Not managed
JP14	Not managed	Not managed
JP15	Display function keys enabled	Display function keys disabled
JP16	6-key push button panel enabled	4-key push button panel enabled
JP17	Boiler t° check with external pressure switch (always on)	
JP18	Heat.temp./press. management always ON	
JP22	Programming via Indar	

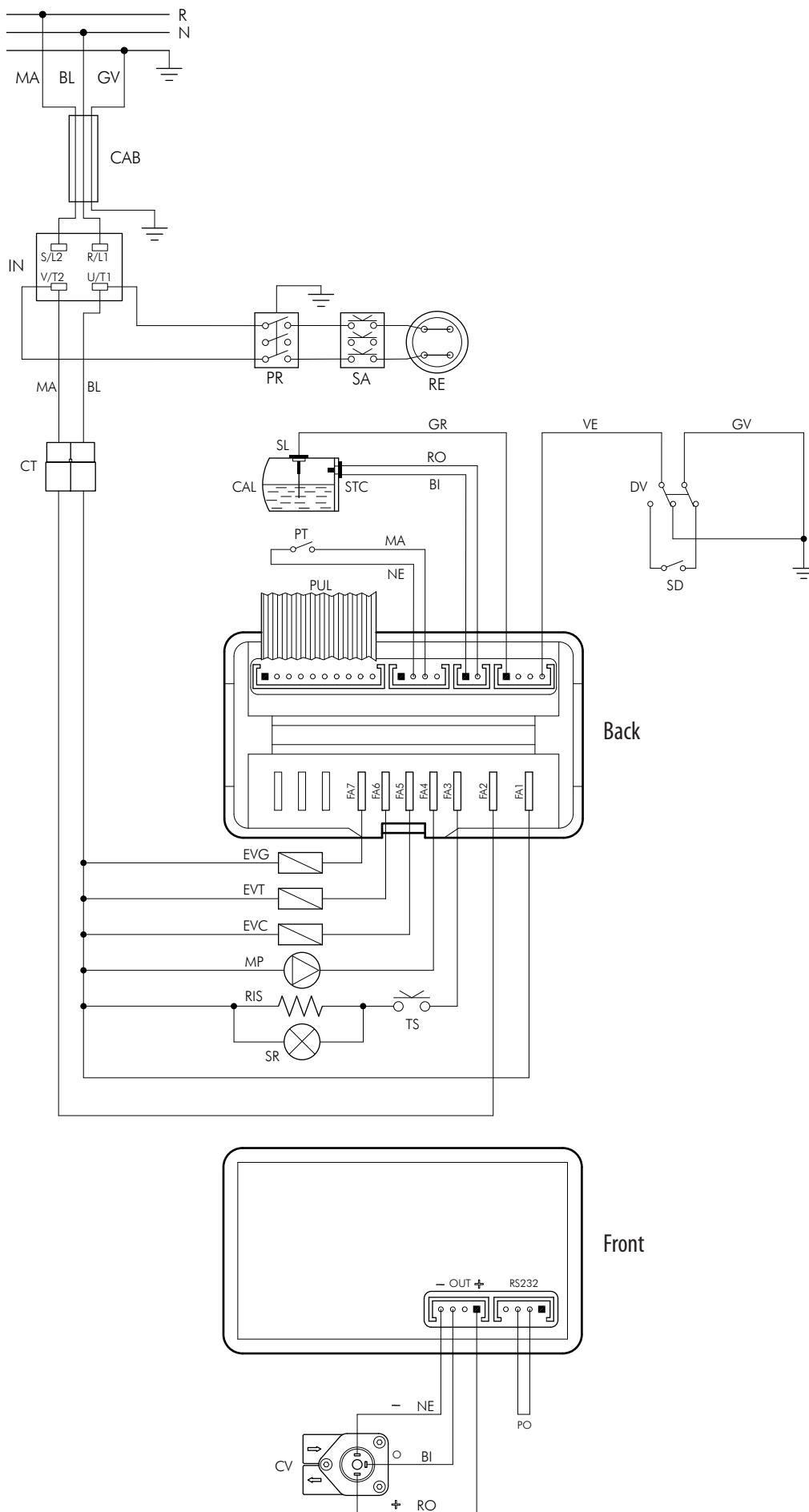
(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.13 Wiring diagram cod.18090067-18090068 *CKX* 120-230V*



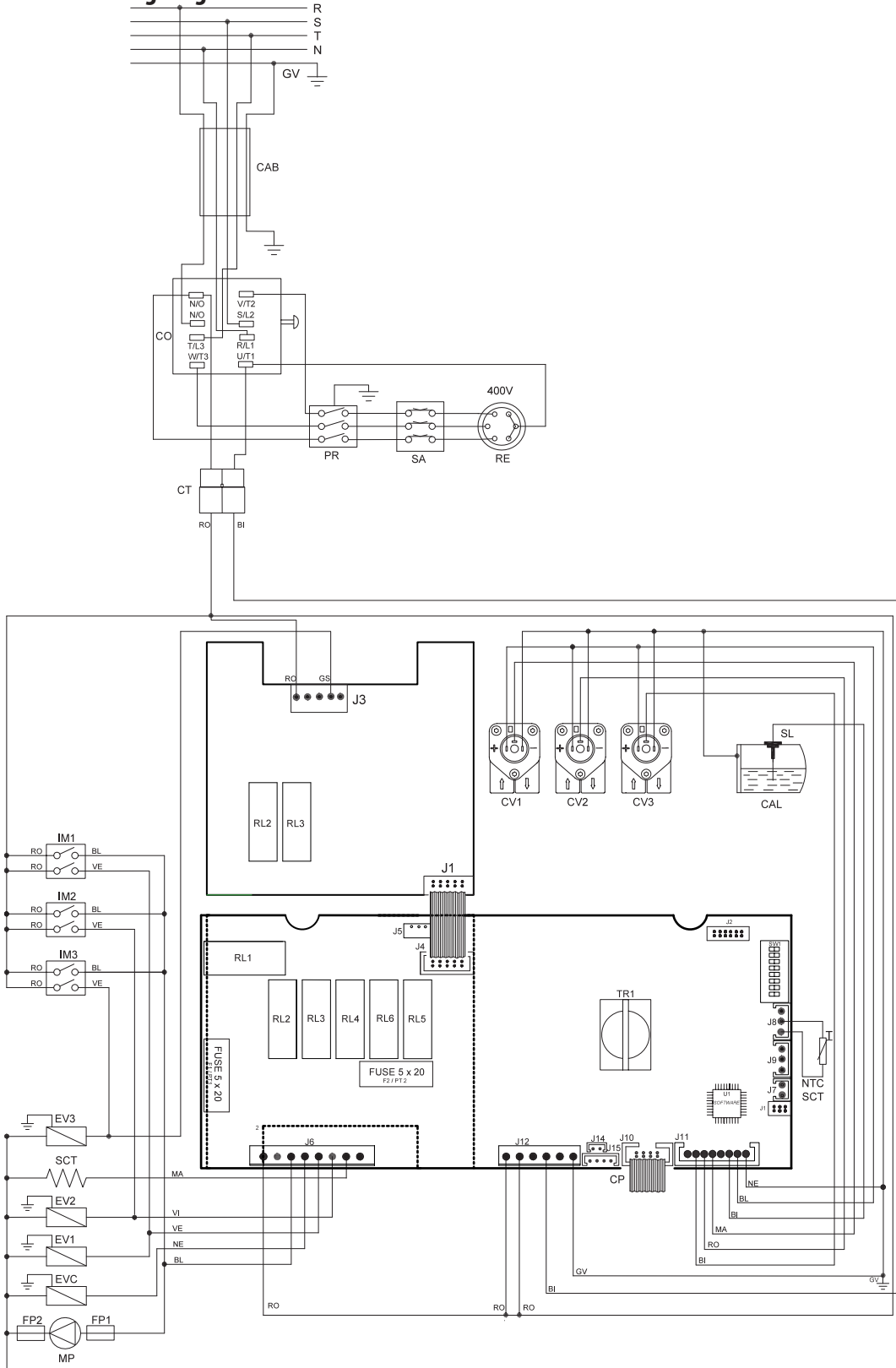
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CT	Supply connection
DV	Deviator
EVC	Boiler filling solenoid valve
EVG	Group solenoid valve
EVT	Tea solenoid valve
GR	Grey
GS	Grey-red
GV	Yellow-green
IN	Switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PG	Group button
PO	Jumper
PR	Pressure switch
PT	Tea button
RE	Resistance
RIS	Heating
RO	Red
SA	Resistance safety device
SD	Reed sensor
SH	Indicator light for lack of water
SL	Boiler level probe
SR	Heating light
TS	Safety thermostat
VE	Green

14.5.14 Wiring diagram cod.18090067-18090068 *CKXE* 120-230V*



BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CT	Supply connection
DV	Deviator
EVC	Boiler filling solenoid valve
EVG	Group solenoid valve
EVT	Tea solenoid valve
GR	Grey
GS	Grey-red
GV	Yellow-green
IN	Switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PG	Group button
PO	Jumper
PR	Pressure switch
PT	Tea button
RE	Resistance
RIS	Heating
RO	Red
SA	Resistance safety device
SD	Reed sensor
SH	Indicator light for lack of water
SL	Boiler level probe
SR	Heating light
TS	Safety thermostat
VE	Green

14.5.15 Wiring diagram cod. 18088000 - 18088001



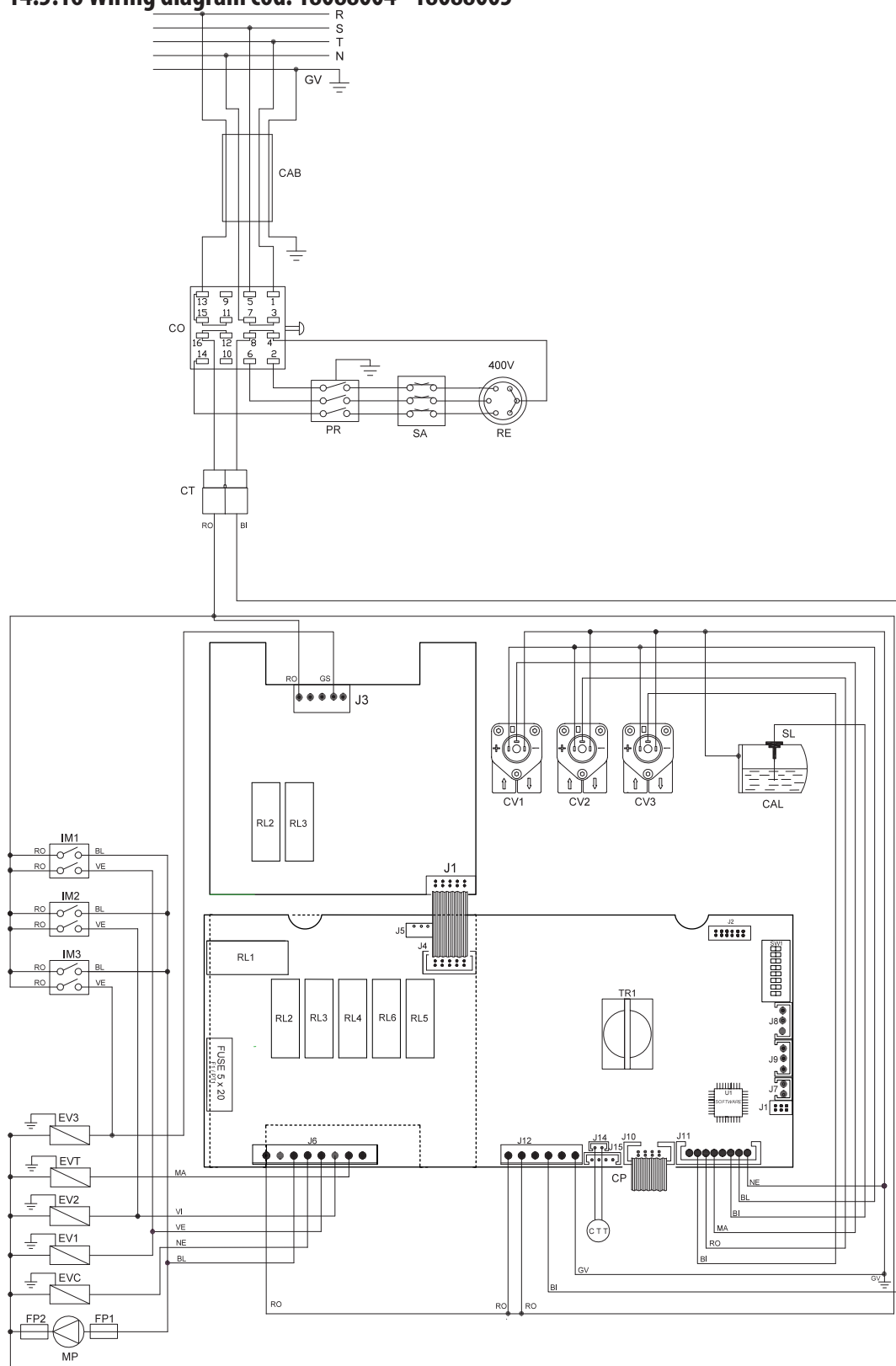
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CC	Power cable
CO	Power switch
CP	Push button panel cable
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
F1	Motor pump fuse
F2	Cup heater fuse
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GS	Dark yellow
GV	Yellow-green
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
MA	Brown
MP	Motor pump
NE	Black
NTC	NTC cup heater
PR	Pressure switch
RE	Resistance
RL1	Motor pump relay
RL2	Boiler solenoid valve relay
RL3	Solenoid valve relay GR1
RL4	Solenoid valve relay GR2
RL5	Cup heater relay
RL6	Remote switch relay
RO	Red
SA	Resistance safety device
SCT	Cup heater heating element
SL	Level probe
TR1	Transformer
VE	Green
VI	Violet
J1	Programming connector
J2	RTC expansion (not used)
J4	Relay expansion (3GR used)
J5	Serial connection
J6	Service outputs
J7	Boiler NTC (not used)
J8	Cup heater NTC (used)
J9	Autosteamer NTC (not managed)
J10	Keyboards
J11	Low voltage
J12	Power supply
J14	Water button (not used)
J15	Steam button (not managed)

SW	FUNCTION	SWITCH ON	SWITCH OFF	PRE-DETERMINED POSITION
SW1	Serial transmission	Enabled	Disabled	OFF
SW2	Boiler filling	With pump	Without pump	ON
SW3	Dispensing hot water	With pump	Without pump	OFF
SW4	Pre-infusion	Enabled	Disabled	OFF
SW5	Keyboards semi-automatic key	Enabled	Disabled	OFF
SW6	Cup heater	Enabled	Disabled	ON
SW7	400V Alarm	Enabled	Disabled	ON
SW8	Not managed			OFF

(*) Fuses for UL versions with plug with a greater capacity than 30A

Relay expansion board	
RL1	Not managed
RL2	Solenoid valve relay GR3
RL3	Solenoid valve relay GR4
RL4	Not managed
RL5	Not managed
RL6	Not managed
J1	Connection to the control unit
J3	GR3 and GR4 outlets

14.5.16 Wiring diagram cod. 18088004 - 18088005



BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CC	Power cable
CO	Power switch
CP	Push button panel cable
CT	Supply connection
CTT	Tea button connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
F1	Motor pump fuse
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GS	Dark yellow
GV	Yellow-green
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
MA	Brown
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RL1	Motor pump relay
RL2	Boiler solenoid valve relay
RL3	Solenoid valve relay GR1
RL4	Solenoid valve relay GR2
RL5	Cup heater relay
RL6	Remote switch relay
RO	Red
SA	Resistance safety device
SL	Level probe
TR1	Transformer
VE	Green
VI	Violet
J1	Programming connector
J2	RTC expansion (not used)
J4	Relay expansion (3GR used)
J5	Serial connection
J6	Service outputs
J7	Boiler NTC (not used)
J8	Cup heater NTC (used)
J9	Autosteamer NTC (not managed)
J10	Keyboards
J11	Low voltage
J12	Power supply
J14	Water button (not used)
J15	Steam button (not managed)

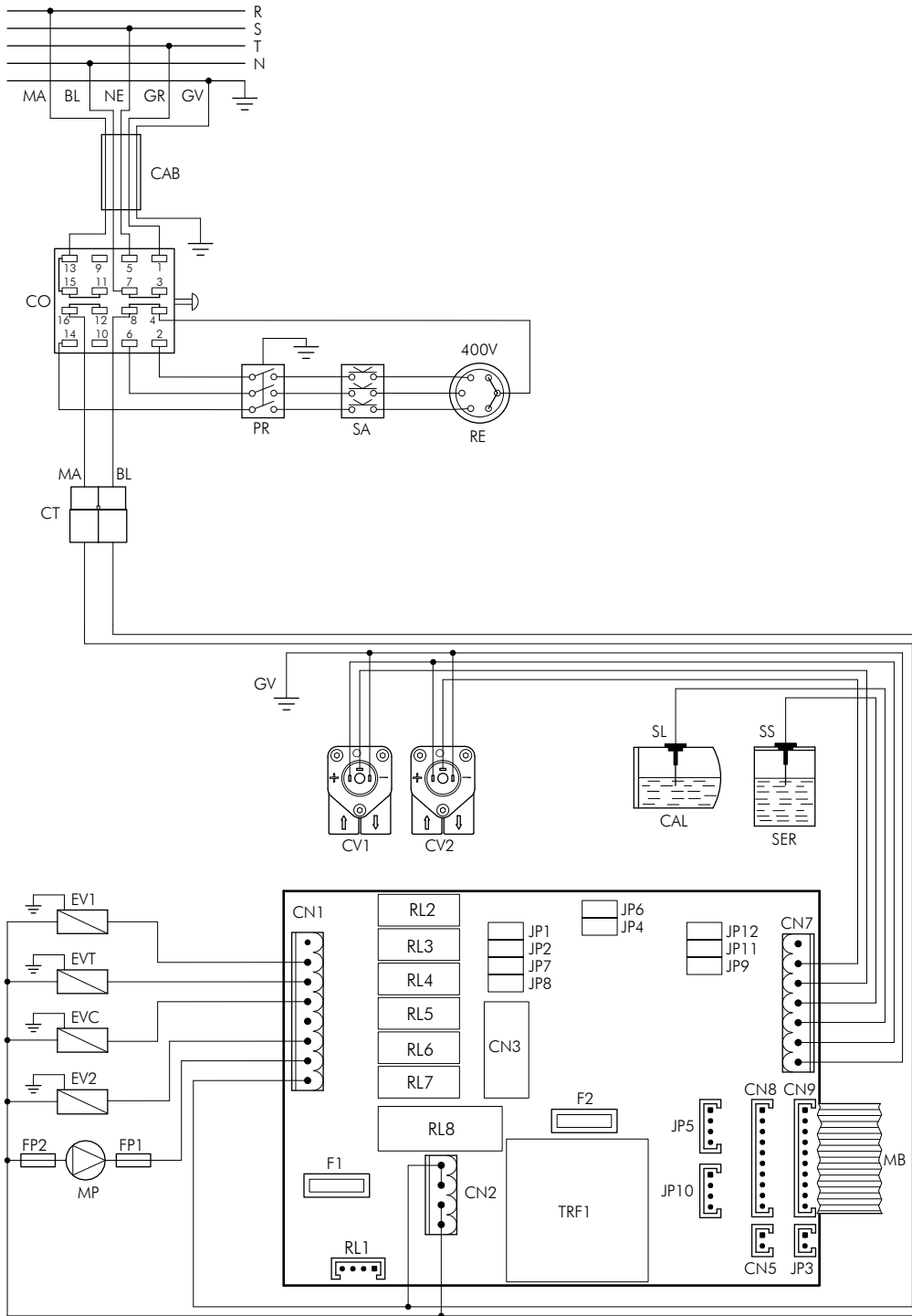
SW	FUNCTION	SWITCH ON	SWITCH OFF	PRE-DETERMINED POSITION
SW1	Serial transmission	Enabled	Disabled	OFF
SW2	Boiler filling	With pump	Without pump	ON
SW3	Dispensing hot water	With pump	Without pump	OFF
SW4	Pre-infusion	Enabled	Disabled	OFF
SW5	Keyboards semi-automatic key	Enabled	Disabled	OFF
SW6	Not managed			OFF
SW7	400V Alarm	Enabled	Disabled	ON
SW8	Not managed			OFF

(*) Fuses for UL versions with plug with a greater capacity than 30A

Relay expansion board

RL1	Not managed
RL2	Solenoid valve relay GR3
RL3	Solenoid valve relay GR4
RL4	Not managed
RL5	Not managed
RL6	Not managed
J1	Connection to the control unit
J3	GR3 and GR4 outlets

14.5.17 Wiring diagram cod. 18090130 - 18090146

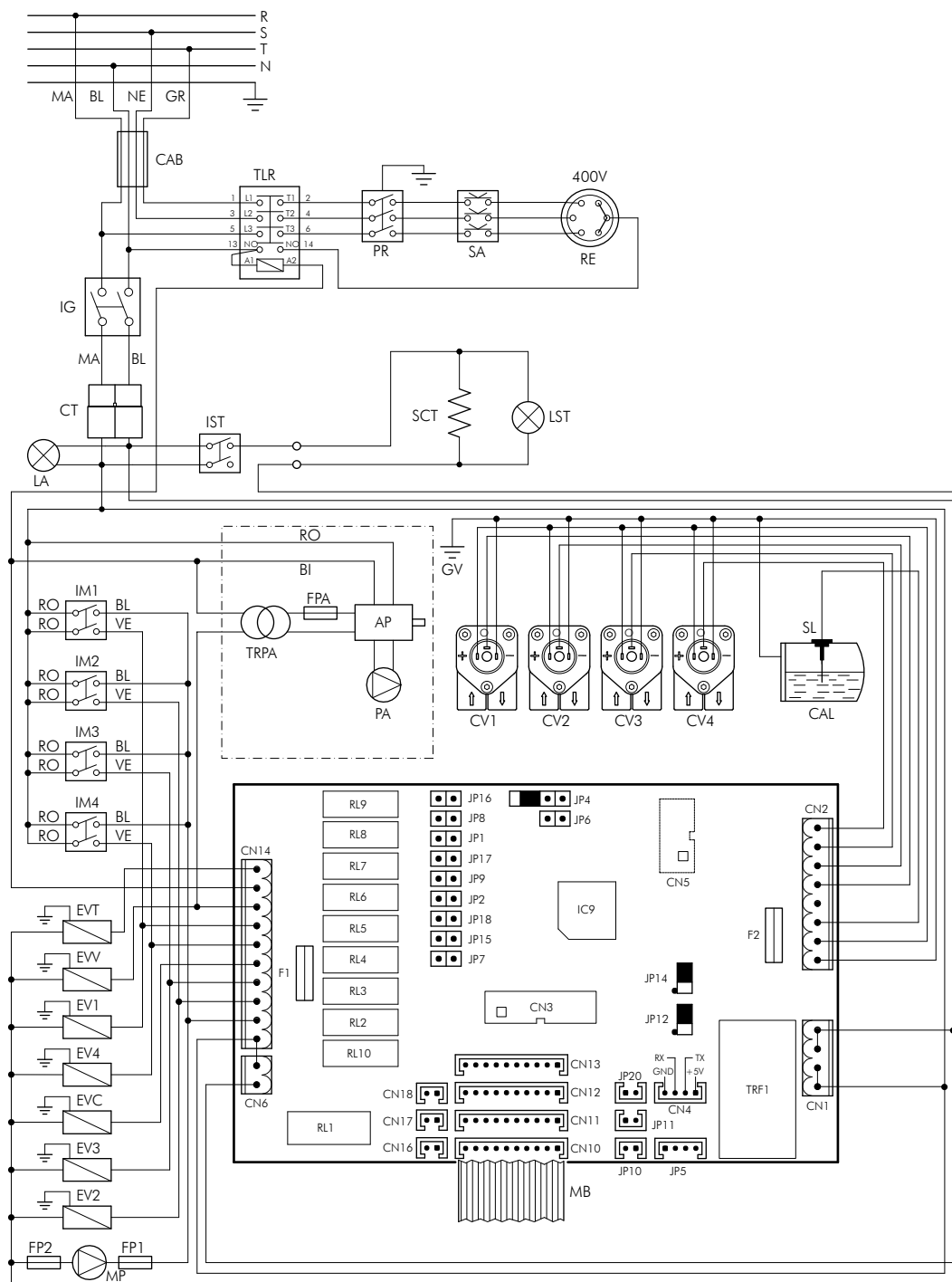


BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Service outputs connector
CN2	Supply connection
CN3	Programming connector
CN5	Boiler NTC probe
CN7	Low voltage connector
CN8	Push button panel connector GR2
CN9	Push button panel connector GR1
CO	Power switch
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (10A)
F2	Motor pump fuse (500mA)
FP1(*)	Motor pump UL (OPD) fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Resistance
RL3	Solenoid valve relay GR1
RL4	Tea solenoid valve relay
RL5	Boiler solenoid valve relay
RL7	Solenoid valve relay GR2
RL8	Pump relay
RO	Red
SA	Resistance safety device
SE	Tank
SL	Boiler level probe
SS	Tank level probe
TRF1	Transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	RS232 serial port enabled	RS232 serial port disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP6	Tea dispensing with pump	Tea dispensing without pump
JP7	Continuous function enabled	Continuous function disabled
JP8	Not used.	
JP9	Temperature control enabled	Temperature control disabled
JP11	Time lag at 2°C	Time lag at 4°C
JP12	Water supply from the tank	Water supply from the mains

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.18 Wiring diagram cod. 18090171 - 18090172

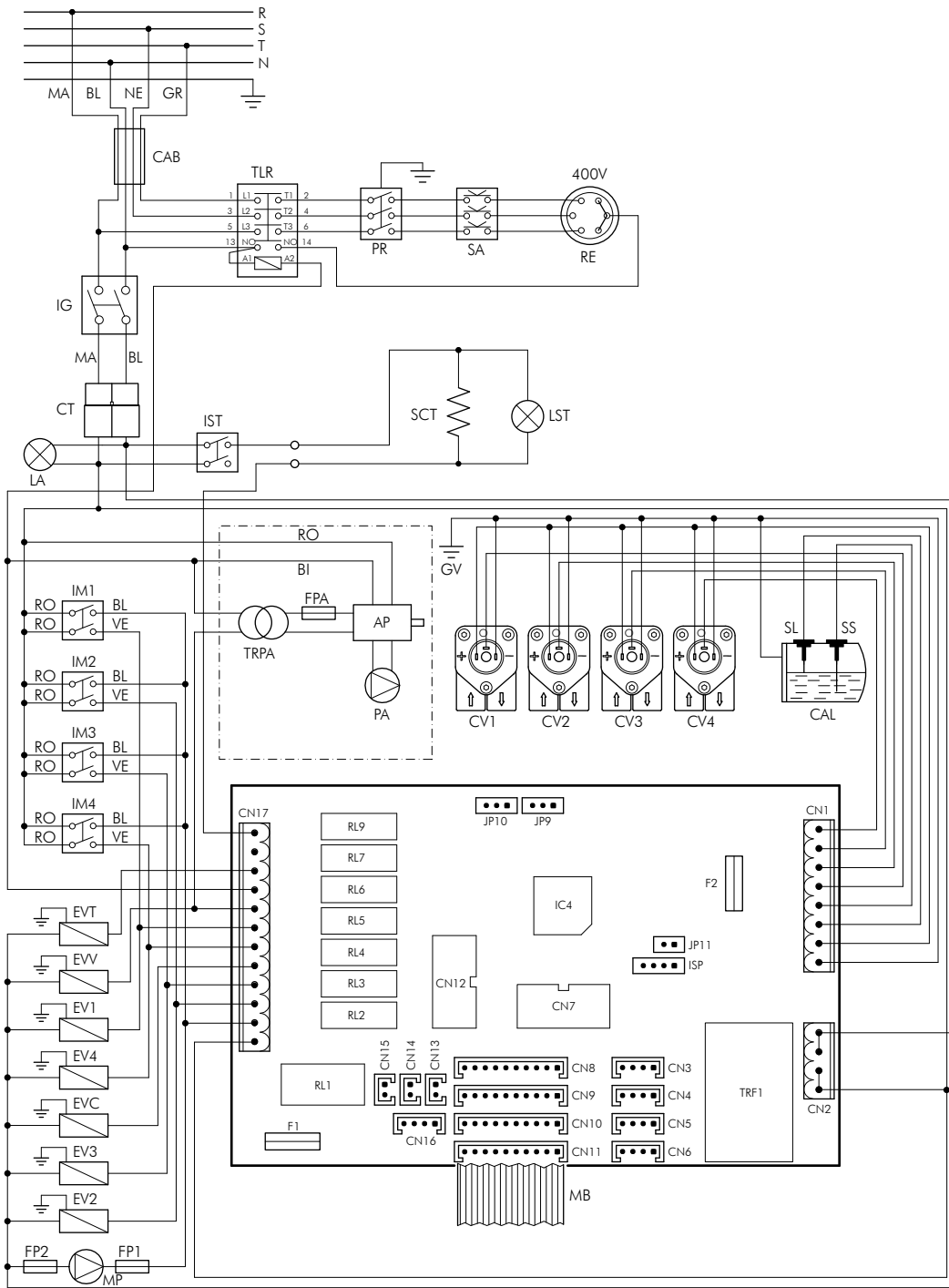


AP	Air pump supply
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Supply connection
CN2	Low voltage connector
CN3	Display.diagr. connector
CN4	Serial transmission connector
CN5	Programm. connector ISP
CN6	Cup heater heating el. connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN13	Push button panel connector GR4
CN14	Service outputs connector
CN16	NTC autosteamer connector
CN17	NTC boiler connector
CN18	NTC cup heater connector
CPA	Air pump connector
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	Motor pump UL (OPD) fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IC9	Microprocessor
IG	Main switch
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IM4	GR4 manual switch
IST	Cup heater switch
LA	Indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
PA	Vcc air pump
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SCT	Cup heater heating element
SL	Level probe
TLR	Remote switch
TRF1	Transformer
TRPA	Air pump transformer
VE	Green

JUMPER	INSERTED	NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP6	Tea dispensing with pump	Tea dispensing without pump
JP7	Continuous function disabled	Continuous function enabled
JP8	Dose count enabled	Dose count disabled
JP9	Credit/Debit enabled	Credit/Debit disabled
JP15	Display function keys enabled	Display function keys disabled
JP16	6-key push button panel enabled	4-key push button panel enabled
JP17	Boiler t°check with external pressure switch (always on)	
JP18	Heat.temp./press. management always ON	

(*) Fuses for UL versions with plug with a greater capacity than 30A

14.5.19 Wiring diagram cod. 18090161 - 18090162



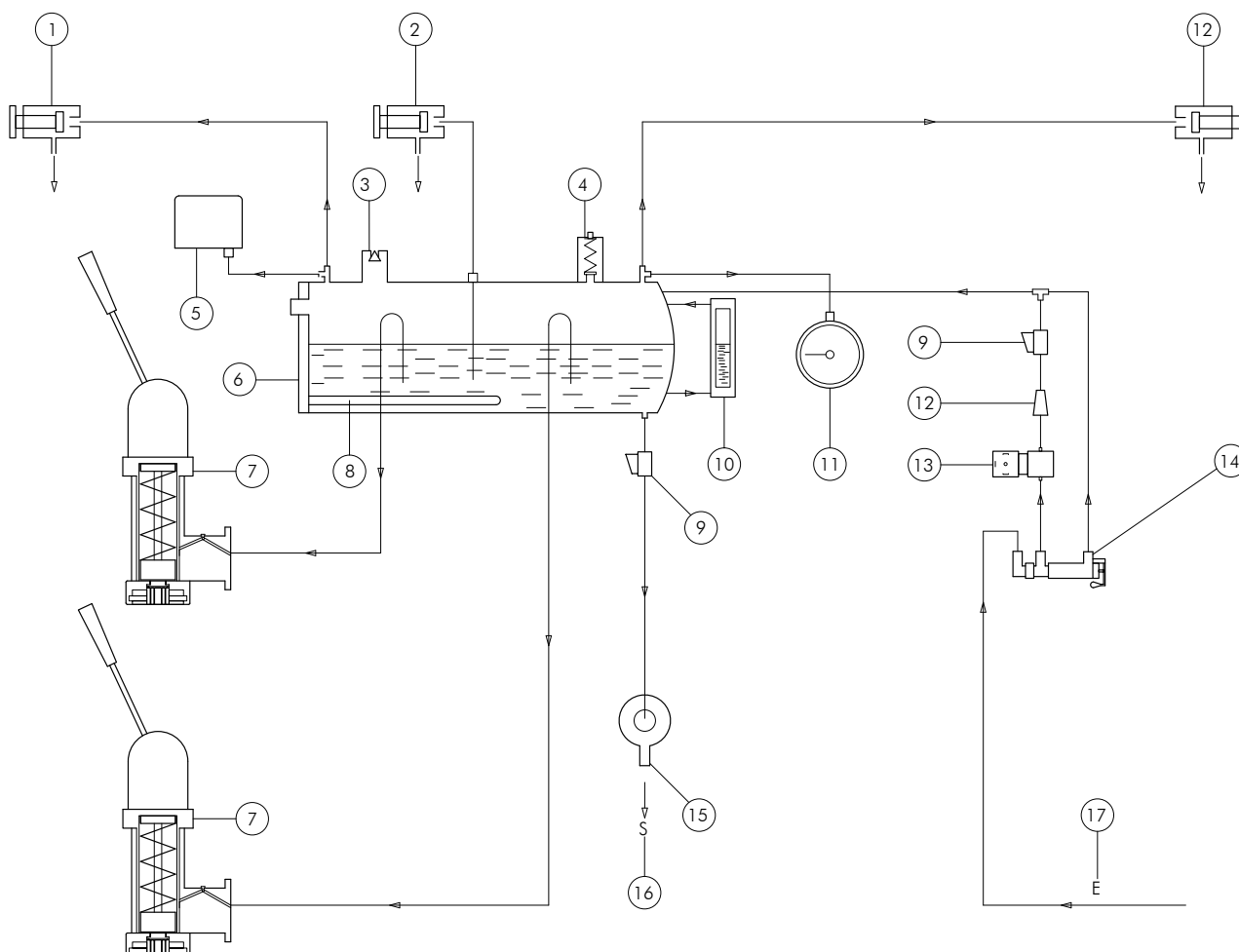
JUMPER	INSERTED
JP9	TX RS232 signal inversion
JP10	RX RS232 signal inversion
JP11	Enable reset micro management

(*) Fuses for UL versions with plug with a greater capacity than 30A

AP	Air pump supply
BI	White
BL	Blue
CAB	Power cable
CAL	Boiler
CN1	Low voltage connector
CN2	Supply connection
CN3	Autosteamer connector
CN4	Tea connector
CN5	Serial transmission connector
CN6	Serv. boiler press. connector
CN7	Autosteamer connector
CN8	Push button panel connector GR4
CN9	Push button panel connector GR3
CN10	Push button panel connector GR2
CN11	Push button panel connector GR1
CN12	Serial display connector
CN13	NTC milk connector
CN14	NTC boiler connector
CN15	NTC cup heater connector
CN16	Water mains press. connector
CT	Supply connection
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
F1	Inlet fuse (6.3A)
F2	Motor pump fuse (500mA)
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230V
GR	Grey
GV	Yellow-green
IG	Main switch
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IM4	GR4 manual switch
IST	Cup heater switch
LA	Indicator light
LST	Cup warmer indicator light
MA	Brown
MB	Push button panel membrane
MP	Motor pump
NE	Black
PA	Vcc air pump
PR	Pressure switch
RE	Resistance
RO	Red
SA	Resistance safety device
SCT	Cup heater heating element
SL	Level probe
SA	Safety probe
TLR	Remote switch
TRF1	Transformer
TRPA	Air pump transformer
VE	Green

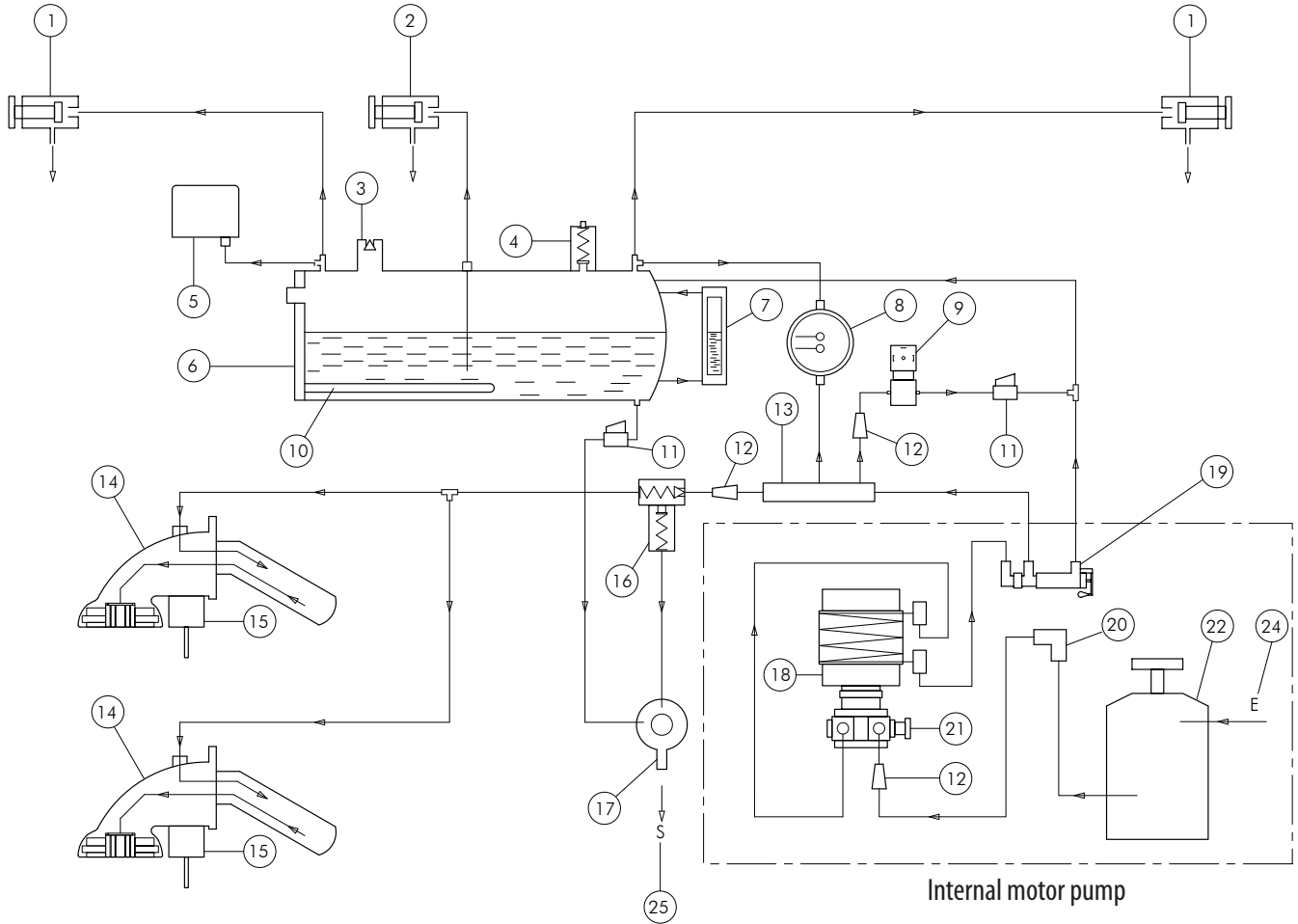
15. HYDRAULIC DIAGRAMS

15.1 LEVER GROUP hydraulic diagram

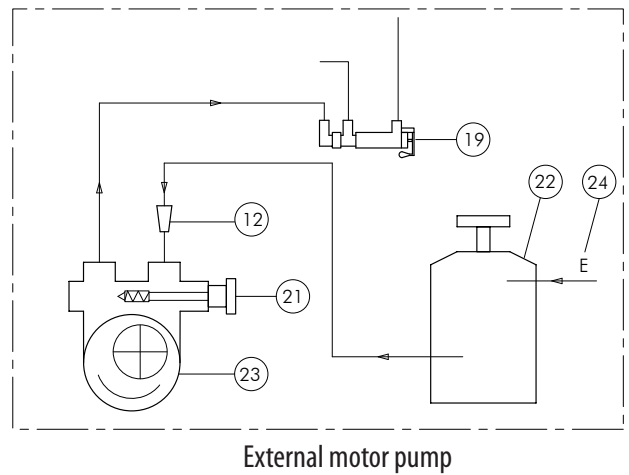


1	Steam cock
2	Hot water tap
3	Negative pressure valve
4	Safety valve
5	Pressure switch
6	Boiler
7	Dispensing group
8	Boiler heating element
9	Tap
10	Optical level
11	Pressure gauge
12	Water inlet filter
13	Automatic Water Entry solenoid valve (optional)
14	Manual water entry tap
15	Discharge tub
16	Drain
17	Water inlet

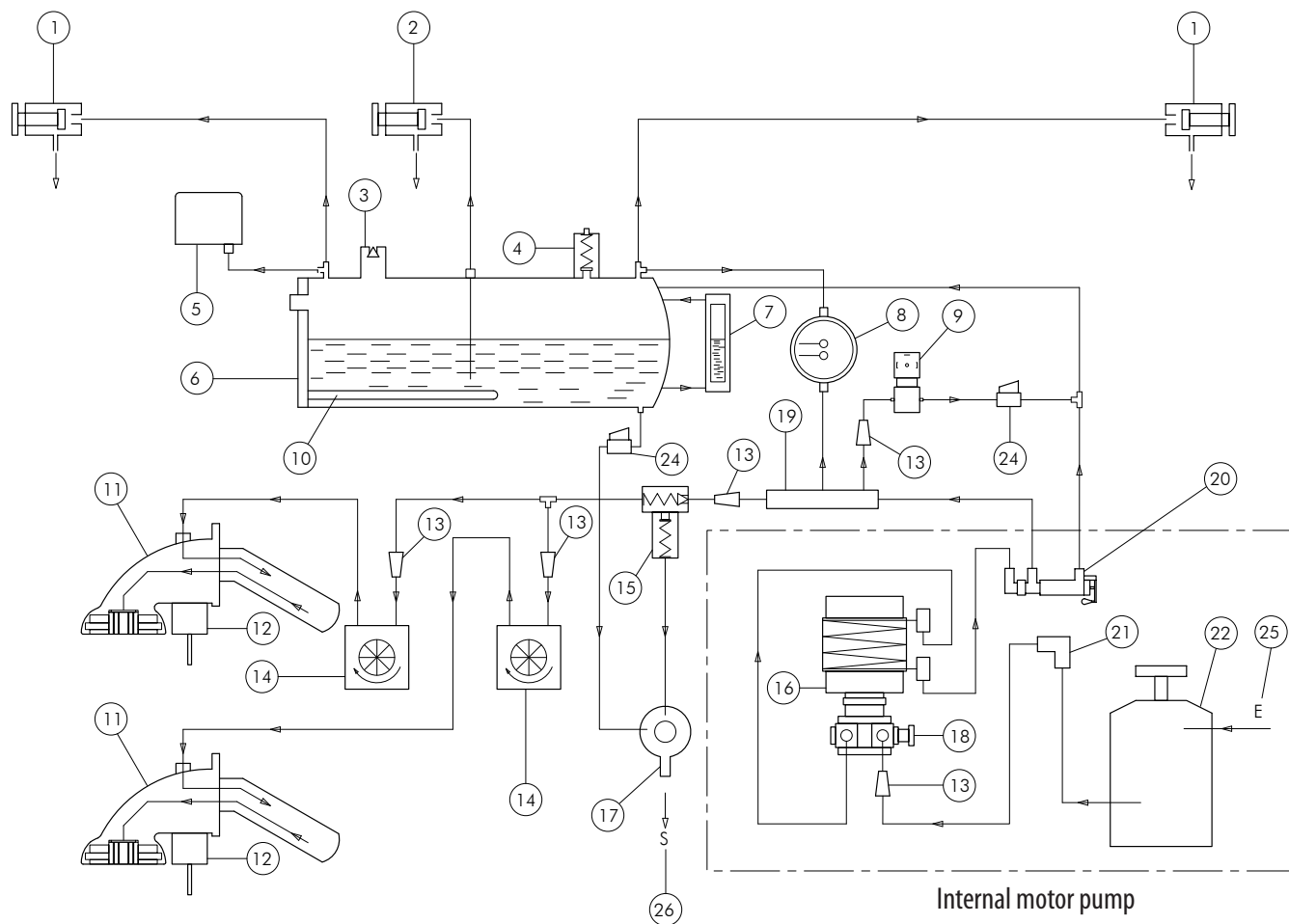
15.2 AEP EXTRACTABLE EXCHANGER hydraulic diagram



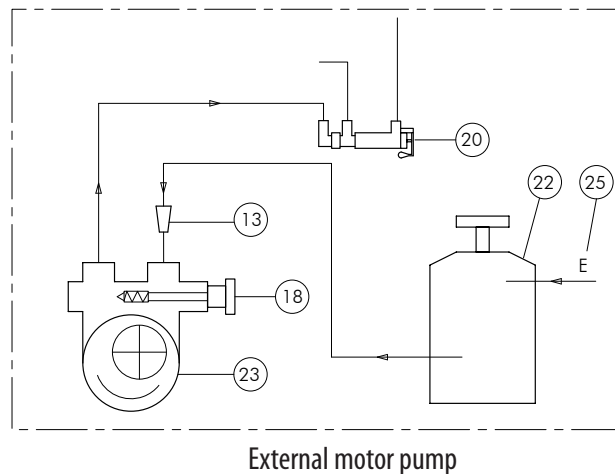
1	Steam cock
2	Hot water tap
3	Negative pressure valve
4	Safety valve
5	Pressure switch
6	Boiler
7	Optical level
8	Pressure gauge
9	Automatic Water Entry Solenoid Valve
10	Boiler heating element
11	Boiler drain tap
12	Water inlet filter
13	Water dispenser
14	Dispensing group
15	Group solenoid valve
16	SCNR valve
17	Discharge tub
18	Built-in motor pump
19	Manual water entry tap
20	Water inlet connection
21	Pump pressure adjustment
22	Water softener
23	External motor pump
24	Water inlet
25	Drain



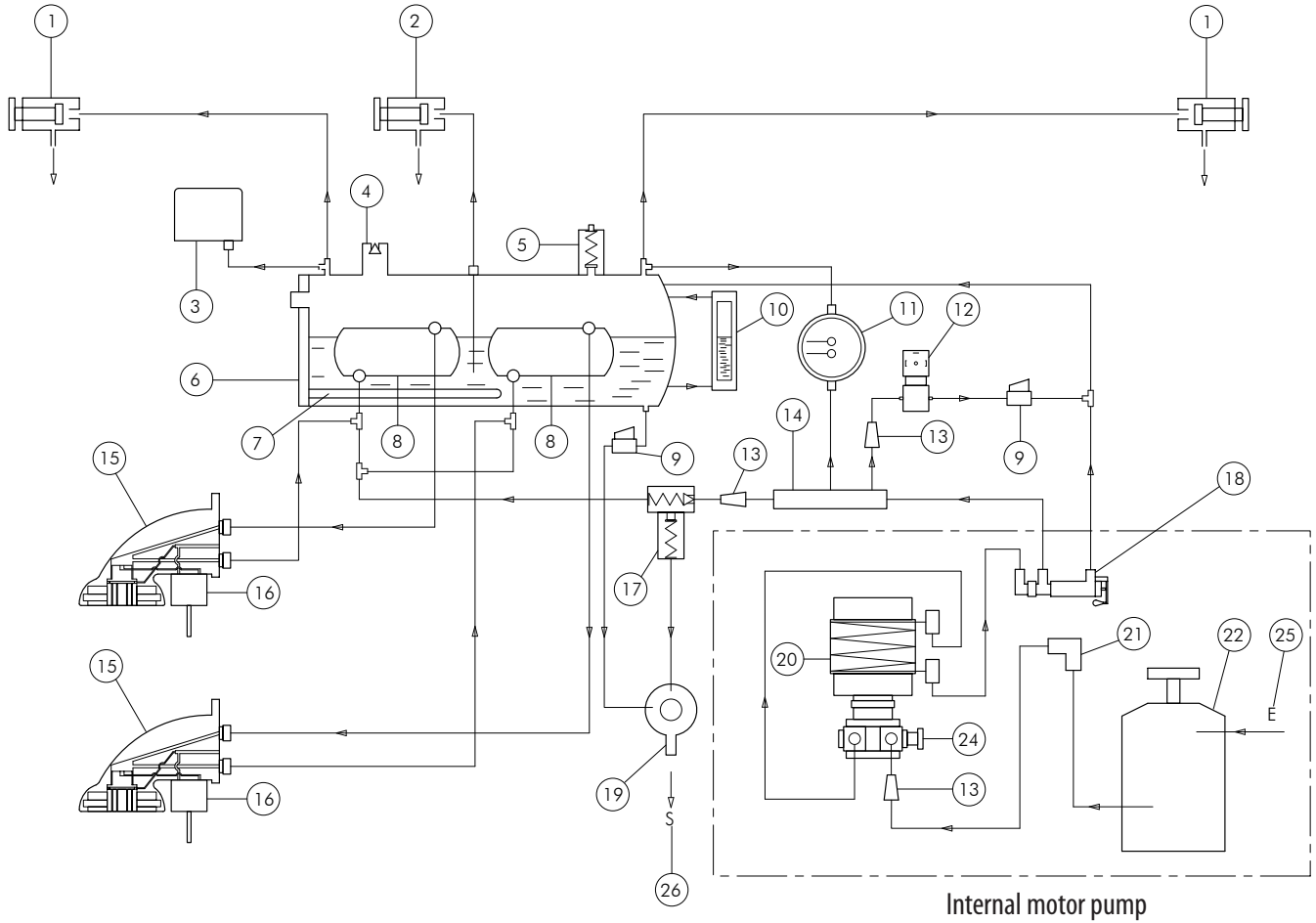
15.3 SAE EXTRACTABLE EXCHANGER hydraulic diagram



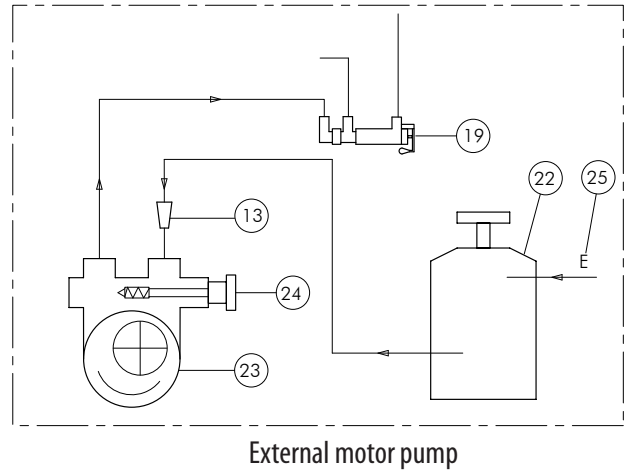
1	Steam cock
2	Hot water tap
3	Negative pressure valve
4	Safety valve
5	Pressure switch
6	Boiler
7	Optical level
8	Pressure gauge
9	Automatic Water Entry Solenoid Valve
10	Boiler heating element
11	Dispensing group
12	Group solenoid valve
13	Water inlet filter
14	Volumetric dosing device
15	SCNR valve
16	Built-in motor pump
17	Boiler drain tap
18	Pump pressure adjustment
19	Water dispenser
20	Manual water entry tap
21	Water inlet connection
22	Water softener
23	External motor pump
24	Boiler drain tap
25	Water inlet
26	Drain



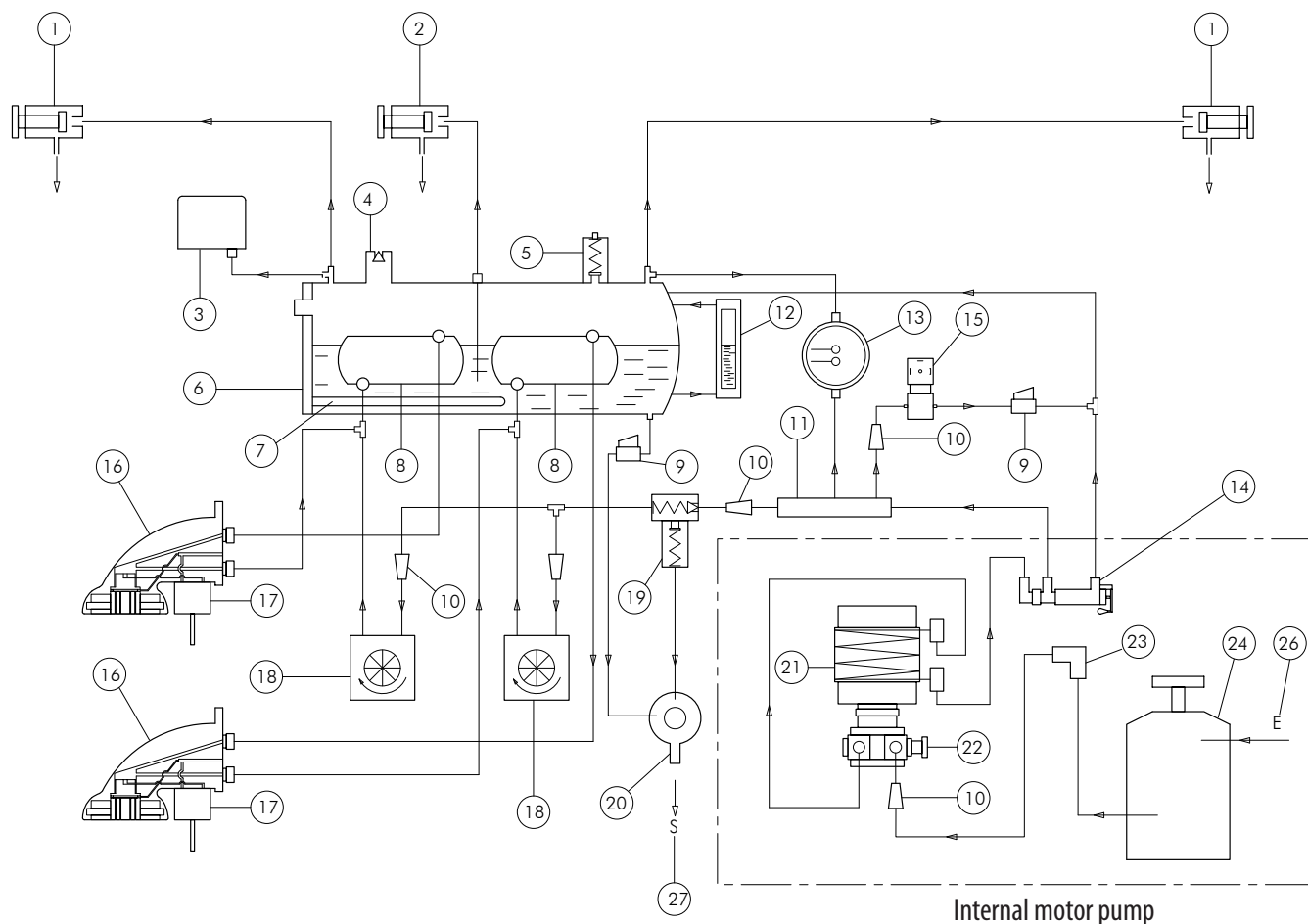
15.4 CTS ARP system hydraulic diagram



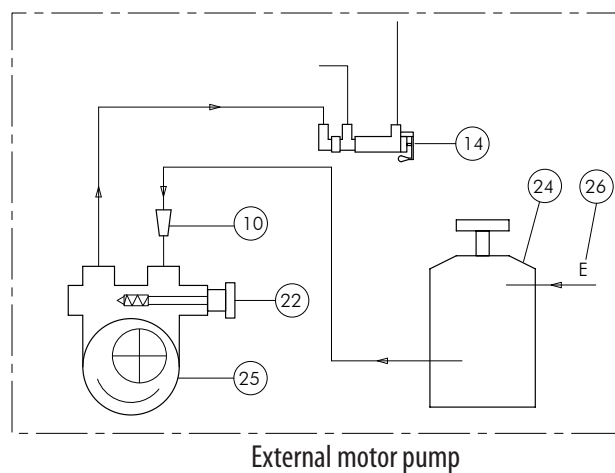
1	Steam cock
2	Hot water tap
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Boiler
7	Boiler heating element
8	Heat exchanger
9	Boiler drain tap
10	Optical level
11	Pressure gauge
12	Automatic Water Entry Solenoid Valve
13	Water inlet filter
14	Water dispenser
15	Dispensing group
16	Group solenoid valve
17	SCNR valve
18	Manual water entry tap
19	Discharge tub
20	Built-in motor pump
21	Water inlet connection
22	Water softener
23	External motor pump
24	Pump pressure adjustment
25	Water inlet
26	Drain



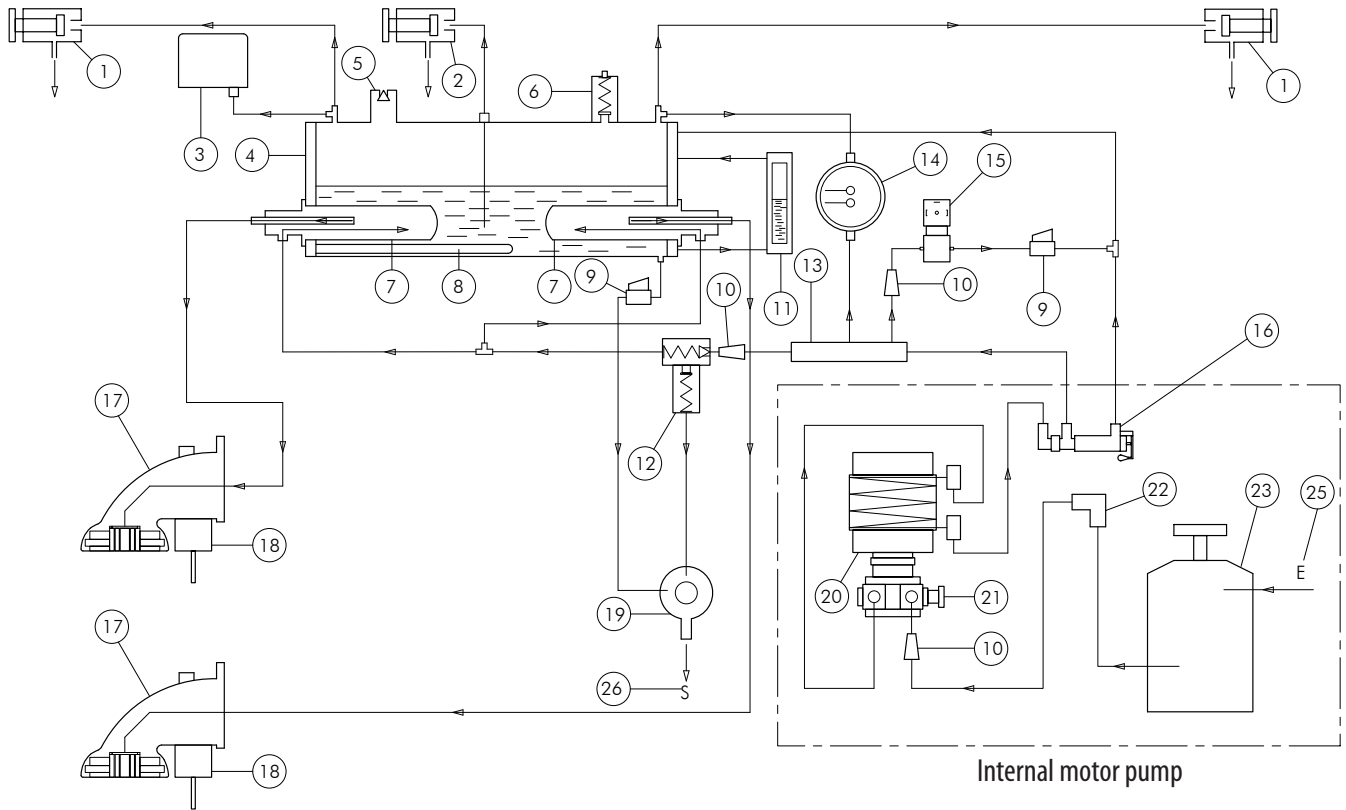
15.5 CTS SAE system hydraulic diagram



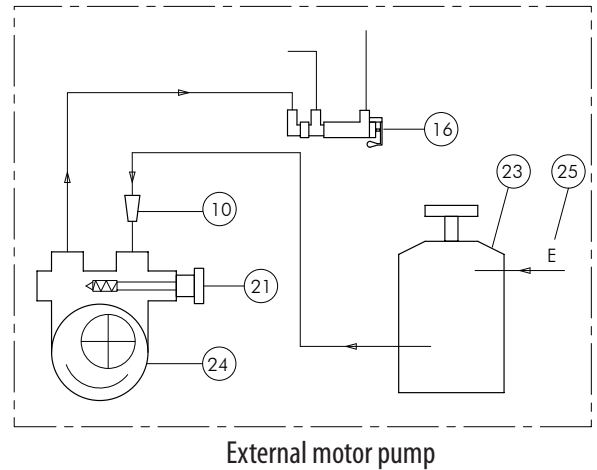
1	Steam cock
2	Hot water tap
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Boiler
7	Boiler heating element
8	Heat exchanger
9	Boiler drain tap
10	Optical level
11	Pressure gauge
12	Automatic Water Entry Solenoid Valve
13	Water inlet filter
14	Water dispenser
15	Dispensing group
16	Group solenoid valve
17	SCNR valve
18	Manual water entry tap
19	Discharge tub
20	Built-in motor pump
21	Water inlet connection
22	Water softener
23	External motor pump
24	Pump pressure adjustment
25	Water inlet
26	Drain
27	



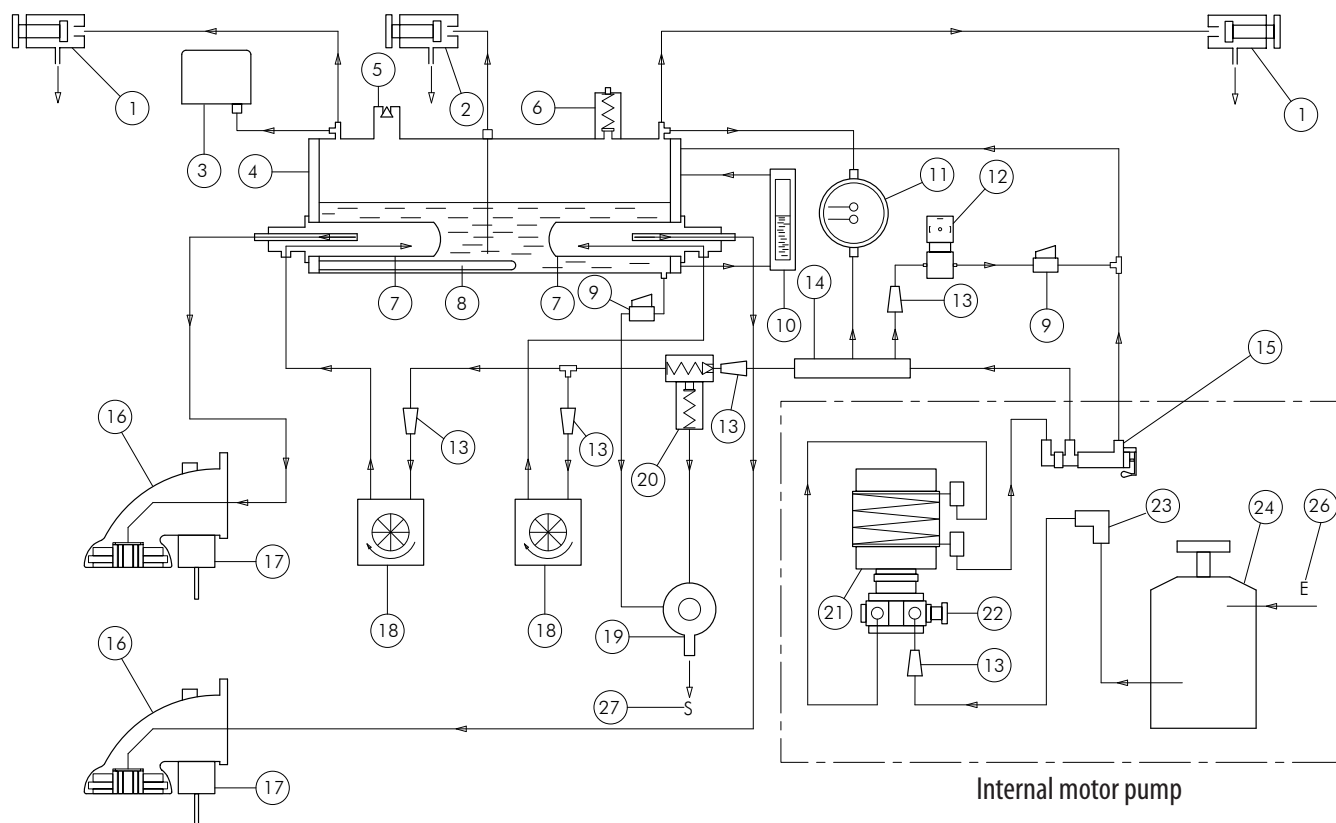
15.6 BOOSTED ARP system hydraulic diagram



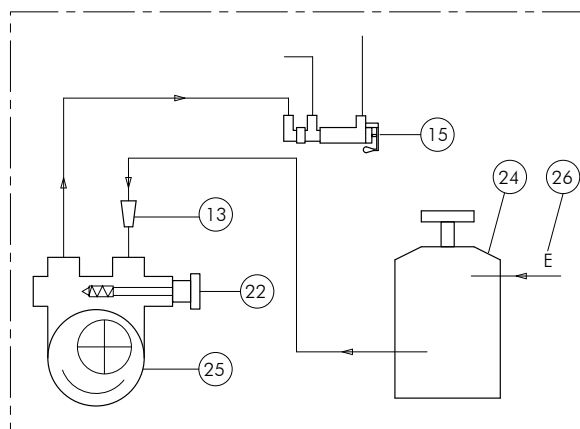
1	Steam cock
2	Hot water tap
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Boiler
7	Boiler heating element
8	Heat exchanger
9	Boiler drain tap
10	Optical level
11	Pressure gauge
12	Automatic Water Entry Solenoid Valve
13	Water inlet filter
14	Water dispenser
15	Dispensing group
16	Group solenoid valve
17	SCNR valve
18	Manual water entry tap
19	Discharge tub
20	Built-in motor pump
21	Water inlet connection
22	Water softener
23	External motor pump
24	Pump pressure adjustment
25	Water inlet
26	Drain



15.7 SAE BOOSTED SYSTEM hydraulic diagram



Internal motor pump



External motor pump

1	Steam cock
2	Hot water tap
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Boiler
7	Boiler heating element
8	Heat exchanger
9	Boiler drain tap
10	Optical level
11	Pressure gauge
12	Automatic Water Entry Solenoid Valve
13	Water inlet filter
14	Water dispenser
15	Dispensing group
16	Group solenoid valve
17	SCNR valve
18	Manual water entry tap
19	Discharge tub
20	Built-in motor pump
21	Water inlet connection
22	Water softener
23	External motor pump
24	Pump pressure adjustment
25	Water inlet
26	Drain

16. CREDIT - DEBIT SYSTEM

16.1 Installation

The CREDIT-DEBIT function is active in the PLUS1 electronic control units with the code 18090047-18090048 (without display), PLUS2 with code 18090079-18090080 (with display) and PLUS3 with code 18090051-18090052 (model with cappuccino /autosteamer) with software program dated 20/05/2005 or later.

For installation proceed as follows:

- Turn the machine off;
- activate mobile jumpers JP1 and JP9 as shown in the electrical diagram;
- activate jumpers JP12 and JP14 as shown in the electrical diagram;
- connect the supplied cable CC (code 22556005) to the CN4 dedicated connector of the CE electronic board and to the M signal converter (cod. 22556003);
- connect with a standard CS serial cable with code 22556004 (max 15 meters) to the M signal converter (cod. 22556003) and connect the other end to the cash register;
- start the machine again.



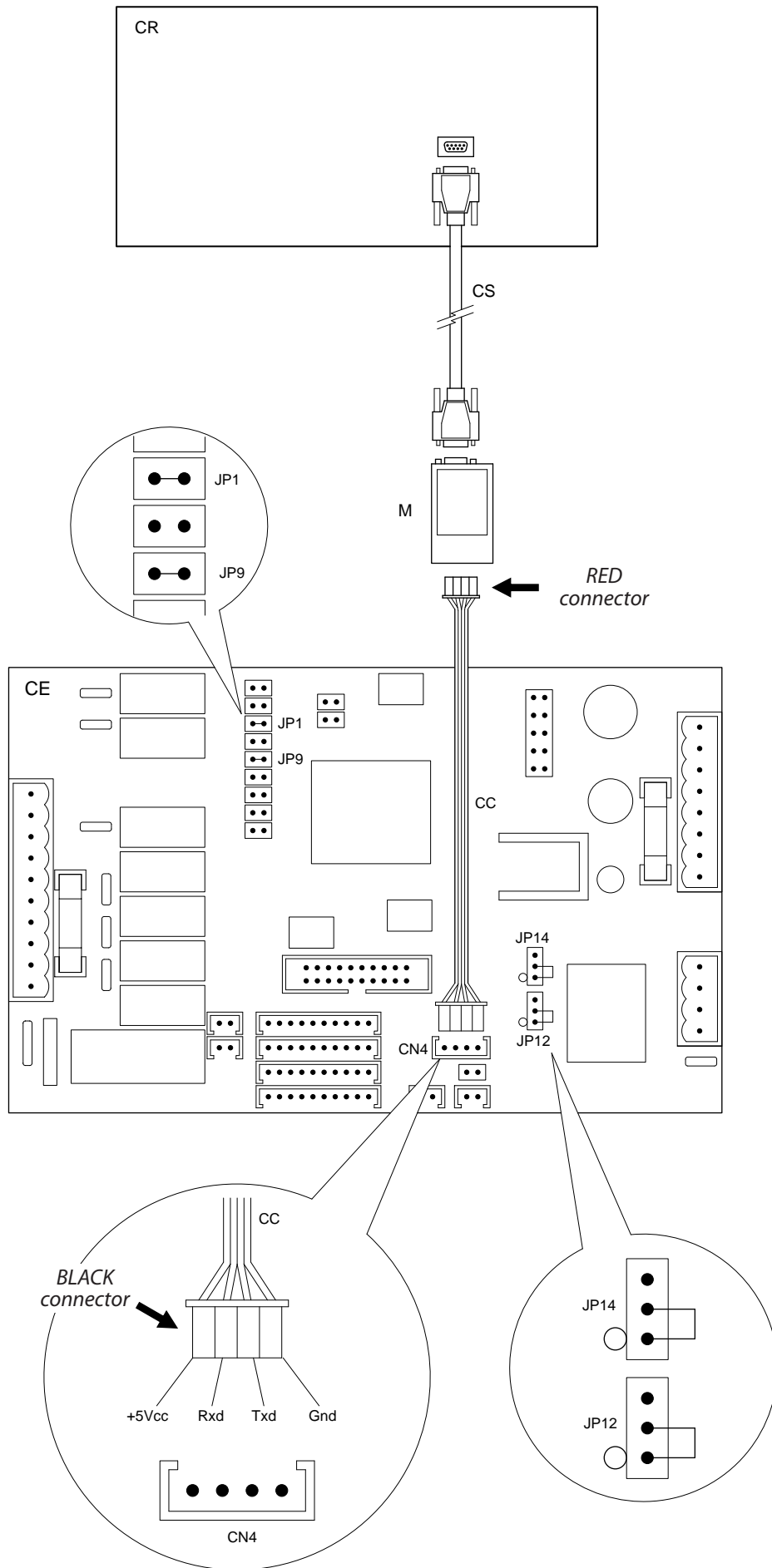
In machines with a software program dated 23/06/04 or earlier, the control unit must be replaced.

The cash register management software and the standard serial cable CS (maximum length 15 metres) are not the responsibility of the manufacturer. Response from the till timeout: 1 second.

Programming of doses can be performed without having to disconnect the Credit-Debit device.

If the cash register is enabled, programmed doses are counted. To prevent counting, de-activate jumper JP1 prior to programming.

CC	Supplied serial connection cable cod. 22556005
CS	Serial transmission cable not supplied cod. 22556004 (max15 mt)
CN4	Serial transmission connector
CR	Cash register
CE	Electronic control unit: - Plus1 cod. 18090047-48 - Plus2 cod. 18090079-80 - Plus3 cod. 18090051-52
M	Signal converter, cod. 22556003



16.2 Communication protocol

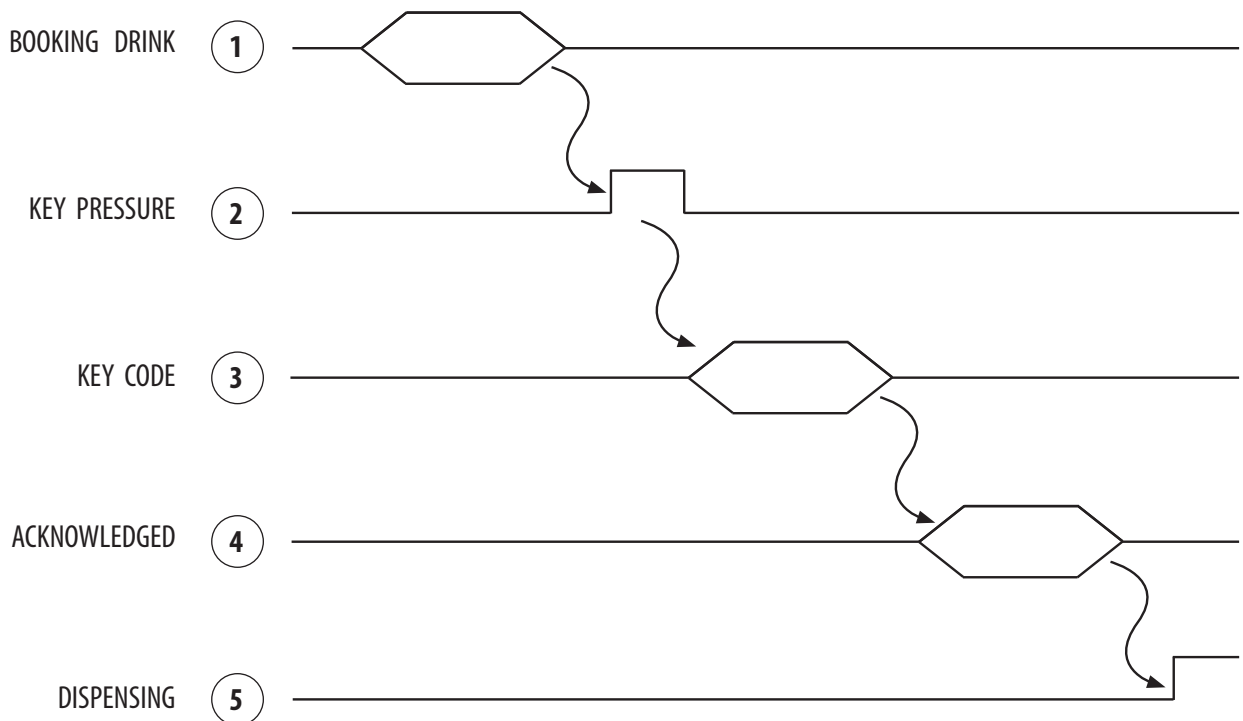
Description of the operating principle with reference to the diagram shown below:

- order the beverage at the cash register;
- the cash register sends the selection code to the machine;
- select the ordered dose on the coffee machine;
- the code that corresponds to the selection is sent to the cash register (see codes table);
- the cash register replies ACK=06H thus enabling dispensing;
- the coffee machine delivers the beverage.

If the cash register does not identify the code, there is no enabling and the dispensing is not made, the cash register sends the NACK=15H code



Baud rate: 1200, 8 bit + 1 bit Stop. Parity N (none)



16.3 Beverages selection codes table

DESCRIPTION	SIGNAL	RELAY	I/O CONNECTOR REF.
1 Espresso GR1	011 h	1	CN7-1
1 Medium GR1	012 h	2	CN7-2
1 Large GR1	013 h	3	CN7-3
2 Espressos GR1	014 h	4	CN7-4
2 Medium GR1	015 h	5	CN7-5
2 Large GR1	016 h	6	CN7-6
1 Espresso GR2	021 h	7	CN7-7
1 Medium GR2	022 h	8	CN7-8
1 Large GR2	023 h	9	CN7-9
2 Espressos GR2	024 h	10	CN7-10
2 Medium GR2	025 h	11	CN7-11
2 Large GR2	026 h	12	CN7-12
1 Espresso GR3	031 h	13	CN7-13
1 Medium GR3	032 h	14	CN7-14
1 Large GR3	033 h	15	CN7-15
2 Espressos GR3	034 h	16	CN7-16
2 Medium GR3	035 h	17	CN7-17
2 Large GR3	036 h	18	CN7-18
1 Espresso GR4 / Cappuccino	041 h	19	CN7-19
1 Medium GR4 / Latte	042 h	20	CN7-20
1 Large GR4 / Foamed milk	043 h	21	CN7-21
2 Espressos GR4 / Warm milk	044 h	22	CN7-22
2 Medium GR4 / Milk with shot of coffee	045 h	23	CN7-23
2 Large GR4	046 h	24	CN7-24
Tea 1	051 h	25	CN7-25
Tea 2	052 h	26	CN7-26
			CN7-33 I/O enabling
			CN7-35 I/O enabling
			CN7-37 com. relay
			CN7-38 com. relay

17. DEBIT - CREDIT system with direct connection to the REGISTER

17.1 Installation

The DEBIT-CREDIT function is active in the PLUS1 electronic control units with the code 18090047-18090048 (without display), PLUS2 with code 18090079-18090080 (with display) and PLUS3 with code 18090051-18090052 (model with cappuccino / autosteamer) with software program dated 20/05/2005 or later.

For installation proceed as follows:

- Turn the machine off;
- activate mobile jumpers JP1 as shown in the electrical diagram;
- activate jumpers JP12 and JP14 as shown in the electrical diagram;
- connect the supplied cable CC (code 22556005) to the CN4 dedicated connector of the CE electronic board and to the M signal converter (cod. 22556003);
- connect with a standard CS serial cable with code 22556004 (max 15 meters) to the M signal converter (cod. 22556003) and connect the other end to the cash register;
- start the machine again.



In machines with a software program dated 23/06/04 or earlier, the control unit must be replaced.

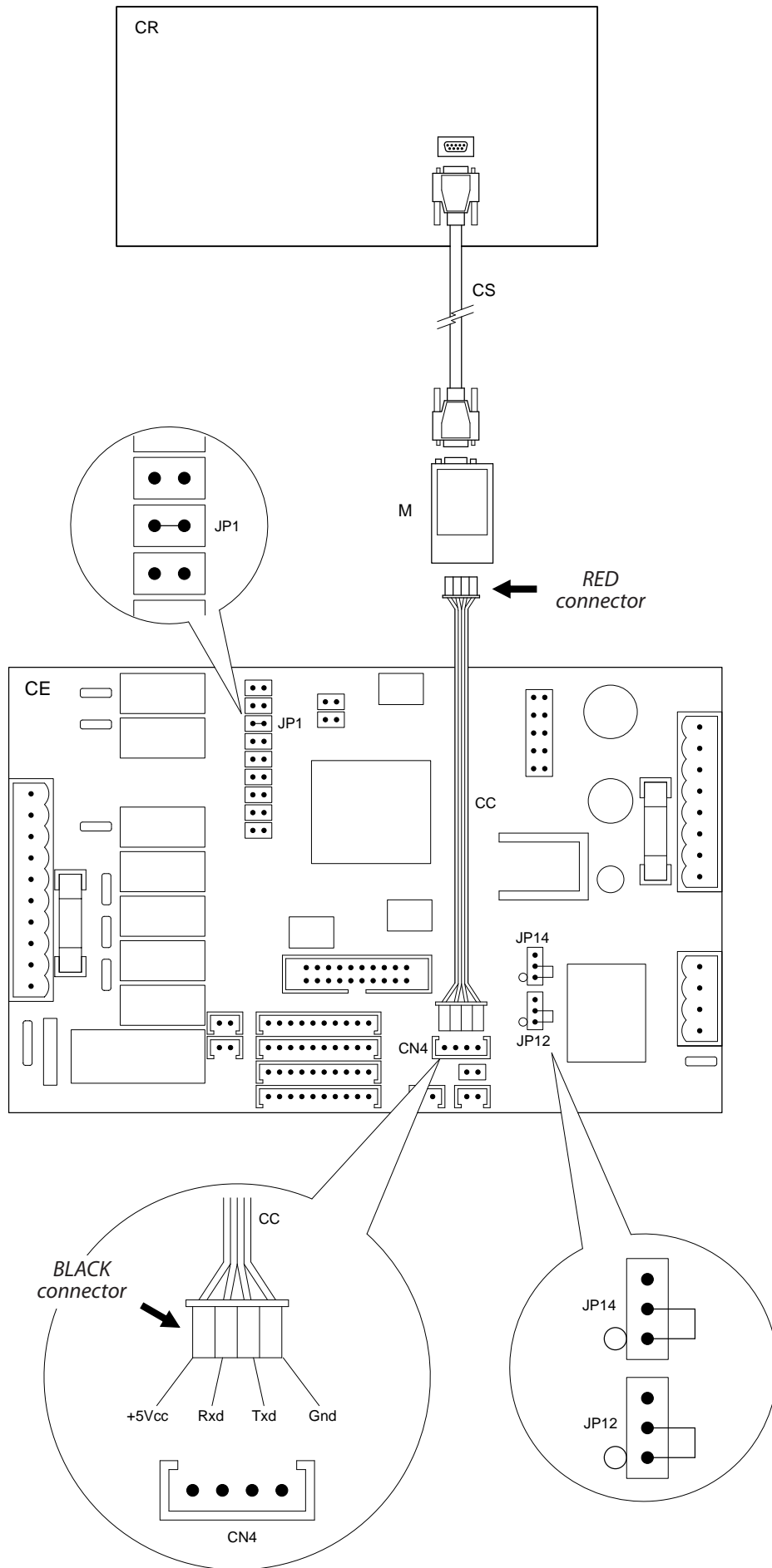
The cash register management software and the standard serial cable CS (maximum length 15 metres) are not the responsibility of the manufacturer.

Response from the till timeout: 1 second

Programming of doses can be performed without having to disconnect the Credit-Debit device.

If the cash register is enabled, programmed doses are counted. To prevent counting, de-activate jumper JP1 prior to programming.

CC	Supplied serial connection cable cod. 22556005
CS	Serial transmission cable not supplied cod. 22556004 (max15 mt)
CN4	Serial transmission connector
CR	Cash register
CE	Electronic control unit: - Plus1 cod. 18090047-48 - Plus2 cod. 18090079-80 - Plus3 cod. 18090051-52
M	Signal converter, cod. 22556003



17.2 Communication protocol

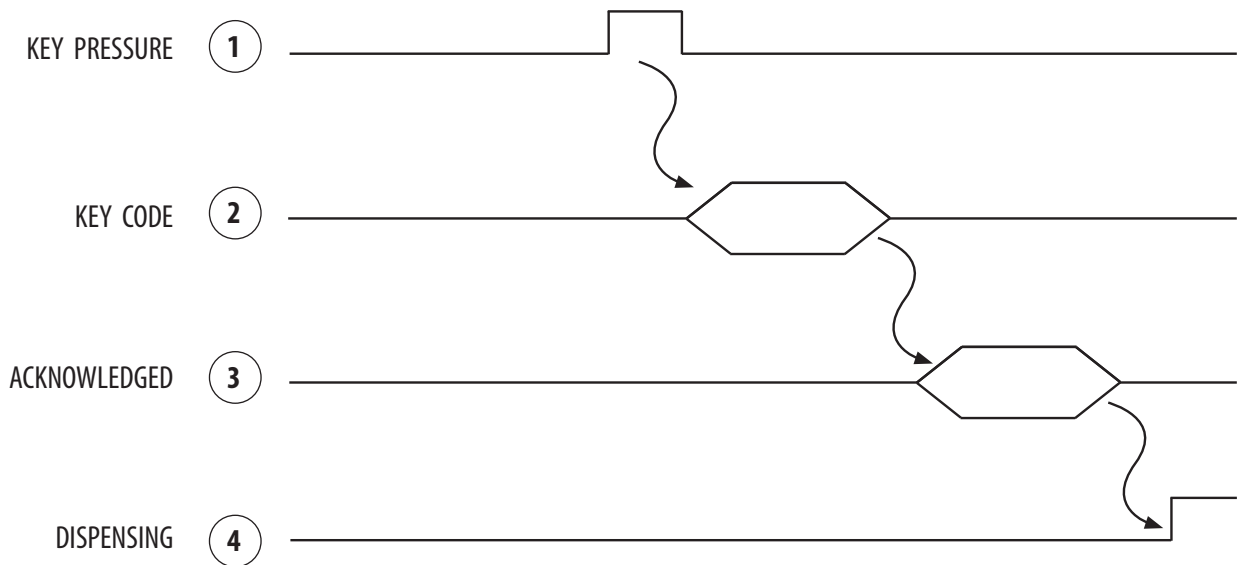
Description of the operating principle with reference to the diagram shown below:

- select the desired dose on the coffee machine;
- the code that corresponds to the selection is sent to the cash register (see codes table);
- the cash register replies ACK=1H thus enabling dispensing;
- the coffee machine delivers the beverage;
- the cash register records the delivered beverage

If the cash register does not identify the code, there is no enabling and the dispensing is not made, the cash register sends the NACK=15H code



Baud rate: 1200, 8 bit + 1 bit Stop. Parity E (even)



17.3 Beverages selection codes table

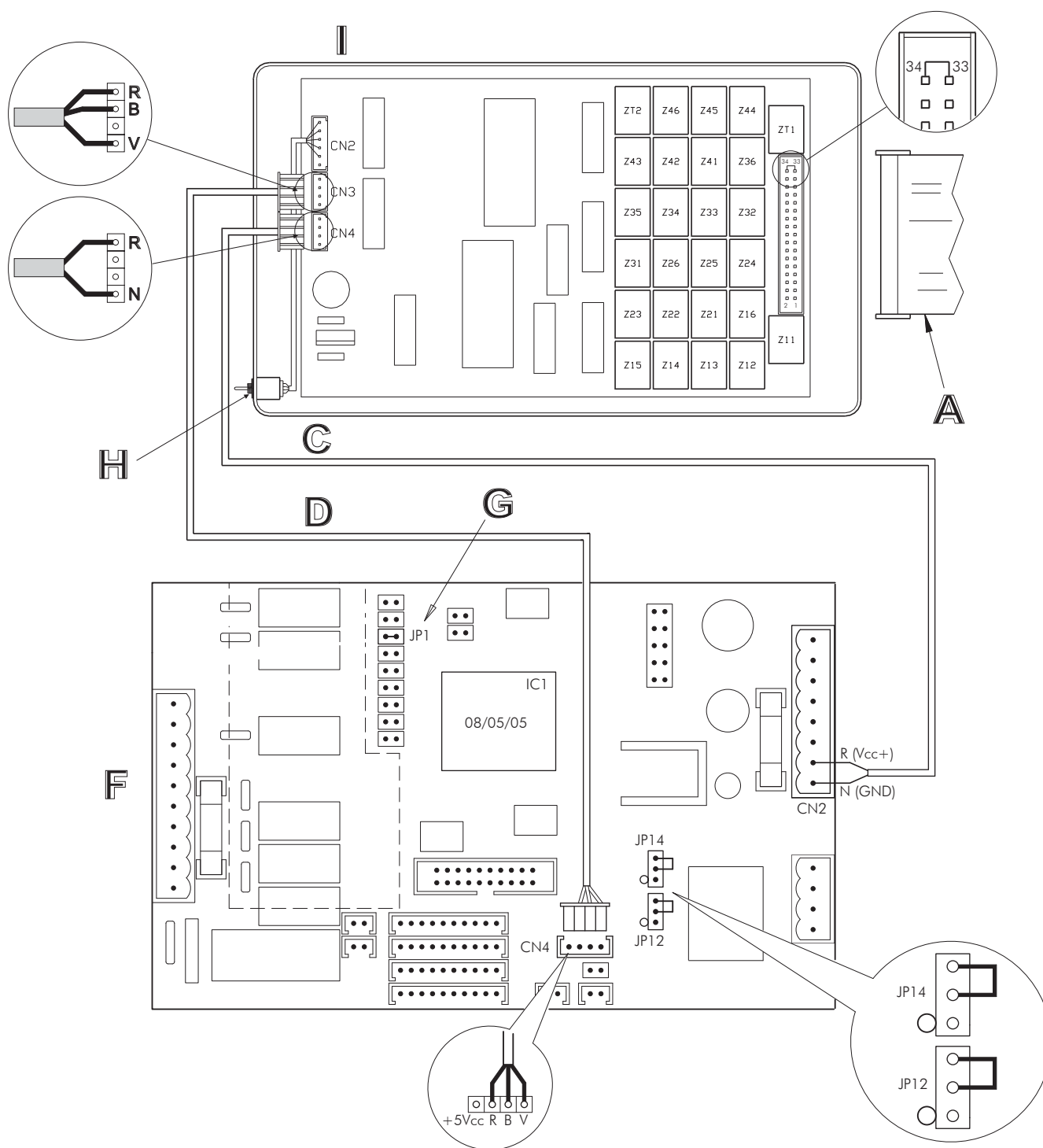
DESCRIPTION	SIGNAL	RELAY	I/O CONNECTOR REF.
1 Espresso GR1	011 h	1	CN7-1
1 Medium GR1	012 h	2	CN7-2
1 Large GR1	013 h	3	CN7-3
2 Espressos GR1	014 h	4	CN7-4
2 Medium GR1	015 h	5	CN7-5
2 Large GR1	016 h	6	CN7-6
1 Espresso GR2	021 h	7	CN7-7
1 Medium GR2	022 h	8	CN7-8
1 Large GR2	023 h	9	CN7-9
2 Espressos GR2	024 h	10	CN7-10
2 Medium GR2	025 h	11	CN7-11
2 Large GR2	026 h	12	CN7-12
1 Espresso GR3	031 h	13	CN7-13
1 Medium GR3	032 h	14	CN7-14
1 Large GR3	033 h	15	CN7-15
2 Espressos GR3	034 h	16	CN7-16
2 Medium GR3	035 h	17	CN7-17
2 Large GR3	036 h	18	CN7-18
1 Espresso GR4 / Cappuccino	041 h	19	CN7-19
1 Medium GR4 / Latte	042 h	20	CN7-20
1 Large GR4 / Foamed milk	043 h	21	CN7-21
2 Espressos GR4 / Warm milk	044 h	22	CN7-22
2 Medium GR4 / Milk with shot of coffee	045 h	23	CN7-23
2 Large GR4	046 h	24	CN7-24
Tea 1	051 h	25	CN7-25
Tea 2	052 h	26	CN7-26
			CN7-33 I/O enabling
			CN7-35 I/O enabling
			CN7-37 com. relay
			CN7-38 com. relay

18. DEBIT - CREDIT system with connection to the INTERFACE

18.1 Beverages selection codes table

PIN	RELAY	Group	DOSE KEY
1	Z11	1	1
2	Z12	1	2
3	Z13	1	3
4	Z14	1	4
5	Z15	1	5
6	Z16	1	6
7	Z21	2	1
8	Z22	2	2
9	Z23	2	3
10	Z24	2	4
11	Z25	2	5
12	Z26	2	6
13	Z31	3	1
14	Z32	3	2
15	Z33	3	3
16	Z34	3	4
17	Z35	3	5
18	Z36	3	6
19	Z41	4	1
20	Z42	4	2
21	Z43	4	3
22	Z44	4	4
23	Z45	4	5
24	Z46	4	6
25	ZT1		TEA
26	ZT2		
27			
28			
29	HTW common signals		
30	HTW common signals		
31			
32			
33			ABHART*
34			GND*

18.2 PLUS 1-2 (GIEMME type) system



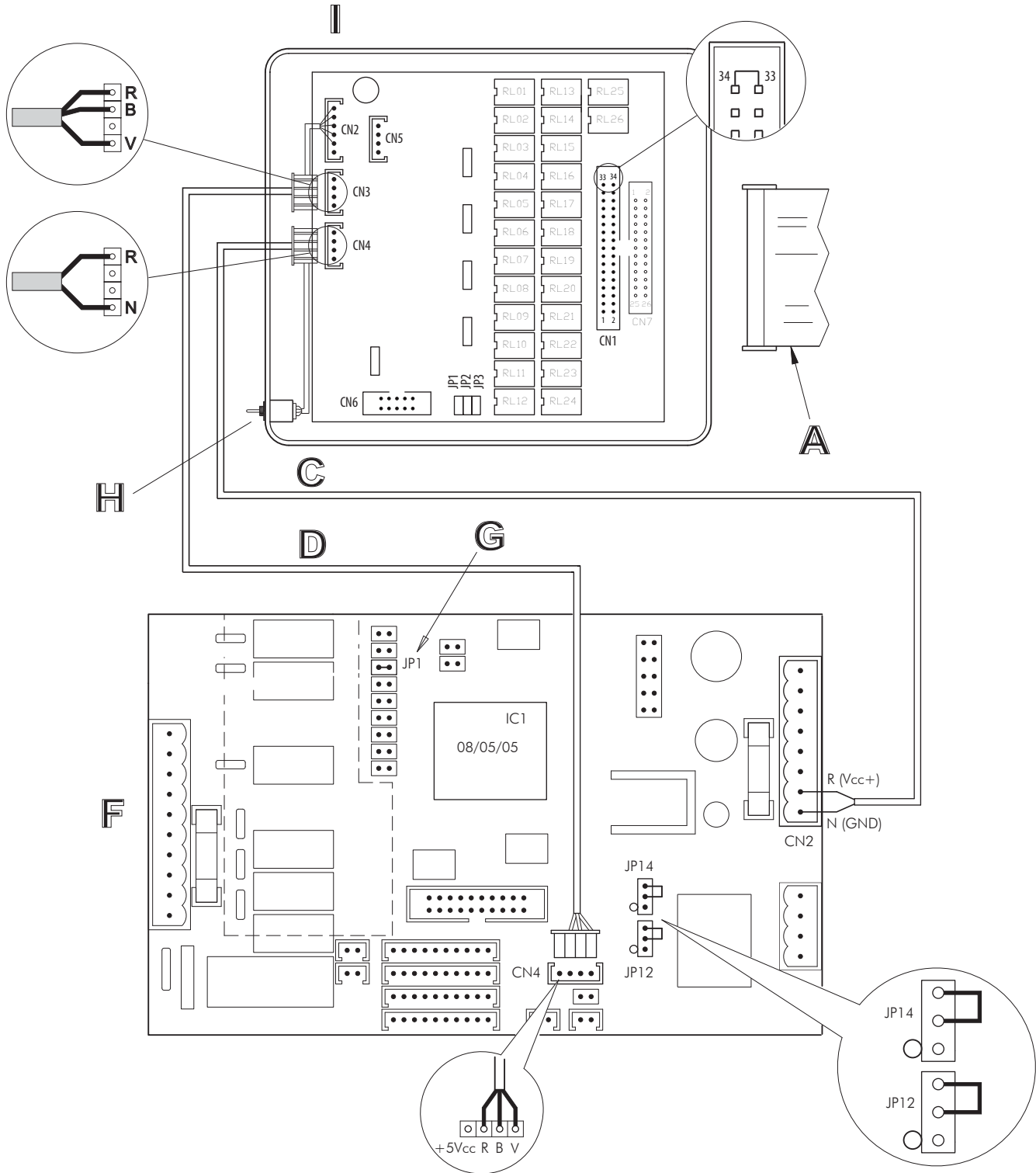
Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26015 26-relay interface
- Code 22550 Hartwall cable
- Code 22551 Power cable
- Code 22555 4-pole serial transmission cable



Interface Kit Cod.: 83260002R

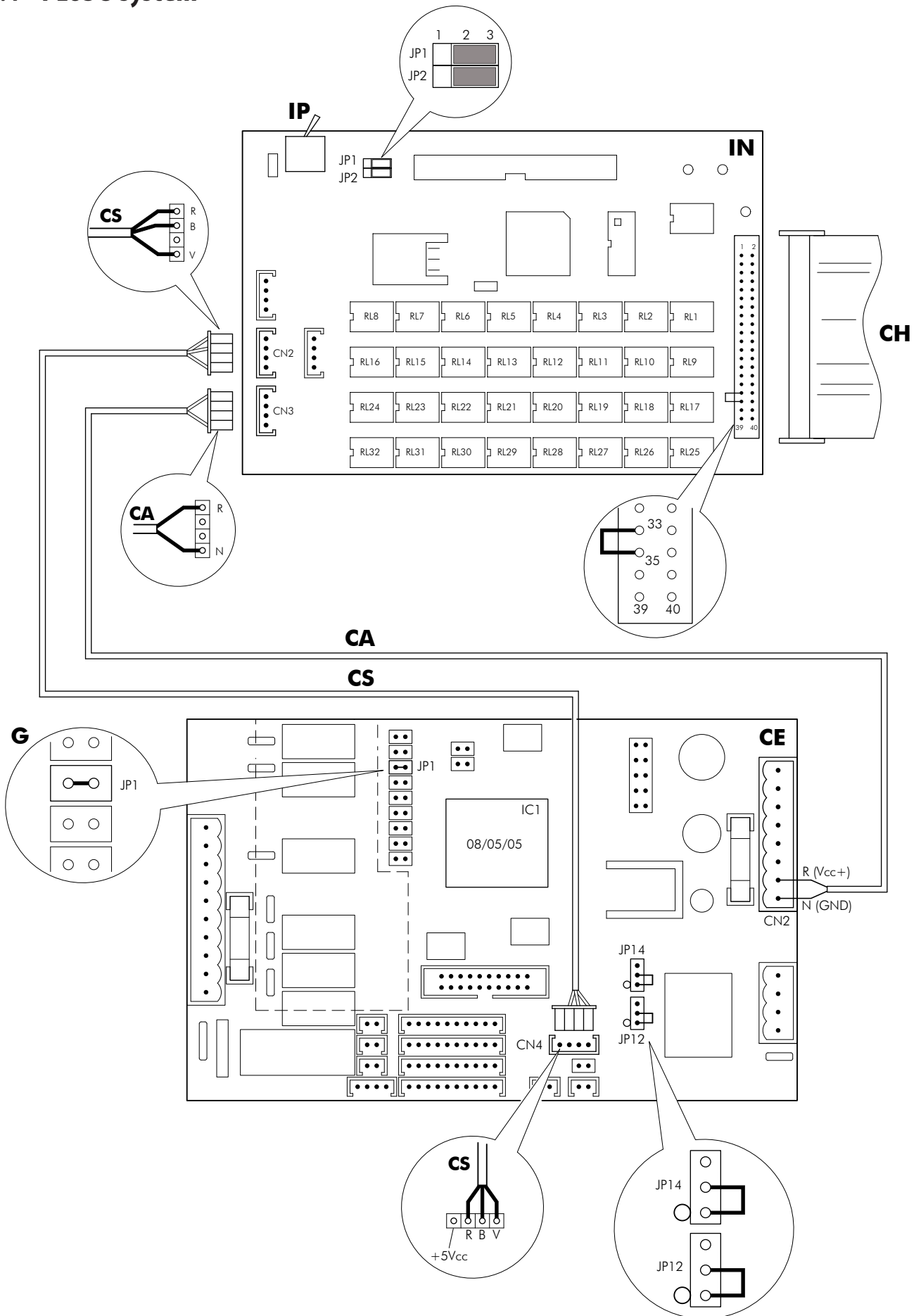
18.3 PLUS 1-2 (GICAR type) system



REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
F	Dosing
G	Short circuit JP1

REF.	DESCRIPTION
H	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green
33-34	Activation

18.4 PLUS 3 system



Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26016 32-relay interface
- Code 22554004 Hartwall cable
- Code 22551 Power cable
- Code 22555 4-pole serial transmission cable



Interface Kit Cod.: 83260033R

REF.	DESCRIPTION
IN	Interface 32 relay cod. 26016
CE	PLUS 3 electronic central unit cod. 18090051-18090052
CA	Power cable 8.9.28.12 code 22551
CH	Hartwall cable 8.9.28.51 code 22554004
CS	Serial transmission cable code 22555
IC1	Microprocessor dated 08/04/05 or later
G	Short circuit JP1
IP	Program. switch: Never place the lever in the PROG position
B	White
N	Black
R	Red
V	Green
33 - 35	Activation



If the microprocessor is dated prior to 08/05/05, replace it with one dated 08/05/05 or later.

DOSE	RELAY	REF. I/O CONNECTOR
1 Espresso GR1	1	CN7-1
1 Medium GR1	2	CN7-2
1 Large GR1	3	CN7-3
2 Espressos GR1	4	CN7-4
2 Medium GR1	5	CN7-5
2 Large GR1	6	CN7-6
1 Espresso GR2	7	CN7-7
1 Medium GR2	8	CN7-8
1 Large GR2	9	CN7-9
2 Espressos GR2	10	CN7-10
2 Medium GR2	11	CN7-11
2 Large GR2	12	CN7-12
1 Espresso GR3	13	CN7-13
1 Medium GR3	14	CN7-14
1 Large GR3	15	CN7-15
2 Espressos GR3	16	CN7-16
2 Medium GR3	17	CN7-17
2 Large GR3	18	CN7-18
1 Espresso GR4 / Cappuccino	19	CN7-19
1 Medium GR4 / Latte	20	CN7-20
1 Large GR4 / Foamed milk	21	CN7-21
2 Espressos GR4 / Warm milk	22	CN7-22
2 Medium GR4 / Milk with shot of coffee	23	CN7-23
2 Large GR4	24	CN7-24
Tea 1	25	CN7-25
Tea 2	26	CN7-26
		CN7-33 I/O enabling
		CN7-35 I/O enabling
		CN7-37 com. relay
		CN7-38 com. relay
		CN7-39 com. relay
		CN7-40 com. relay

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