

**AL
AEP
SAE
DISPLAY**

ESPRESSO COFFEE MACHINE
Use and Maintenance Manual. TECHNICIANS' instructions.

EN



IMPORTANT: Read carefully before use. Store for future reference.

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I. SAFETY PRECAUTIONS

I.I. LEVEL OF TRAINING AND KNOWLEDGE REQUIRED OF THE TECHNICIAN

The Technician is a specialised person that has been specially trained and authorised to carry out the following operations in accordance with current regulations: transport and handling, storage, installation, commissioning, maintenance, decommissioning, dismantling and disposal of the machine.

The Technician must be properly trained and informed regarding any residual risks present during these operations and while the machine is operating.

The Technician must be able to apply all the good practices in compliance with food hygiene principles.



Any unauthorised tampering with any parts of the machine renders the guarantee null and void and relieves the manufacturer of any liability should the machine malfunction or any user accidents occur.

I.II. SAFETY PRECAUTIONS

Even though the machine is provided with all safety devices required to eliminate possible risks for the Technician, there are still certain residual risks.

These so-called residual risks are related to machine parts that may pose a risk to the Technician, if used improperly, evaluated or deactivated incorrectly, because the prescriptions contained in this Manual were circumvented.

The machine is also equipped with appropriate warnings placed on residual risk areas, which must be scrupulously observed.

Attention must be paid to the residual risks that are present during the operations described in the following paragraphs as they cannot be eliminated:

Compliance with the installation and machine's safety standards is dependent on the use, installation, maintenance and correct operation of the machine. These factors are the responsibility of the purchaser, Technician and Technician's employer.

The Technician's employer is responsible for hiring and training personnel to correctly install, run and perform maintenance work on the machine and its protection systems.

I.III. TRANSPORT AND HANDLING



Hand crushing hazard

Handling operations must always and exclusively be performed by the Technician and in compliance with the current health and safety regulations.

Before starting the transport and/or handling manoeuvres, check the route, dimensions needed, safety distances, places suitable for placing the load down, and the appropriate equipment for the operation.

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

In view of the substantial weight of the equipment, exercise great caution during the handling operations.

The manufacturer is not responsible for any injury or damage caused by clothing, lifting equipment and personal equipment which was not suitable for the type of intervention that the operator had to carry out.

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

I.IV.INSTALLATION



Electrical hazard



High temperature hazard



Risk of explosion



It is prohibited to perform maintenance on moving components

Installation operations must always and exclusively be performed by the Technician and in compliance with the current health and safety regulations.

The appliance's water supply must provide water which is suitable for human consumption, and must conform with the regulations in force in the place of installation.

The Technician must carry out the hydraulic connections in accordance with the hygiene and hydraulic safety standards regarding environmental protection which are in force in the place of installation.

To ensure electrical safety, the appliance must be connected to an effective earthing system, and the system in which it is installed must be equipped with a suitable differential circuit breaker, in compliance with the safety laws and standards.

The effectiveness of the earthing system and functionality of the differential circuit breaker - both of which are fundamental for guaranteeing the appliance's electrical safety - are the responsibility of the person in charge of the electrical system on which the equipment is installed.

The manufacturer cannot be considered responsible for any damage caused by an inadequate electric system.

Make sure that the electric mains power is enough to supply the energy needed for the machine to correctly operate.

The appliance installation operations must be carried out with the electrical mains switched off. To make the electrical system

safe and be able to carry out operations when the machine is not powered, the Technician must apply the rules prescribed by current technical standards (disconnect the power supply, avoid reclosures, check that there is no voltage, etc.).

I.V. MAINTENANCE AND CLEANING



Electrical hazard



High temperature hazard



Risk of explosion



The only personnel authorised to access the service area are those who are knowledgeable about and have practical experience using the appliance, particularly in regards to safety and hygiene.

Maintenance and cleaning operations must always and exclusively be performed by the Technician and in compliance with the current health and safety regulations.

The maintenance and cleaning operations must comply with the safety regulations:

- Do not carry out maintenance work when the machine in operation.
- Do not immerse the machine in water.
- Do not pour liquids onto the machine or use water jets when cleaning.
- Do not allow maintenance and cleaning operations to be carried out by children or incompetent people.
- Do not perform maintenance and cleaning operations other than those described in this manual.

When cleaning, pay attention to the parts of the machine that can become hot:

- Avoid contact with the dispensing group, water spouts and steam nozzles.

- Do not place your hands or other body parts near the steam, hot water or milk dispensing nozzle tips.

If gas is used (where applicable), take special care with the following:

- When indoors, always provide air vents.
- Check for any gas leaks.
- Do not under any circumstances attempt to light the gas without first installing the proper injector.
- Do not start up the gas burners when the heating unit is empty.

Only perform the maintenance and cleaning operations indicated in this manual.

If the problem cannot be resolved, switch off the machine and contact the Manufacturer.

All maintenance operations must be carried out when the power supply has been turned off, the water mains has been closed off, and the machine has completely cooled down.

After maintenance and/or repair work, the components that are used must ensure that the hygiene and safety requirements initially provided for the appliance are still met. These are met by only using original spare parts. When components which come into contact with water or food are repaired or replaced, a washing procedure has to be carried out, as if it were the first installation.



The Technician must inform the User about the methods of periodic testing of pressure equipment and safety devices in accordance with the legislation in force in the country of installation.

I.VI.EMERGENCY SITUATIONS

Should an emergency situation occur as a result of a machine malfunction, adopt the measures provided for in the emergency plan posted in the premises and in any case, proceed to immediately carry out the actions based on the type of problem.

SHORT CIRCUIT FIRE

In the event of a fire caused by the machine's electrical system malfunctioning, adopt the following behaviours:

- Disconnect the machine from the power mains via the main switch.
- Call the fire and rescue service.
- Get everyone a safe distance away from the premises.
- Extinguish the flames using a CO₂ fire extinguisher.

GAS LEAK

In the event of a fire caused by the machine's system malfunctioning, adopt the following behaviours:

- Shut off the gas supply by closing the valve upstream of the machine.
- Get everyone a safe distance away from the premises.
- Ventilate the premises.
- Call the technician that installed the machine.
- If necessary, call the fire and rescue service.

GAS LEAK FIRE

In the event of a fire caused by the machine's gas system malfunctioning, adopt the following behaviours:

- Shut off the gas supply by closing the valve upstream of the machine.
- Disconnect the machine from the power mains via the main switch.
- Call the fire and rescue service.
- Get everyone a safe distance away from the premises.
- Extinguish the flames using a CO₂ fire extinguisher.

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1. INTRODUCTION

Read this manual carefully. It provides important safety information to the Technician regarding 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 appliance cannot be held responsible for any damage caused due to the non-observance of the requirements listed in this manual.



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

This document assumes that the machine is installed in a location where the current work safety and hygiene standards are observed.

The instructions, drawings and documentation contained in this Manual are technical and confidential. They are the sole property of the Manufacturer, and may not be fully or partially reproduced in any way.

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 was released to the market.

We encourage the Technicians to make any proposals in regards to improving the product or its Manual.

1.1 Guidelines for reading the Manual

This Manual is divided into separate chapters. The chapter order is linked 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 consists of cover, index and series of chapters. Each chapter is sequentially numbered. The page number is shown in the footer.

The machine identification data is displayed on the machine's nameplate and the EU declaration of Conformity, whilst the date and revision of the Instruction Manual is provided on the last page.

Abbreviations

Sec.	=	Section
Chap.	=	Chapter
Para.	=	Paragraph
P.	=	Page
Fig.	=	Figure
Tab.	=	Table

Units of measurement

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

1.2 Storing the Manual

The Instruction Manual must be stored carefully. The manual should be stored, handled with care with clean hands and not placed on dirty surfaces. The Manual must be stored in an environment protected from moisture and heat.

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

On the Technician's request, the manufacturer can provide additional copies of the machine's Instruction Manual.

1.3 Method for updating the Instruction Manual

The Manufacturer reserves the right to modify and make improvements to the machine without providing notice or updating the Manual that has already been received.



Should the Manual become illegible or otherwise hard to read, the Technicians must request a new copy from the Manufacturer before carrying out any operations 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. They may not be reproduced in any way, either in full, or in part without prior authorisation. The Technician is responsible for complying with the instructions contained in this Manual.

Should any incident occur as a result of these recommendations being used incorrectly, the Manufacturer declines any liability.

This manual is also available on the manufacturer's website shown on the cover of the manual.

1.4 Recipients

This Manual is intended for the Technician who is responsible for carrying out the following operations on the machine:

- Transport and handling;
- Storage;
- Installation;
- Commissioning;
- Maintenance;
- Cleaning;
- Spare part replacement;
- Emergency operations and faults;
- Decommissioning;
- Disassembly;
- Disposal (refer to the retailer if not directly responsible).

RECIPIENT QUALIFICATIONS

The machine is intended for a professional non-generalised use, therefore the Technician must:

- Have attended the training courses organised by the Manufacturer relating to the type of machine;
- be aged 18 and over;
- be physically and mentally fit to use the machine;
- be able to understand and interpret the Instruction Manual and the safety requirements;
- know the safety procedures and how they are implemented;
- be able to use the machine;
- have understood the procedures of use as defined by the machine's manufacturer.

1.5 Glossary and Pictograms

This paragraph lists uncommon terms or terms whose meanings are different than those most commonly used.

Abbreviations are explained below, as well as the meaning of pictograms describing the operator's qualification and the machine status; they are used to quickly and uniquely provide the information needed to correctly and safely use the machine.

1.5.1 Glossary

User

The person in charge of operating the machine and performing the routine cleaning operations indicated in this manual.

Technician

A specialised person who has been specially trained and authorised to carry out the following operations in accordance with current regulations: transport and handling, storage, installation, commissioning, maintenance, decommissioning, dismantling and disposal of the machine.

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 protective equipment (PPE)

Clothing or equipment worn by someone to protect their 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 machine's safety devices.

Residual risk

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

Safety component:

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

1.5.2 Pictograms

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

- A safety risk for those operating the machine.
- User injury, including serious injury (in some cases even death).
- The guarantee being rendered null and void.
- The Manufacturer waiving liability.



GENERAL DANGER symbol used when there is a risk of permanent serious injury that would require hospitalisation, or in extreme cases, even cause death.



ELECTRICAL HAZARD symbol used when there is a risk of permanent serious injury that would require hospitalisation, or in extreme cases, even cause death.



HIGH TEMPERATURE HAZARD symbol used when there is a risk of permanent serious injury that would require hospitalisation, or in extreme cases, even cause death.



HAND CRUSHING RISK symbol used when there is a risk of permanent serious injury that would require hospitalisation, or in extreme cases, even cause death.



EXPLOSION RISK symbol used when there is a risk of permanent serious injury that would require hospitalisation, or in extreme cases, even cause death.



CAUTION symbol used when there is a risk of minor injury that could require medical attention.



WARNING symbol used when there is a risk of minor injury that could be treated with first-aid or similar measures.



NOTE symbol used to provide important information about the topic.



It is prohibited to perform maintenance on moving components as there is a risk of permanent serious injury that could require hospitalisation.



Mandatory symbol indicating that safety gloves must be worn; used when there is a risk of permanent serious injury that would require hospitalisation.



Mandatory symbol indicating that eye protection must be used when there is a risk of permanent serious injury that would require hospitalisation.



Mandatory symbol indicating that safety shoes must be used when there is a risk of permanent serious injury that would require hospitalisation.



Mandatory symbol indicating that the documentation must be read; used to make the Technician aware of the importance of this action for their safety.

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1.6 Guarantee

All of the machine's components are covered by a 12-month guarantee, except for electrical and electronic components and parts prone to wear and tear.

If any work is carried out on the machine electronics when the machine is still live, any guarantee will automatically be invalidated.

2. MACHINE IDENTIFICATION

2.1 Make and model designation

The machine and model ID information is found on the machine's NAMEPLATE and in the provided EU DECLARATION OF CONFORMITY.

2.2 General description

The machine described in this Manual consists of mechanical, electrical, and electronic components which, when used together, produce milk, coffee and water-based beverages. This product is manufactured in compliance with the EU Directives, Regulations and Standards indicated in the EU DECLARATION OF CONFORMITY provided with the machine.

2.3 The manufacturer's customer service

2.4 Intended use

The espresso coffee machine has been designed to professionally prepare hot beverages such as tea, cappuccinos and weak, strong and espresso coffee, etc. The appliance is not intended for domestic use, it is intended for professional purposes only.

The machine can be used under all the conditions set forth, contained or described in this document; any other conditions must be considered dangerous. The machine must be installed in a place where its access is restricted to qualified personnel only who have received suitable training (coffee shops, restaurants, etc.).

Permitted uses

All uses compatible with the technical features, operations and applications described in this document which do not endanger the safety of users or can cause damage to the machine or its surrounding environment.



All uses not specifically mentioned in this Manual are prohibited and must be expressly authorised by the Manufacturer.

Intended uses

The machine has been 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 be dangerous for the operator and/or those in close proximity to the Machine, is considered incorrect or improper.

Contraindications of use

The machine must not be used:

- for uses other than those indicated in this paragraph or for uses that differ from or are not mentioned in this Manual.
- with materials other than those listed in this Manual.
- with safety devices that have been disabled or are not working.

Incorrect use of the machine

The type of application and performance that this machine has been designed for, requires a number of operations and procedures that cannot be changed, unless previously agreed with the Manufacturer. All permitted behaviours are indicated in this document; any operation not listed and described herein is to be considered improper and therefore, hazardous.

Improper use

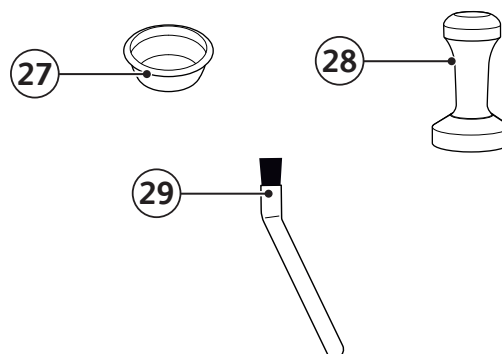
The only permitted uses are described in the Manual; any other use is considered improper and therefore, hazardous.

General safety features

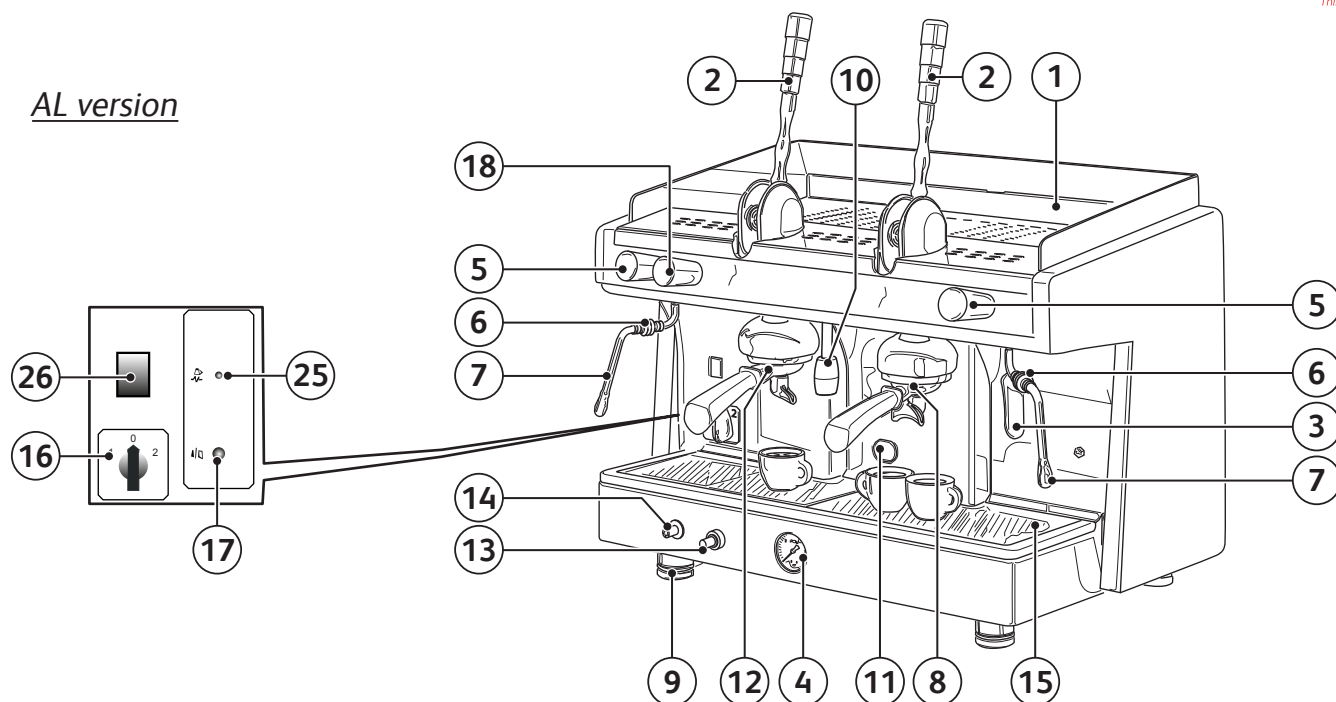
The Technician must be aware of accident risks, safety devices and the general safety rules set forth in EU directives and by the legislation of the country where the machine is installed. The Technician must know how all the machine's devices work. They must also have fully read and understood this Manual. Maintenance work must be performed by the Technician after the machine has been properly prepared. The tampering or unauthorised replacement of one or more machine components, the use of accessories which modify its use and the use of materials other than those recommended in this Manual, can cause accidents.

2.5 Machine diagram

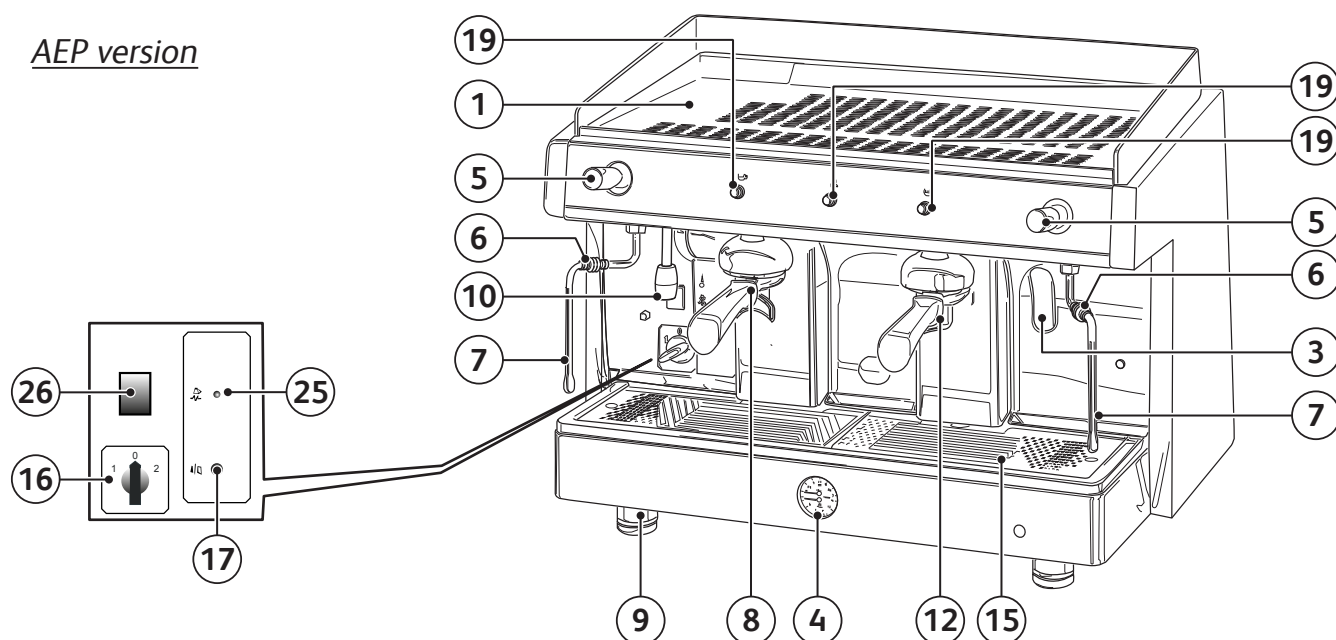
1. Cup warmer shelf
2. Group lever
3. Heating unit water level window (in some versions, the level window is replaced by a green indicator light)
4. Pressure gauge
5. Steam knob
6. Scald protection
7. Steam nozzle
8. 2-cup filter holder
9. Adjustable foot
10. Hot water nozzle
11. Gas burner inspection window (optional)
12. 1-cup filter holder
13. Gas safety (optional)
14. Gas ignition button (optional)
15. Cup holder grille
16. Power switch
17. Machine on indicator light
18. Hot water knob
19. Manual dispensing pushbutton panel (AEP)
20. Pushbutton panel (SAE)
21. Display
22. Manual and water dispensing buttons (DISPLAY)
23. Automatic steam wand pushbutton panel (optional)
24. Automatic team wand nozzle (optional)
25. Machine/cup warmer indicator lights
26. Cup warmer switch
27. Blind filter
28. Presser
29. Cleaning brush



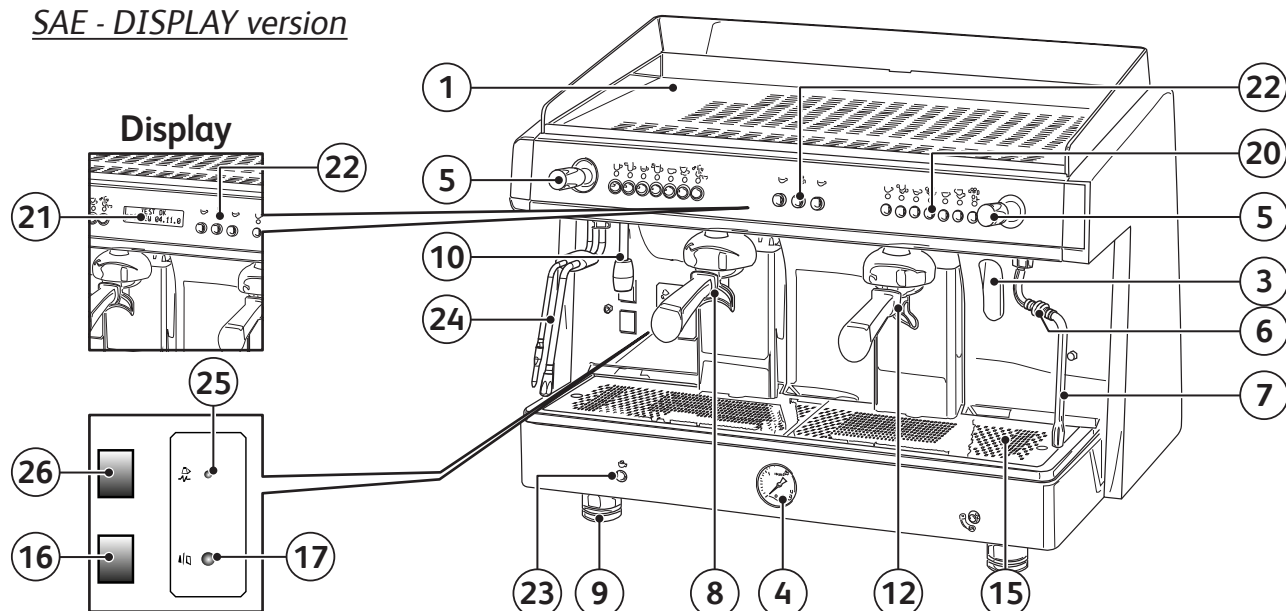
AL version



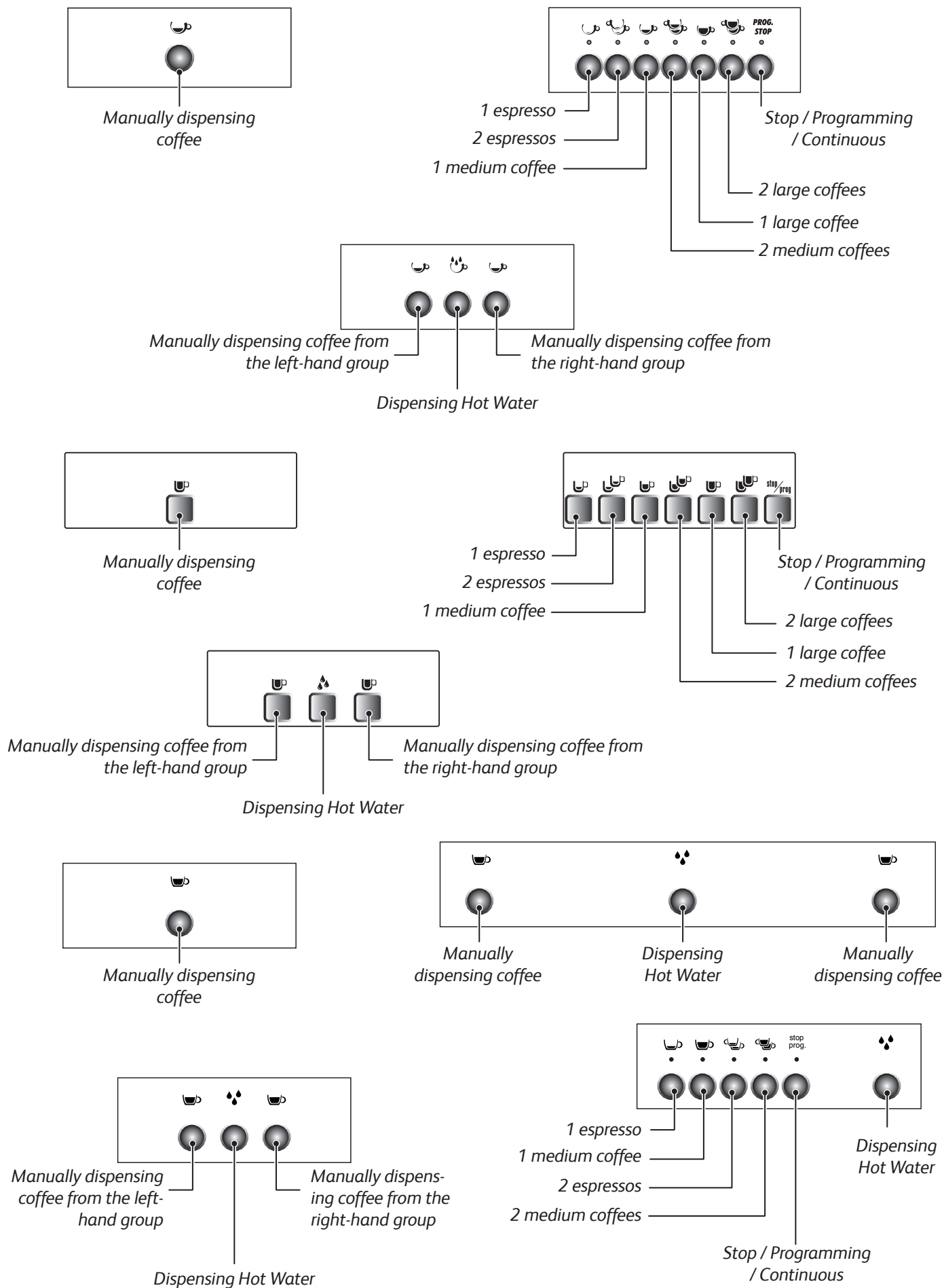
AEP version



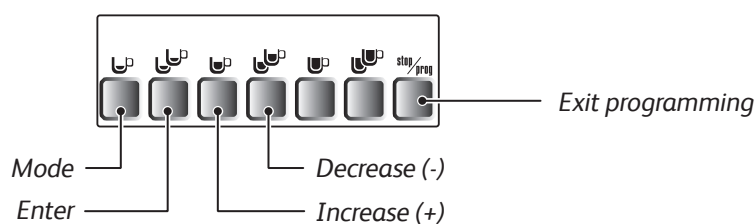
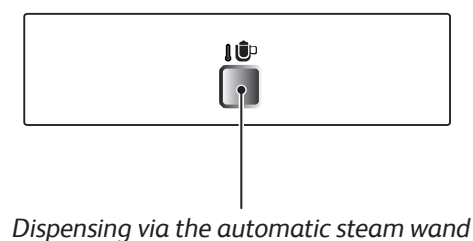
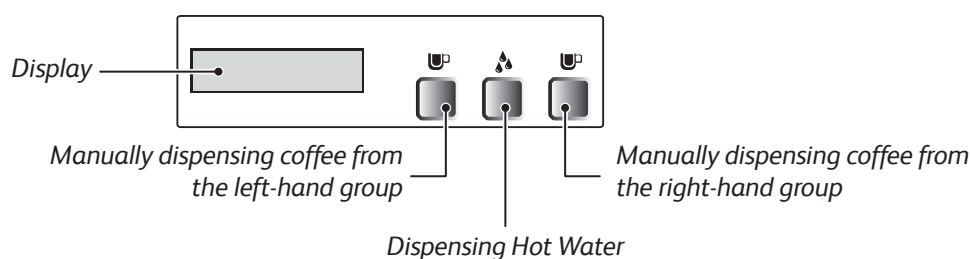
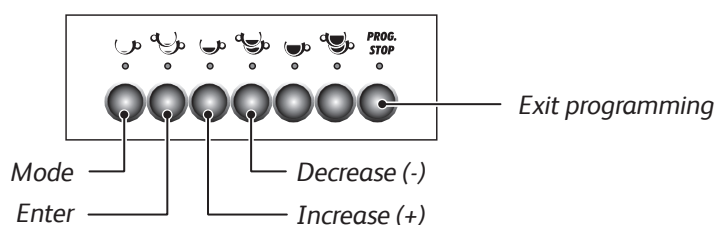
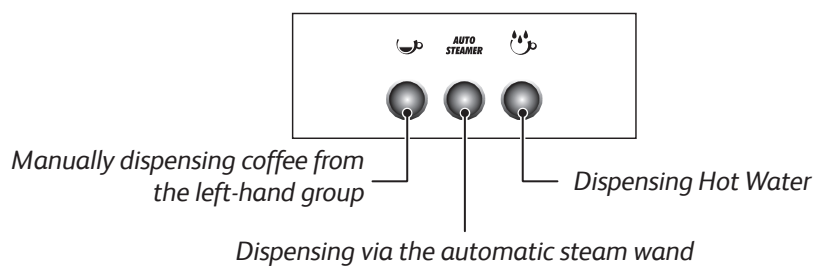
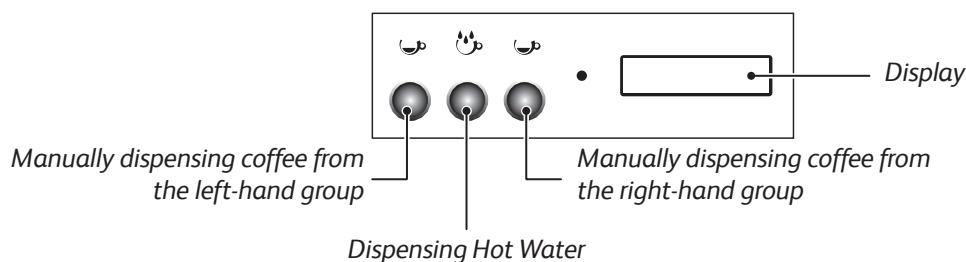
SAE - DISPLAY version



2.6 Pushbutton panels for the AEP & SAE versions

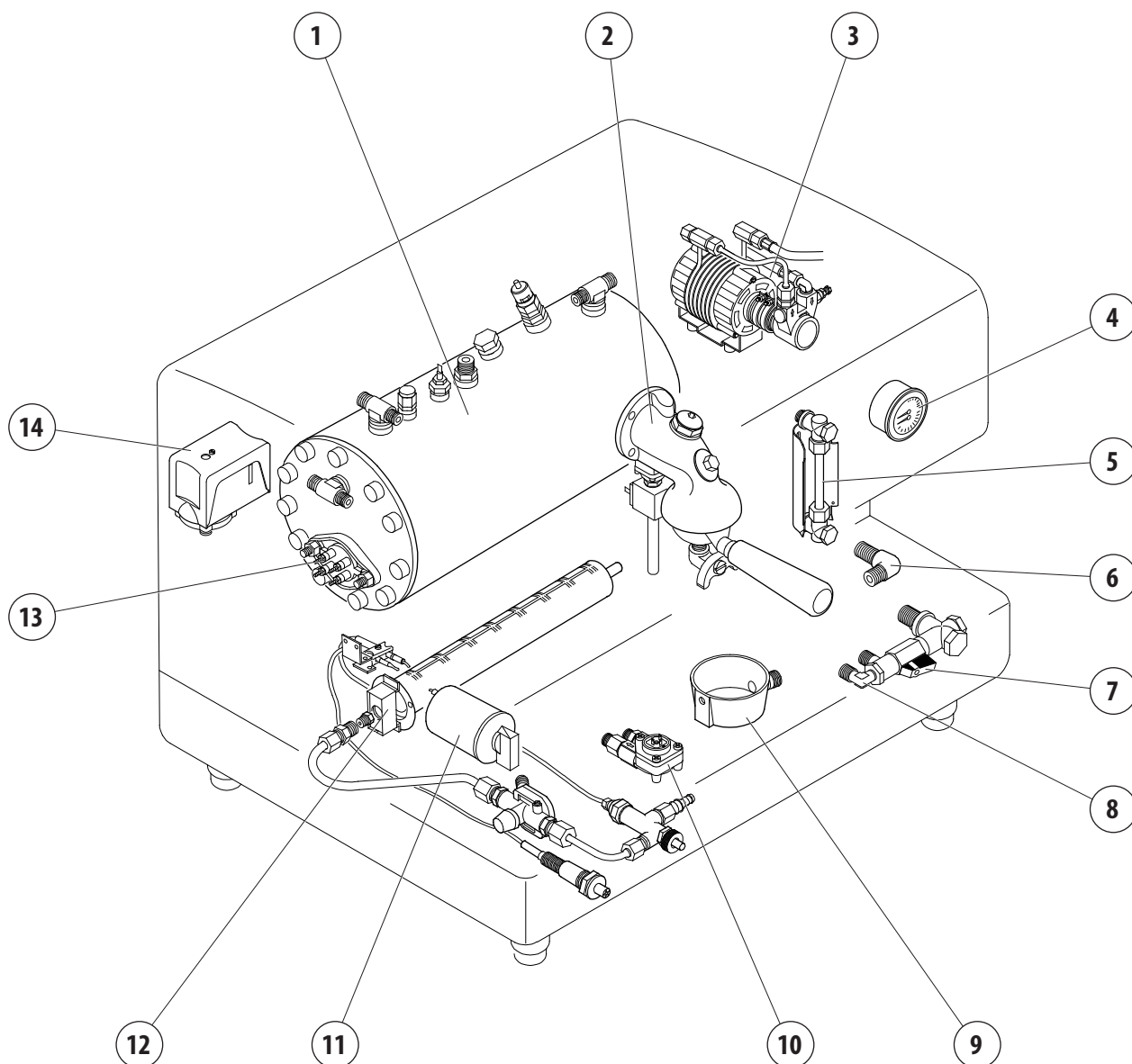


2.7 Pushbutton panels for the DISPLAY versions



2.8 Internal components

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



2.9 Data and marking

The machine's general technical data is provided in the following table:

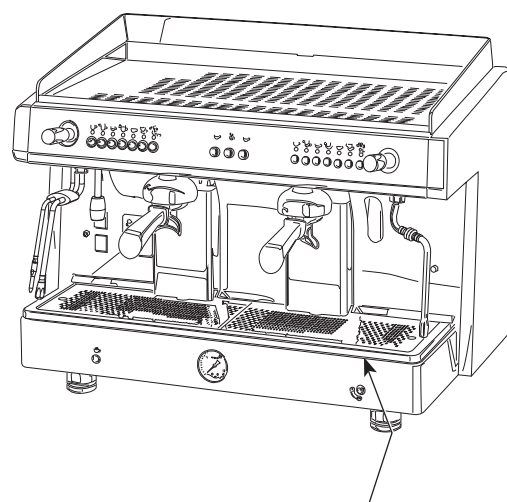
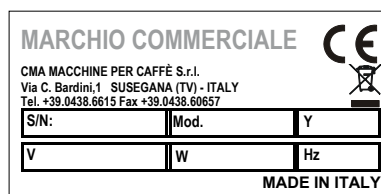
TECHNICAL DATA TABLE		1GR	COMPR.	2GR	3GR	4GR
120 V	Power	2200-2330 W	2600-2930 W	2600-3400 W	---	---
220-240 V		2500-3900 W	2900-3100 W	2900-4800 W	3700-5800 W	5300-6600 W
380-415 V						
Frequency		50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
Heating unit		5,2-6,3 l	7 l	9,0-10,6 l	14,7-17,2 l	20,4-23,8 l
Safety valve calibration	0,19 MPa (1,9 bar) +/- 0,015 MPa					
Heating unit operating pressure	0.08 - 0.14 MPa (0.8 - 1.4 bar)					
Mains water pressure	0.15 - 0.6 MPa max. (1.5 - 6 bar max.)					
Coffee dispensing pressure	0.8 - 0.9 MPa (8 - 9 bar)					
Working environment temperature	5 - 35°C 95° MAX. R.H.					
Sound pressure level	< 70 dB					

In compliance with directive 2006/42/CE, the machine is marked with the CE code with which the manufacturer declares under his responsibility that the machine is safe for persons and things.

Alternative markings can be affixed according to the target markets, provided they comply with current product regulations.

The nameplate which provides the appropriate markings, identification data and specific technical data, is affixed under the drain tray.

An example of a nameplate is provided below.



The nameplate is affixed under the drain tray

When contacting the Manufacturer, always provide the following information:

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

The appliance data can also be found on the label located on the machine's packaging.



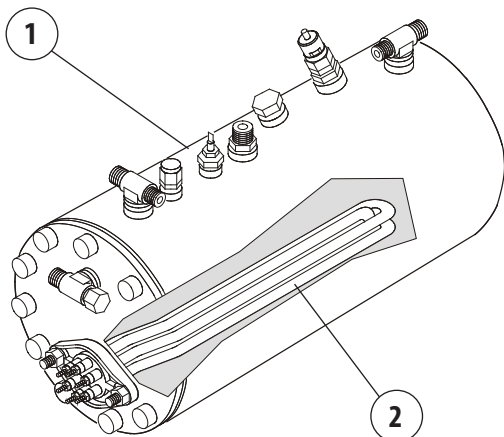
It is forbidden to remove or modify the nameplate. Should it deteriorate or become illegible, contact the Manufacturer.



To correctly connect the machine to the electric mains, refer to Chap. "13. WIRING DIAGRAMS" on page 61.

2.9.1 Heating unit

The heating unit is made of copper sheet metal (1). The heat exchangers are assembled onto this unit and are in turn connected to the dispensing group. The water used for dispensing coffee is taken directly from the heat exchanger. During the dispensing process, cold water is sent inside the exchanger by means of the motor pump. Cold water and the pre-existing hot water are mixed together inside the heat exchanger, in order to obtain the optimal water temperature for coffee infusion.



Electric heating

The heating unit is electrically heated by an electric heating element immersed in the water (2).

Gas heating

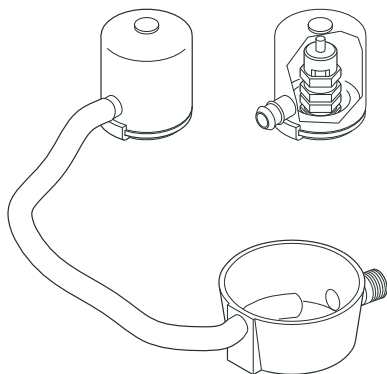
Gas heating is obtained by feeding the burner flame which is located under the heating unit.

Electric + gas heating

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

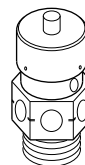
2.9.2 Overflow device

The cover installed on the pressure relief valve makes it possible to collect any water and steam which may leak from the heating unit due to a malfunction and channel it to the drain tray, via a special hose.



2.9.3 Pressure relief safety valve

The pressure relief safety valve has a calibration of 0,19 MPa (1,9 bar) +/- 0,015 MPa in order to ensure that the pressure in the steam heating unit does not exceed 0,21 MPa (2,1 bar). Should a fault occur, the capacity of the valve is such as to be able to eliminate all the excess pressure in the heating unit.



The safety valve should be checked regularly as indicated in Chap. "7. MAINTENANCE AND CLEANING" on page 46.

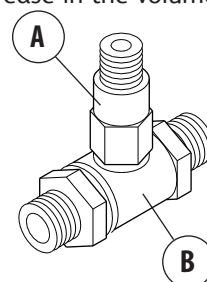


Two safety valves are installed on all machines with 4 groups.

2.9.4 Expansion valve + check valve

This is a valve consisting of an expansion valve and a check valve.

- **Expansion valve (A):**
the cold water sent from the pump to the heat exchangers is heated. This heating causes an increase in the volume of water. To limit pressure increases in the hydraulic circuit, the valve limits the maximum internal pressure of the circuit to 1.2 MPa (12 bar).
- **Check valve (B):**
its function is to prevent the water from back-flowing into the hydraulic circuit exchangers.



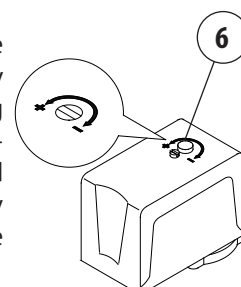
2.9.5 Negative pressure valve

The purpose of the negative pressure valve is to prevent liquids from back-flowing through the steam nozzle when they are being heated. Furthermore, the excess air inside the heating unit is removed during the machine's heating phase.



2.9.6 Pressure switch

The pressure switch makes it possible to control the heating unit pressure by activating or bypassing the heating element in the heating unit. Any pressure switch calibration can be carried out with the machine in operation by turning the screw (6) located on the body of the component.



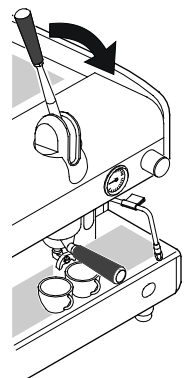
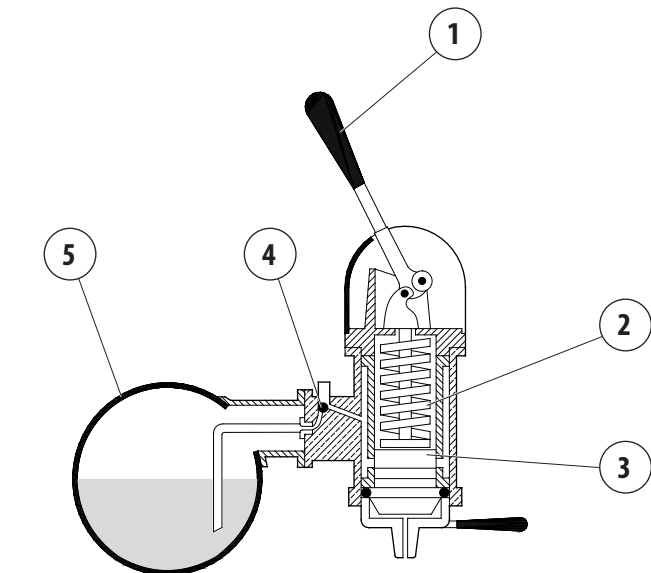
2.9.7 LEVER group

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

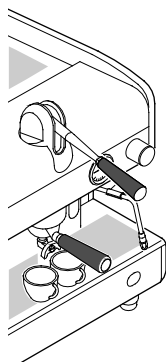
When the lever (1) is lowered, the spring (2) inside the group is compressed: the piston (3) raises, allowing the water to enter the pre-infusion jacket.

When the lever is released, the piston compresses the water at 8-10 bar, allowing the espresso coffee to be dispensed.

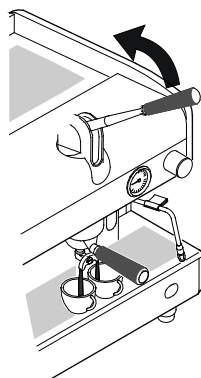
The check ball valve (4) prevents the water from flowing back into the heating unit (5).



PHASE 1
Lowering the lever



PHASE 2
Pre-infusion for 3-5 seconds



PHASE 3
The lever releases and coffee is dispensed.

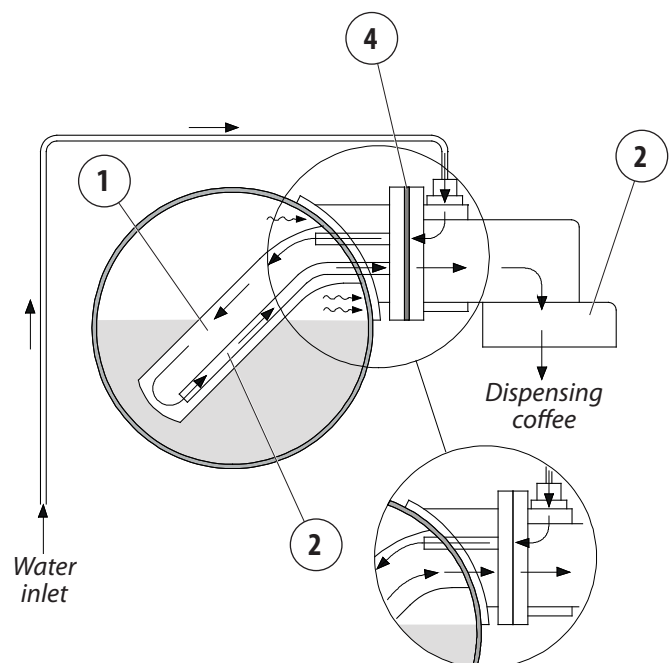
2.9.8 Group with an EXTRACTABLE exchanger

The dispensing group heating is provided by direct contact with the heating unit. The water used to dispense coffee is taken from a so-called "extractable" exchanger which is immersed in the heating unit's water:

- When the solenoid valve and pump activate, this allows cold water to enter into the exchanger (1).
- The heating unit water is carried from the exchanger (1) to the group (2) for dispensing.
- The pump allows the water flow pressure to increase to 0.8-0.9 MPa (8-9 bar).

The version of the extractable exchanger for the Italian market does not include the suction hose (3) and seal (4).

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

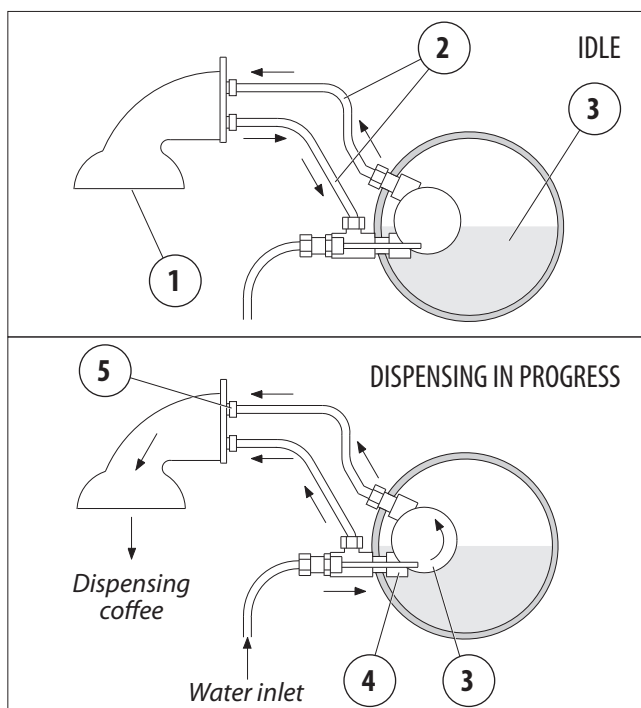
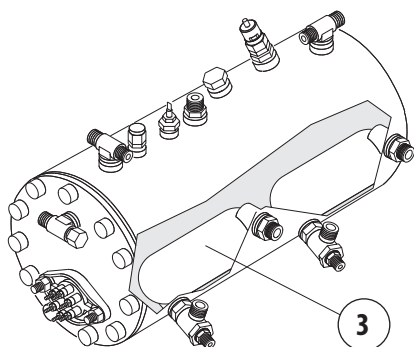


2.9.9 CTS group (with a thermosiphonic circuit)

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 when dispensing coffee, thus ensuring that all coffees are the same temperature:

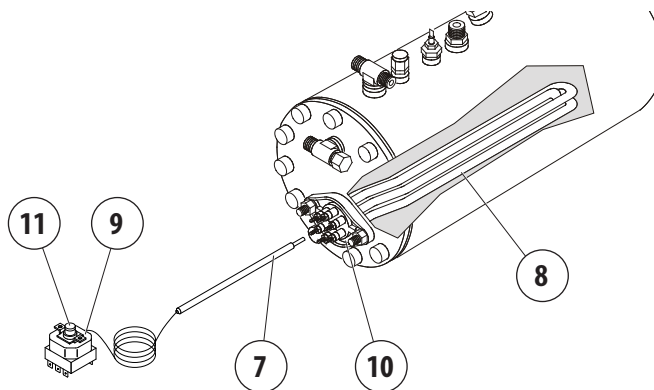
- The solenoid valve and the pump are activated in order to send cold water into the exchanger (3) through the injector (4).
- The heating unit water is carried from the exchanger (3) to the group (4) for dispensing.
- The pump allows the water flow pressure to increase to 8-9 bar for dispensing.

The injector (4) and the flow reducer (5) are important components for the dispensing group's operation. To increase the coffee extraction temperature, remove the flow reducer (5) or replace it with one that has a bigger diameter. To decrease the temperature, replace it with one that has a smaller diameter. If necessary, the exchangers can be replaced by removing the flange and disconnecting the relative hydraulic circuit pipes. These operations should be carried out when the machine has been switched off and has cooled down: always replace the seals.



2.9.10 Safety thermostat

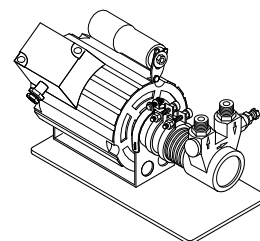
The thermostat prevents any damage occurring to the electrical heating element if there is no water in the heating unit. The thermostat bulb (7) is located inside a sheath (8) in the middle of the heating elements. The thermostat contacts (9) are connected to the electric heating element (10). If the electric heating element is exposed due to a failure to fill the heating unit with water, the temperature of the heating element increases dramatically. At this point, the thermostat cuts the power supply to the heating element in order to prevent damage occurring.



To reset the thermostat, press the centre button (11). However, before starting the machine up again, identify what prevented the water from being fed into the heating unit.

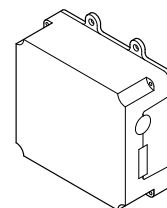
2.9.11 Motor pump

This component feeds the machine by increasing the water pressure to 0.8-0.9 MPa (8-9 bar) in order to dispense coffee and automatically fill the heating unit.



2.9.12 Electronic control unit

The electronic control unit is installed on the SAE versions. Its purpose is to electronically control the coffee dose via the water flowing through the dosing device and to check that the heating unit is being filled with water. Some versions of the control unit are set up to be connected to the dispensing accounting systems by means of a specific interface device.



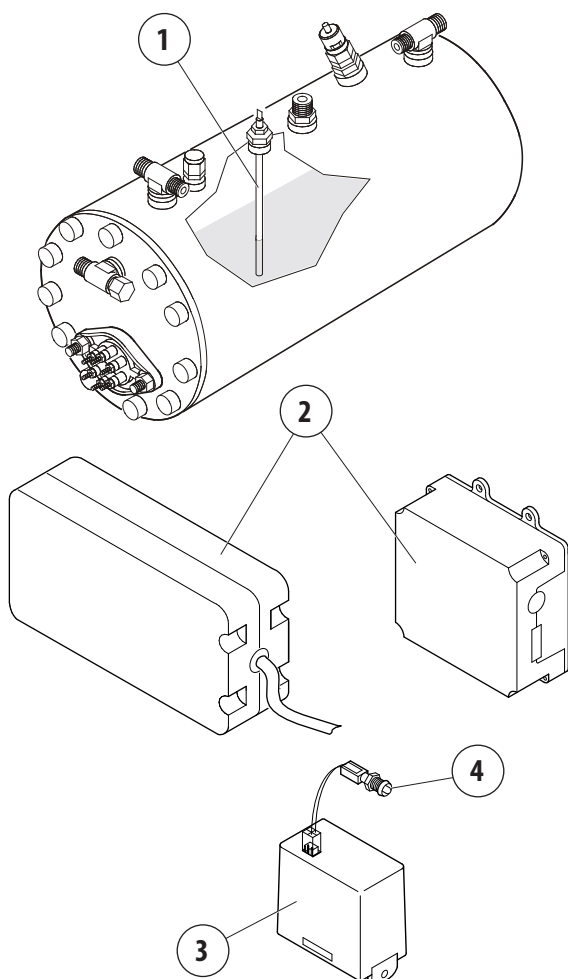
2.9.13 Automatic Water Entry

The Automatic Water Entry system is designed to check the water level in the heating unit. It consists of:

- A probe inserted into the heating unit (1) consisting of a stainless steel rod.
- The standard control unit (2) on SAE versions and the electronic level regulator on the other versions (3).
- A hydraulic circuit with a solenoid valve controlled by the regulator.

The electronic control unit controls the level of water in the heating unit. When the level of water in the heating unit drops, the contact with the probe is interrupted. The control unit sends an impulse to the inlet solenoid valve and the motor pump, which are then activated until the normal level of water in the heating unit has been restored.

To avoid any flooding caused by machine malfunctions or water leaks in the circuit, the electronic control unit has a "Timeout" feature which cuts off the automatic water filling function 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. When installing machines with three or four groups, the initial water filling time may exceed the established timeout limit. Should this occur, simply turn the machine off and then back on to restore normal operating conditions.

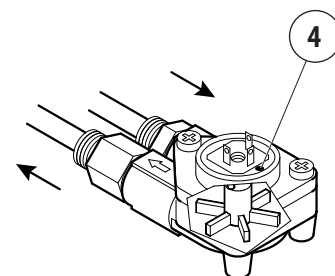


2.9.14 Volumetric dosing

The volumetric dosing device that is installed on the SAE versions, measures the quantity of water sent to the group in order to dispense coffee.

The dispenser generates electrical impulses which are sent to the electronic control unit. These impulses are read by the control unit and counted while the dose is being programmed.

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



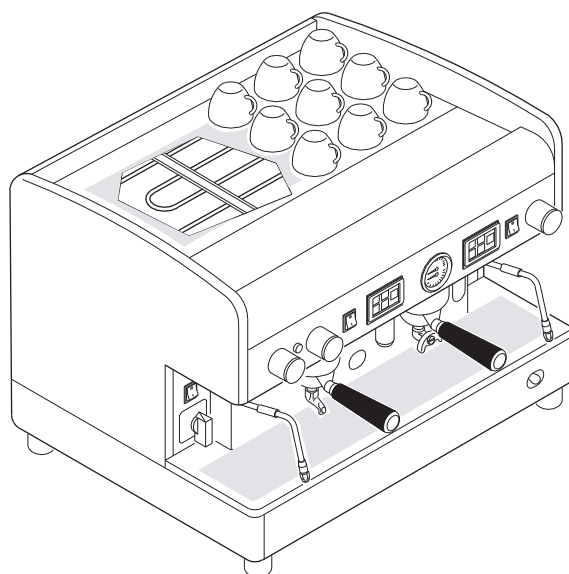
2.9.15 Electronic pushbutton panels

The electronic pushbutton panels on the SAE versions allow the coffee doses to be selected and programmed. They are connected to the electronic control unit.

To use and programme these, please consult the user manual.

2.9.16 Cup warmer

The cup warmer device warms the cups before they are used. In some versions it is possible to adjust the temperature by following the instructions on the user manual.



2.9.17 Hot water spout

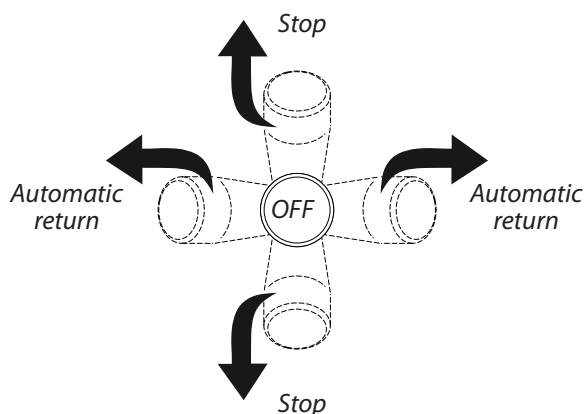
The hot water spout is connected to a heating unit suction hose. Depending on the model, hot water can be dispensed in two ways:

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

2.9.18 Steam nozzle

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

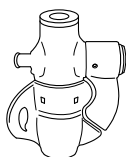
- Rotary knob: by turning the adjustment knob on the front of the machine.
- Lever knob: the steam is supplied through the horizontal or vertical movement of the knob.



2.9.19 Cappuccino maker (optional)

The cappuccino maker is installed on a steam nozzle. This device can both heat and froth the milk.

To adjust and clean the cappuccino maker, follow the instructions in the user manual.



2.9.20 Water filter

In the mains water, non-soluble salts are present which cause limestone to form in the heating unit and other parts of the machine.

Drinking water can also contain heavy metals and substances, such as chlorine which are 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.

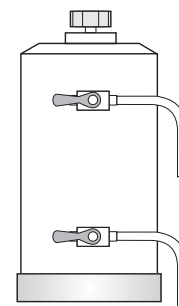


To use and maintain the water filter, follow the instructions provided in para. "7.4 Water filter maintenance" on page 49

2.9.21 Water 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 the water is very hard, it will be need to be regenerated more frequently. The same rule can be applied to locations where there is a large consumption of hot water (for tea, etc.).

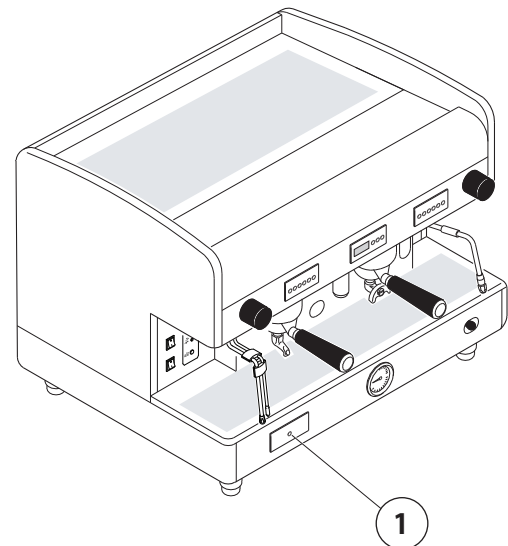


To use and regenerate the water softener, follow the instructions provided in para. "7.5 Water softener regeneration" on page 51.

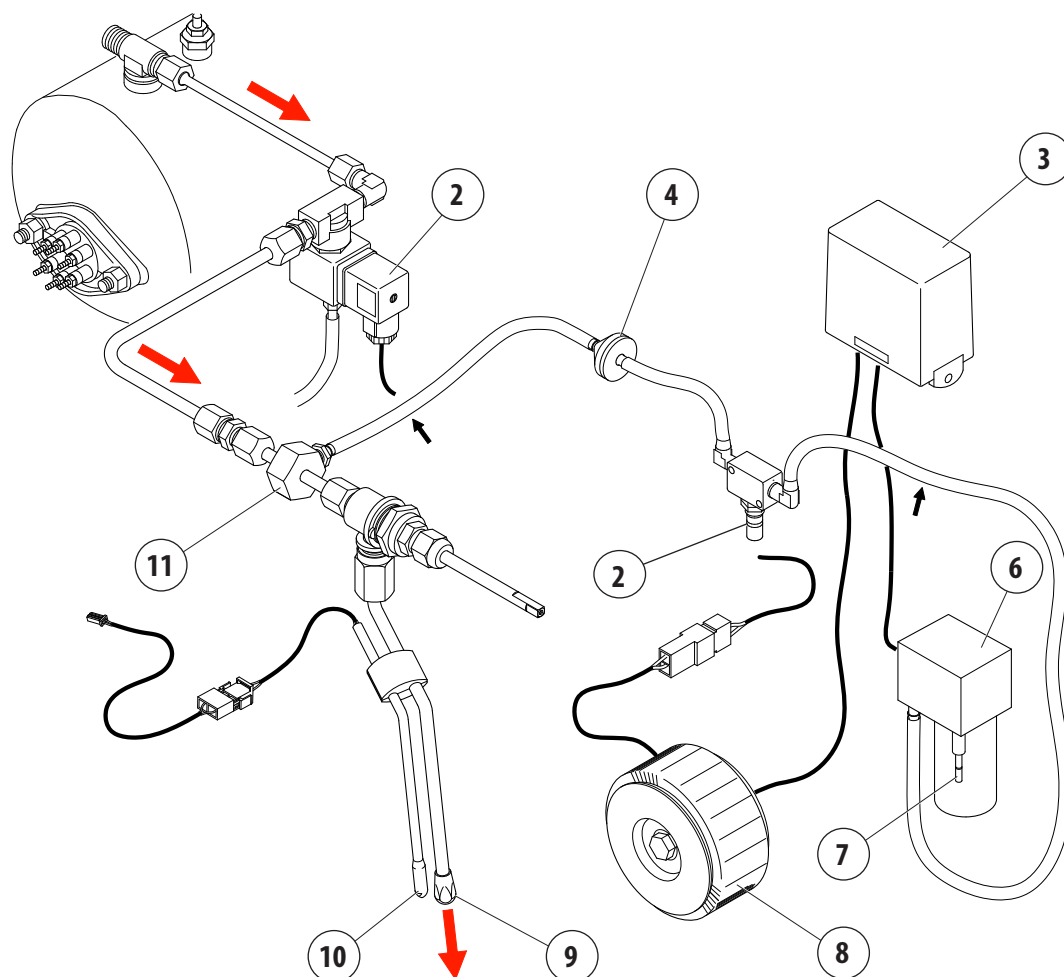
2.9.22 Automatic steam wand (optional)

The “Automatic steam wand” system - fitted on some versions with a display - enables milk to be automatically frothed at the programmed temperature. The operating principle of the automatic steam wand is listed below:

- Press the specific button (1), located on the left side of the machine's base.
- The solenoid valve opens (2) which consequently allows the steam to flow from the heating unit to the automatic steam wand nozzle.
- The system simultaneously activates the air suction pump (6) which is controlled by the control unit (3) and powered by the transformer (8). The milk froth can be adjusted by changing the amount of air intake when opening the valve (5).
- After the air has passed through the non-return valve (4), it mixes with the steam in the mixing interface (11).
- Steam comes out of the nozzle (9).
- The probe (10) that is connected to the machine's electronic control unit, detects the temperature of the milk while it is being heated.
- Once the set milk temperature has been reached, the electronic system stops the air and steam from being dispensed.



To adjust the milk temperature and froth, see para.



3. TRANSPORT AND HANDLING

3.1 Safety precautions



Carefully read the instructions provided in chapter "I. SAFETY PRECAUTIONS" on page 3.

3.2 PPE features

When transporting the machine, the following PPE is required:



The use of protective gloves is mandatory.



The use of safety shoes is mandatory.

3.3 Dimensions and weight

Model	1GR	COMPR.	2GR	3GR	4GR
Maximum gross weight	77 kg	100 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.

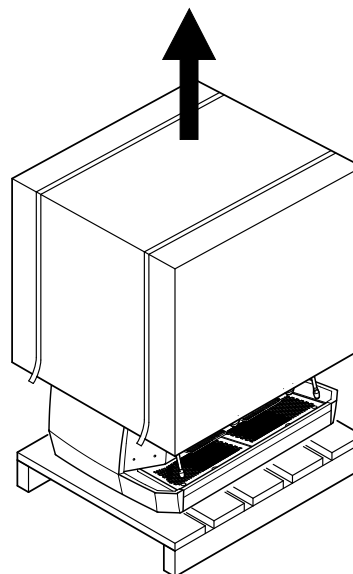


It is very important to check that the maximum load capacity of each piece of lifting equipment, is at least equal to the weight of the loads to be lifted plus the safety margins which are required by current standards.

3.5 Unpacking the machine

Only remove the machine from its packaging when it is ready to be installed, in order to prevent accidental collisions which could damage it:

- Open the packaging, taking care not to damage the machine.
- Remove and take out the machine guards and equipment inside the packaging.
- Remove the machine.
- Dispose of the packaging in compliance with the current waste regulations.



After unpacking the machine, check that there are no damaged parts due to transport or missing parts. Should there be any, immediately inform (no later than 7 days after delivery) both the CARRIER and the MANUFACTURER, by indicating the machine data and providing photographic evidence. We recommend that you keep the packaging until the guarantee has expired.

Wood, nails, staples, cardboard: non-polluting material which must be recycled properly.

Plastic: polluting material that must not be burned (danger of toxic fumes), nor disposed of as normal waste; 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 an Authorised Distributor.

4.2 Storing the machine after operation

If the machine is not used after a certain period of time, store it in the following conditions:

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

Store the machine taking the following precautions:


- Store in a closed environment.
- Protect it 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°C - +35°C
- Max. relative humidity: 50 % (at 40°C)

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

- Room temperature: premature degrading of the motors.
- Relative humidity: premature degrading of seals and electronics.

 **If the environmental features are significantly different than those listed, contact the MANUFACTURER before they become a potential problem.**

 **Before starting the machine up after it has been placed in storage, the equipment must be fully inspected.**

5. INSTALLATION

5.1 Safety precautions



Carefully read the instructions provided in chapter "I. SAFETY PRECAUTIONS" on page 3.



If the technician has not performed all the installation operations and the machine is then used, this may result in serious damage to the appliance and people.



If any work is carried out on the machine electronics when the machine is still live, any guarantee will automatically be invalidated.

5.2 PPE features

When installing the machine, the following PPE is required:



The use of protective gloves is mandatory.



The use of eye protection is mandatory.



The use of safety shoes is mandatory.

5.3 Environmental conditions

5.3.1 Room temperature

The electrical and electronic equipment that has been installed on the machine, has been designed and made to function properly in environments where the temperature is between +5 and +35°C.

5.3.2 Relative humidity

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

5.3.3 Altitude

The altitude of the installation site must not exceed 2000 m.

5.4 Installation and operation spaces

Before the machine arrives, a suitable environment must be prepared:

- The appliance is not suitable for installation in an area where a water jet may be used.
- The machine is not suitable for outdoor use.
- The machine must not be used inside kitchens.
- The room must be suited for the intended use with adequate space to comfortably use the machine.
- The lighting must be adequate and conform with current standards.
- The earthing system must comply with current standards.
- The electrical system must comply with current regulations.

5.5 Support base

To ensure a sufficient degree of ergonomics and machine safety, a support base with the following features must be made available (reference drawings on the next page):

- Ensure that there is sufficient space for the machine to be positioned and used correctly.
- The worktop (1) must be comfortable and able to withstand the machine's weight. The height of the upper section of the machine (19) must be at least 150 cm from the floor.
- The base must be perfectly level and have no irregularities.
- The terminals for connecting to the water mains (15) and electrical mains (9) must be in the immediate vicinity of the support base.
- The machine can also be positioned against a wall, but please leave enough space - at least 50 cm (3) - on the right and left for easy access during cleaning operations.
- Fit a drawer under the worktop (17) which will be used to deposit used coffee grounds and if possible, also fit a rubber support (18) to knock the filter holder against.



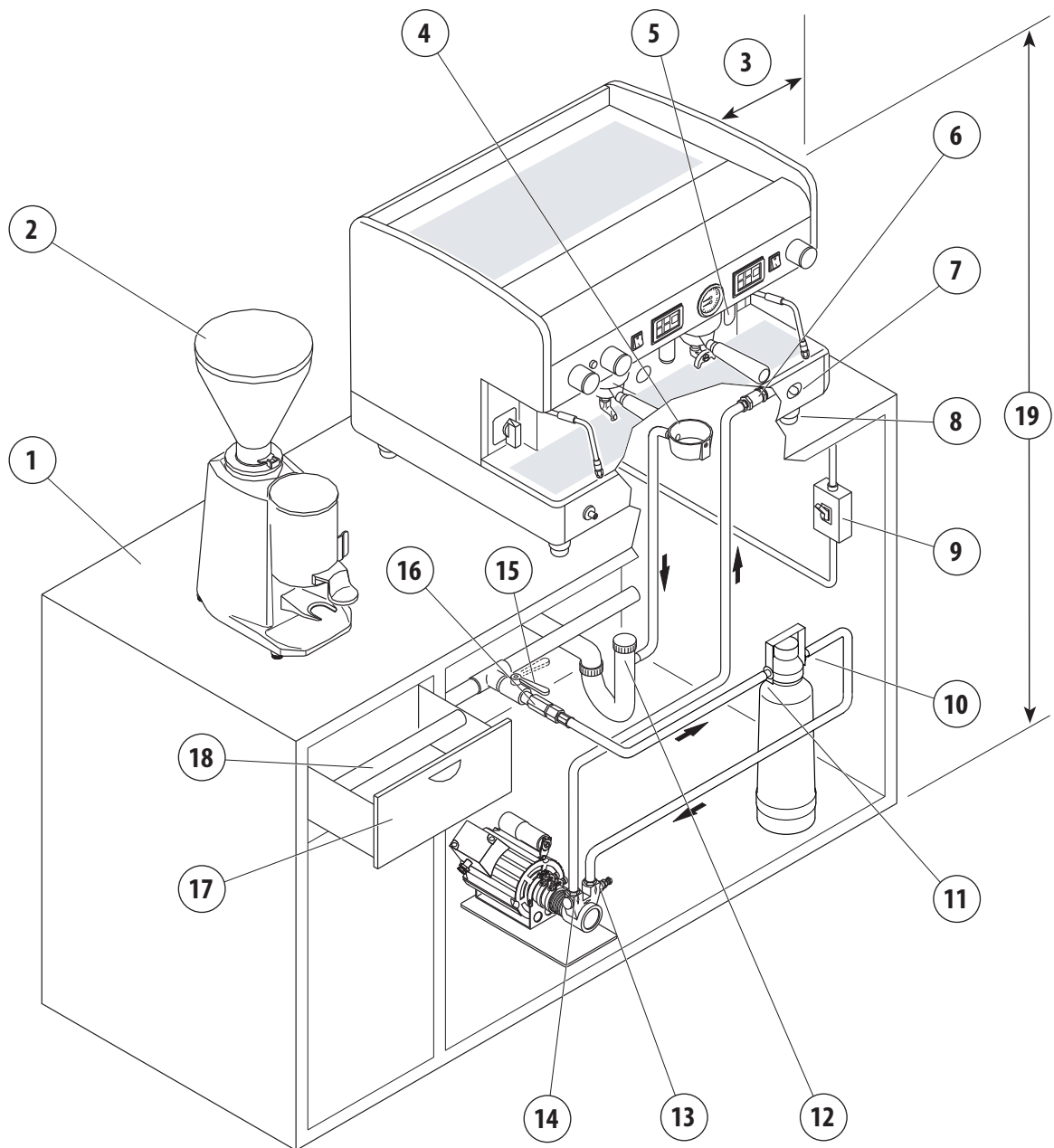
FOR THE USA: Replace the machine's feet (8) with the raised ones supplied.

The new feet must be firmly fastened to the machine by means of the specific nut.



In order to work properly and ensure safety, the machine must rest on a perfectly horizontal surface.

Any machine alignment adjustments must be carried out by adjusting the feet (8).

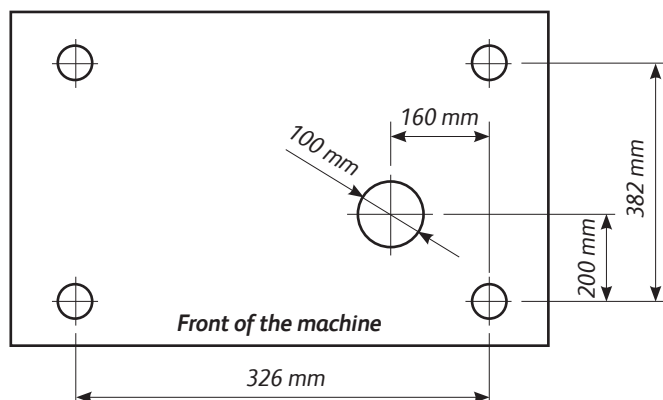


- | | |
|--|---|
| 1. Support base | 13. Motor pump inlet |
| 2. Grinder-dispenser | 14. Motor pump outlet |
| 3. 50 cm minimum distance between the machine and the wall | 15. Water mains valve |
| 4. Drain tray | 16. Water mains check valve |
| 5. Heating unit water level | 17. Used coffee grounds drawer |
| 6. Water mains inlet | 18. Support for knocking out the grounds in the filter holder |
| 7. Manually filling with water | 19. The minimum height of the machine top from the floor must be 150 cm |
| 8. Adjustable feet of the machine | |
| 9. Electrical mains switch | |
| 10. Water filter inlet | |
| 11. Water filter outlet | |
| 12. Sewer drain | |

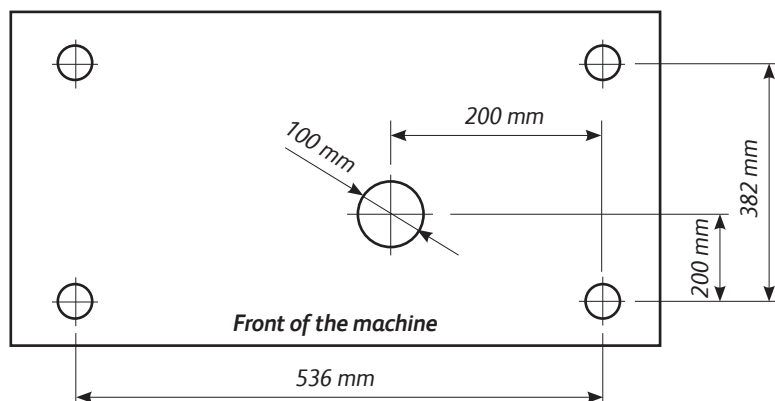
5.6 Drilling the support base

If holes need to be drilled into the support base to let the water inlet hoses, outlet hoses and power cables pass through, follow the directions given in the drawings below.

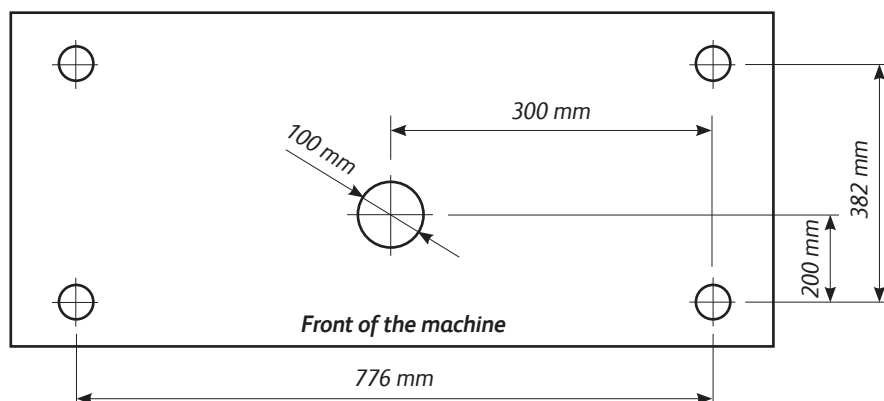
1 GROUP COMPACT



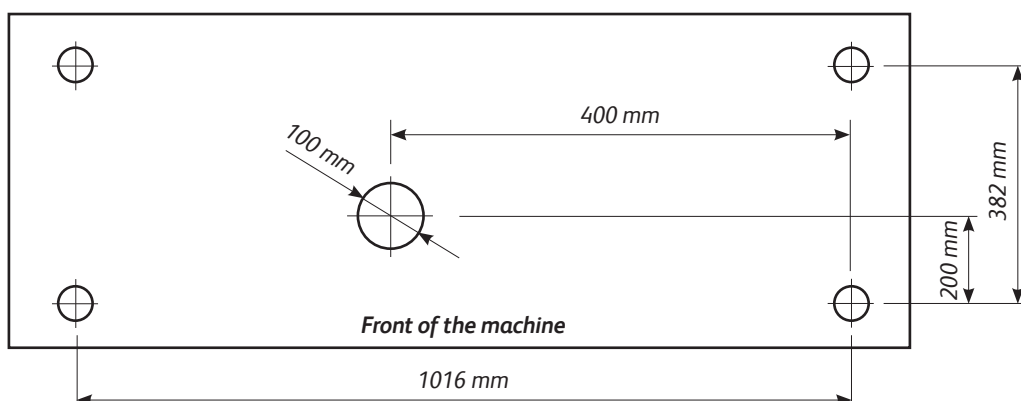
2 GROUPS



3 GROUPS



4 GROUPS



5.7 Hydraulic connection



Before connecting the hydraulic system, make sure the appliance has been disconnected from the electrical mains.

5.7.1 Water supply

The appliance's water supply must provide water which is suitable for human consumption, and must conform with the regulations in force in the place of installation. The owner/manager of the system must provide the Technician with confirmation that the water meets the above requirements:

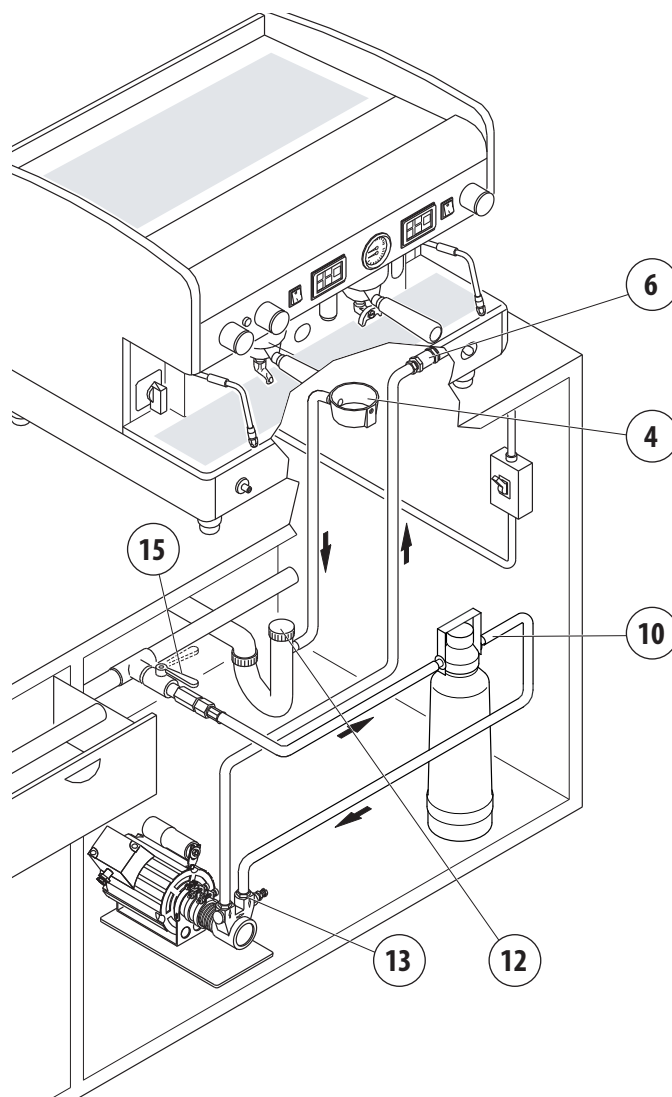
5.7.2 Materials to be used

When installing the appliance, only the components and materials supplied with the appliance are to be used. Should the use of other components be necessary, the Technician must verify that these are suitable for coming into contact with water used for human consumption.

5.7.3 Hydraulic connections

The Technician must carry out the hydraulic connections in accordance with the hygiene and hydraulic safety standards regarding environmental protection which are in force in the place of installation.

- Add a valve to the water supply in order to stop water flowing to the machine.
- In order to prevent damage, it is advisable to install the water purification filter where it will be protected from accidental blows.
- If there is no water purification filter (10) and/or motor pump (13), connect the water mains (15) directly to the machine's water inlet (6).
- When connecting the machine's tray (4) to the sewer drain (12), avoid overly tight curves or kinks, and make sure that there is a sufficient slope for water to flow to the drain.
- The drain must be connected to a siphon that can be inspected and periodically cleaned, in order to prevent unpleasant odours returning.
- To avoid oxidation building up and damage to the machine over time, do not use iron connections for the hydraulic system, even if they are galvanised.



After installation and before using the machine, the water in the hydraulic circuits must be replaced, as indicated in para. "6.7 Water renewal" on page 35.



New connecting pipes must be used every time that the machine is newly installed. Do not use old connecting pipes.



The water mains must supply cold water fit for human consumption (potable water) at a pressure between 0.15-0.6 Mpa (1.5 and 6 bar). If the pressure is higher than 0.6 MPa (6 bar), connect a pressure reducer before the pump.

All the filling couplings are 3/8 male gas types. The drain tray is connected to a pipe with an internal diameter of 20 mm.

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

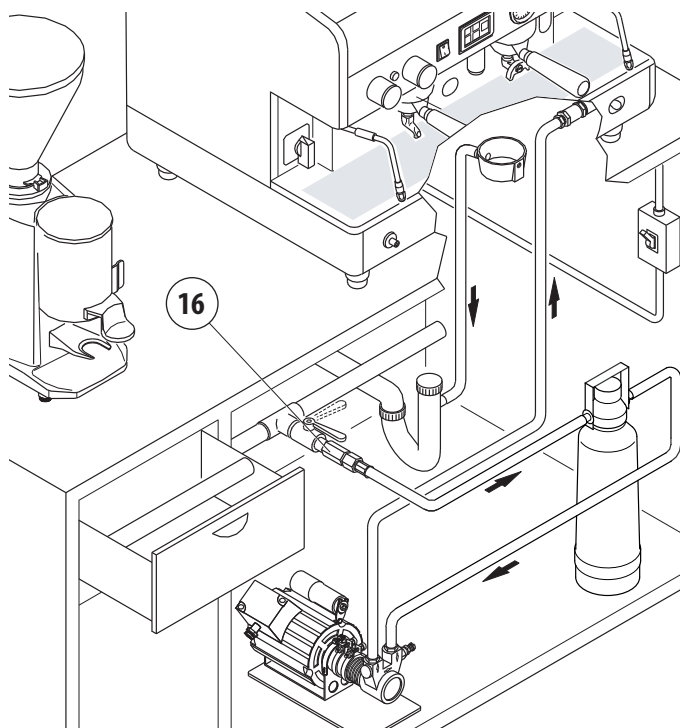
The machines are fitted with a "Timeout" device which allows the heating unit to be filled up with water within a maximum time. This function prevents water from flowing out of the heating unit's valve (flooding) and keeps the motor pump from overheating.



FOR THE EUROPEAN COMMUNITY: when connecting to a water mains or an external tank, a non-return valve (16) must be positioned upstream from the machine, as set forth by the EN 1717 standard.

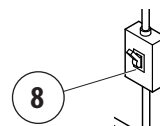


FOR THE USA - The water connections and drains must be made in accordance with the 2003 International Plumbing Code of the International Code Council (ICC), or the 2003 Uniformed Hydraulic Code of the IAPMO. The machine must be installed with a suitable non-return valve as set forth by the national standards.



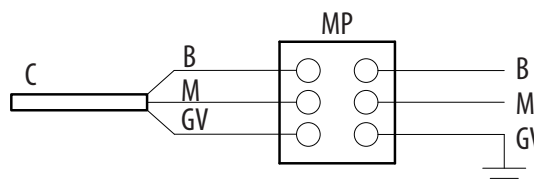
5.7.4 Electrical connection

- The conformity of the electrical system, effectiveness of the earthing system and functionality of the differential circuit breaker - all of which are fundamental for guaranteeing the appliance's electrical safety - are the responsibility of the person in charge of the electrical system on which the equipment is installed.
- Before installation, make sure that the electrical system is equipped with the protection device (8), as indicated in the safety notes on page 30.
- To connect the machine to the electric mains, refer to Chap. "13. WIRING DIAGRAMS" on page 61.
- Do not use extension leads or electrical adapters for multiple outlets.
- 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 leave the area immediately when needed.



If an external motor pump is being used, proceed as follows:

- Connect the motor pump cable (with the smaller cross-section) to the connector of the external motor as shown in the diagram below.
- Connect the machine power cable (with the larger cross-section) as indicated in Chap. "13. WIRING DIAGRAMS" on page 61.



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



Every electrical connection operation must be carried out with the mains off and the power supply disconnected. The Technician must also check that there is no voltage present, by using a multi-meter, for example.



The electrical system must be equipped with a protection device (8) that ensures an omnipolar disconnection from the mains with a contact opening distance in overvoltage category III conditions and which guarantees a suitable residual-current device, equal to 30 mA, in compliance with current laws and safety regulations.



Always connect the motor pump cable before the machine power supply cable, by following 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 any guarantee.

We recommend that you promptly report any problems encountered during the appliance's installation to the Manufacturer.



FOR GERMANY

The following requirements must be observed for installation:

- The regulation regarding the local police and the fire department.
- The regulation regarding the workplace.
- The technical regulation on suction in terms of fire-proofing.
- DVGW G634 worksheet: "technical rules for stoves-gas appliances".
- DVGW G600 worksheet: "technical rules for gas installations".
- Technical rules (TRF) for liquid gas installations.
- Rules regarding accident prevention.
- Gas supplier rules.

5.8 Gas connection (if fitted)

5.8.1 Requirements



When operating on gas, the machine emits combustion fumes directly into its surrounding environment; therefore, gas-powered machines must not be installed in rooms with a volume of less than 12 m³, as described by the current standards. When indoors, always provide air vents so that any gas leaks can escape.

Do not under any circumstances attempt to light the gas without first installing the proper injector.

Do not start up the gas burners when the heating unit is empty.



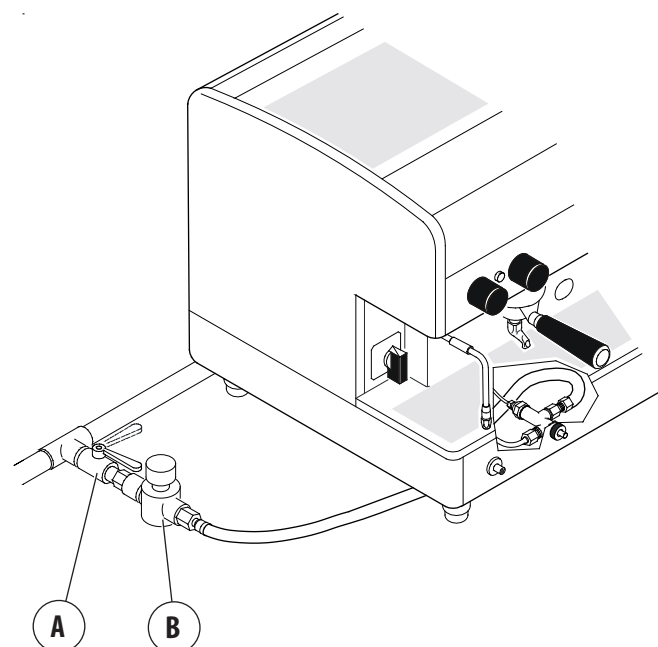
FOR ITALY

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

5.8.2 Gas system connection

To connect the gas system, proceed as follows:

- Install a gas shut-off valve upstream of the machine (A).
- Install a gas pressure reducer upstream of the machine (B).
- The gas must be connected to the machine via a pipe in accordance with the current regulations of the country of installation using either a hose or rigid pipe.

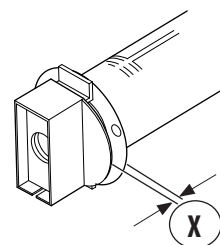
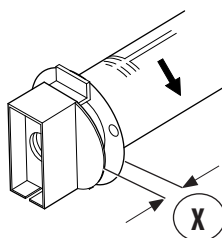
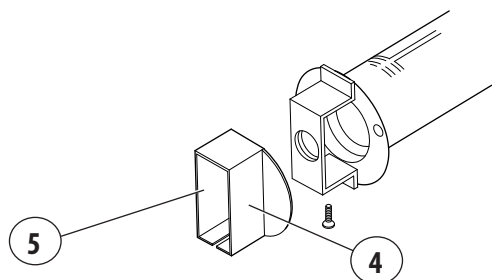
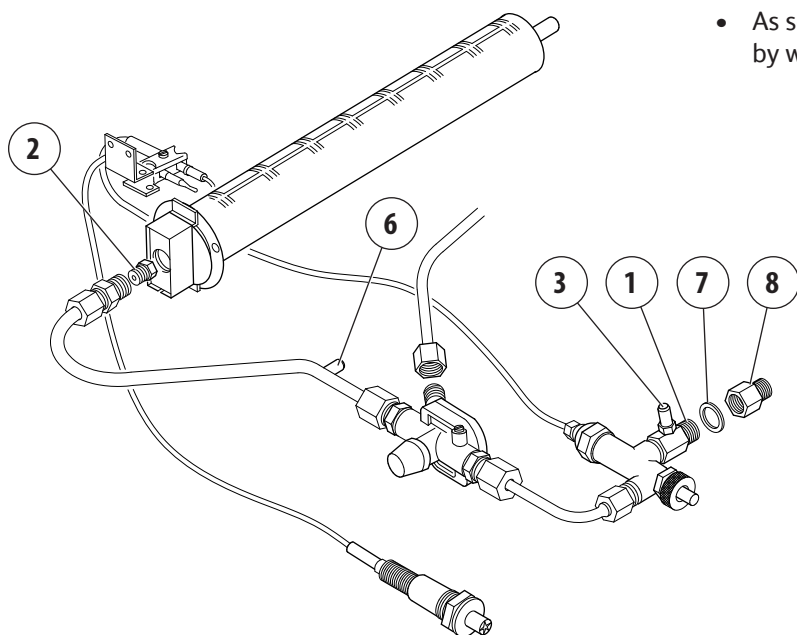


- If connecting with a hose, follow the instructions below:
 - Use a hose that complies with the current regulations (it is important to periodically replace it as indicated on the hose's stamp).
 - The hose must not be any longer than 1 metre.
 - Attach the hose to the connector (1) and if necessary, install the conical connector (8) and its seal (7).
 - The hose must not be placed near potential heat sources and in any case, must not reach a temperature higher than 50°C.
 - The hose must not be subjected to traction or twisting stress, and must not have any kinks. It must be possible to inspect the hose along its entire length, and it must not come into contact with sharp edges or corners.



If the hose needs to be connected to the machine, we supply a conical fitting (8) with seal (7) to be installed on the cylindrical fitting (1).

- When connecting with a rigid pipe: connect the Ø8 copper pipe to the 1/4 gas fitting (1).
- Check that the type of gas used corresponds to the one indicated on the machine's gas dataplate. If a different gas is used, replace the injector (2) as shown in the Gas Table in para. "5.8.3 Gas table" on page 31 and replace the "Gas preparation" label on the heating unit cover with one corresponding to the gas being used (supplied with the injector). Ensure that there is a correct supply pressure by connecting a pressure gauge to the fitting (3) and check that the injector inlet has the correct minimum pressure by connecting a pressure gauge to the fitting (6).
- Check that the amount of air intake (X) corresponds to the amount indicated in the Gas Table; see para. "5.8.3 Gas table" on page 31.
- To carry out any adjustments, proceed as follows:
 - Loosen the screw (4).
 - Move the extraction guard (5) to the required height.
 - Tighten the screw (4).
 - If, when starting the burner, the colour of the flame is not blue, slightly modify the air intake height until the correct colour is obtained.
- As soon as it has been connected, check for any gas leaks by wiping all the connections with a soapy solution.



5.8.3 Gas table

Instructions for installing the appropriate injector and adjusting the air extraction guard.

	Gas type	Supply pressure	Injector inlet minimum pressure	Burner injector hole	Air intake extraction guard	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	-
	G25.3	20/25	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	-
	G25.3	20/25	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	-
	G25.3	20/25	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	-
	G25.3	20/25	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

INTERNATIONAL SYSTEM-CONVERTED (SI) UNITS OF MEASUREMENT

1 mbar	=	100	PA
1 mm	=	0.001	m
1 kW	=	1000	W
1 m ³ /h	=	2.78 x 10 ⁻⁴	m ³ /s
1 kg/h	=	2.78 x 10 ⁻⁴	kg/s

5.8.4 Gas system connection

To adjust the gas proceed as follows:

1. Turn on the gas system.
2. Remove the locknut (A) and loosen the adjustment screw (B) by turning it twice.
3. Turn the regulator pin (C) in order to have the maximum opening for the flow of gas.
4. Wait for the pressure in the heating unit to reach 1.4 bar (see the heating unit pressure gauge).
5. Turn the regulator pin (C) clockwise until the burner flame is barely visible (pilot flame) but sufficient to keep the thermocouple active (see the data in the Gas table): check the minimum pressure via a gauge located on the fitting (D).
6. Wait until the heating unit pressure reduces to 1 bar (see the heating unit pressure gauge).
7. Turn the adjustment screw (B) by screwing it in a clockwise direction until the flame is at its maximum.
8. Tighten the locknut (A) to lock the regulator screw in place (B).
9. Wait until the operating pressure in the heating unit - which is shown on the machine's pressure gauge - reaches the working value of around 0.11-0.13 MPa (1.1-1.3 bar).

If you would like to increase or decrease the operating pressure in the heating unit, proceed as follows:

TO DECREASE PRESSURE

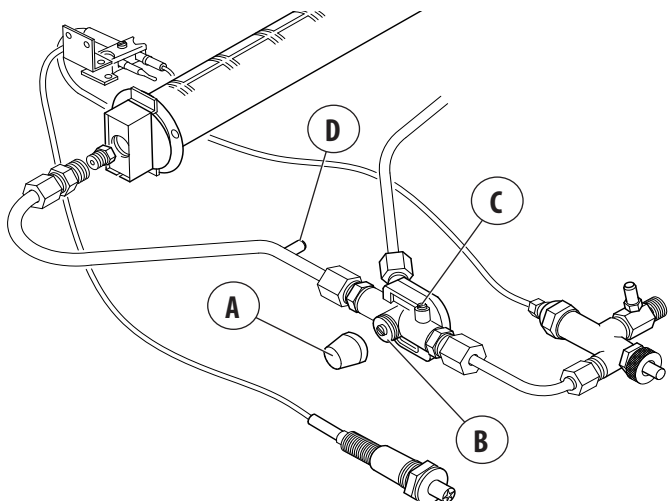
Set the minimum to 0.09 MPa (0.9 bar) and the maximum to 0.13 MPa (1.3 bar) and you will obtain a pressure in the heating unit of approx. 0.10-0.12 MPa (1.0-1.2 bar).

TO INCREASE PRESSURE

Set the minimum to 0.11 MPa (1.1 bar) and the maximum to 0.15 MPa (1.5 bar) and you will obtain a pressure in the heating unit of approx. 0.12-0.14 MPa (1.2-1.4 bar) [this value is the maximum recommended pressure limit].

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

i The gas system is useful for heating the water in the heating unit. It does not, except in special cases, substitute the electrical heating system. Machines with levers can run with electric or gas.



6. COMMISSIONING

6.1 Safety precautions



Carefully read the instructions provided in chapter "I. SAFETY PRECAUTIONS" on page 3.

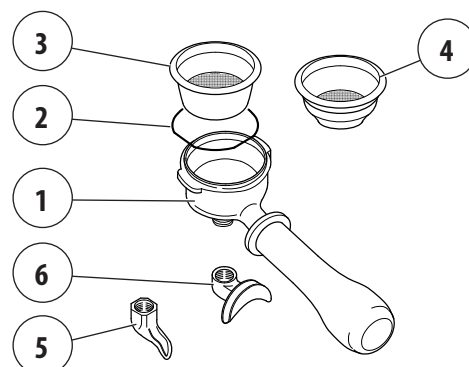
6.2 Preparing the filter holders

6.2.1 Filter holders

- Place the filter-holding spring (2) in the housing of the filter holder (1).
- Take the (3) or (4) one-cup filter and press it firmly into the filter holder.

6.2.2 Spouts

Finish preparing the filter holder by fitting the spout for one cup (5) or two cups (6).



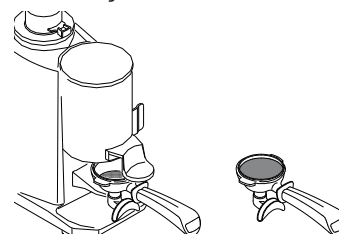
Properly connect the single filter with the single spout and the double filter with the double spout.

6.2.3 Grinding and dosing coffee

It is important to have a grinder-dispenser next to the machine so that the coffee can be ground on a daily basis.

To adjust the coarseness of the ground coffee, use the appropriate regulator located on the grinder-dispenser hopper. The coffee must be ground and dispensed according to instructions provided by the manufacturer of the grinder-dispenser. The following points should also be kept in mind:

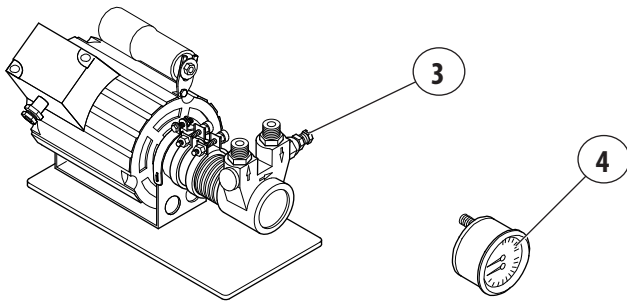
- To obtain a good espresso it is not recommended that you store large amounts of coffee beans. Comply with the expiry date indicated by the producer.
- Never grind large volumes of coffee, it is advisable to prepare the amount that can be held in the dosing device and if possible, use it by the end of the day.
- Do not buy pre-ground coffee, as it perishes quickly. If necessary, buy coffee in small vacuum-sealed packs.



6.2.4 External motor pump adjustment

To adjust the operating pressure, proceed as follows:

- Press a coffee dispensing switch.
- Adjust the pressure by turning the screw located on the pump (3) so as to obtain a value between 0.8 and 0.9 Mpa (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 of the machine.
- Switch off the dispensing switch.



6.2.5 Coffee grind

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

6.3 Lighting (if fitted)

6.3.1 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.

6.3.2 Spouts

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

6.4 Cup warmer (if fitted)

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

6.5 Automatic steam wand (if applicable)

6.5.1 Adjusting the temperature

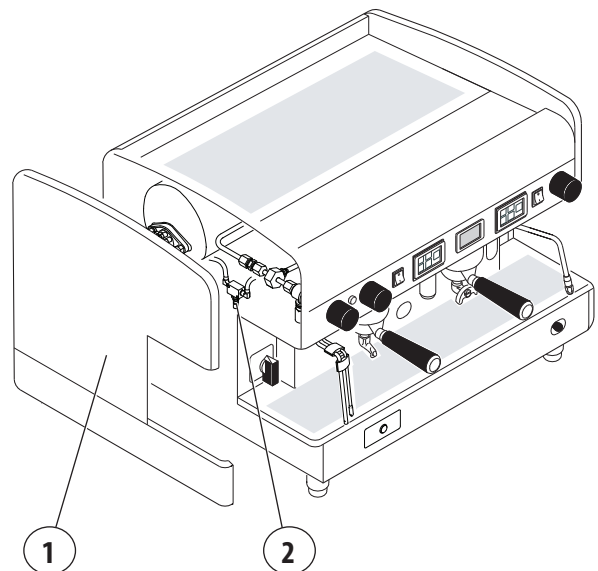
To program the temperature of the milk to be heated, enter the machine programming through the display and set the desired temperature.

However, we recommend that this does not exceed 60°C.

6.5.2 Adjusting the milk froth

To adjust the automatic steam wand milk frothing settings, proceed as follows:

- Remove the left side panel from the machine (1).
- Turn the screw of the adjustment valve (2):
 - To reduce the froth, turn it clockwise.
 - To increase the froth, turn it anticlockwise.
- Reposition the side (1) on the machine.



6.6 Turning the machine on and off



During the machine's heating-up phase (which varies depending on the model), the negative pressure valve will release steam for a few seconds until the valve closes.



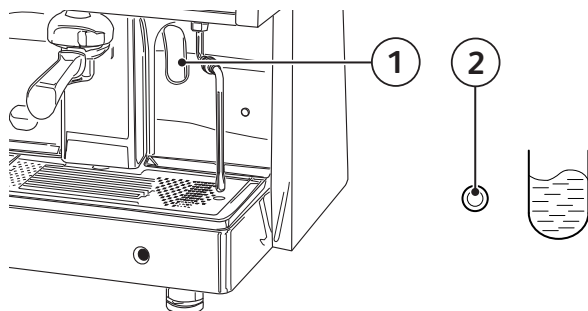
If the machine is inactive for longer than a week, the Technician must replace 100% of the water inside the hydraulic circuits.

Before turning the machine on, proceed as follows:

- Open the water valve of the water mains and softener.
- Make sure that the level of water in the heating unit is higher than the minimum level indicated on the water level window (1).



The level window is replaced with a green indicator light (2) in some versions: when lit, it indicates the correct water level in the heating unit and when it flashes slowly, it indicates that the water is being loaded.



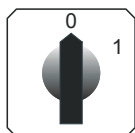
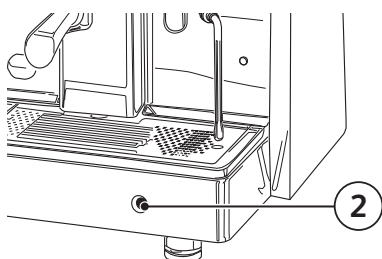
If there is no water (first installation or after heating unit maintenance), the heating unit must be filled in advance in order to prevent the heating element from overheating.

6.6.1 Electric heating (versions without Display)

Depending on whether a switch or power switch is installed on the machine, proceed as indicated in the below-indicated specific procedure:

SWITCH

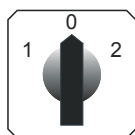
- Open the water mains valve.



- Turn the switch to the manual fill function (2) and fill the heating unit with water until the optimal level is restored.
- Turn the switch to position "1" and wait for the machine to warm up completely.

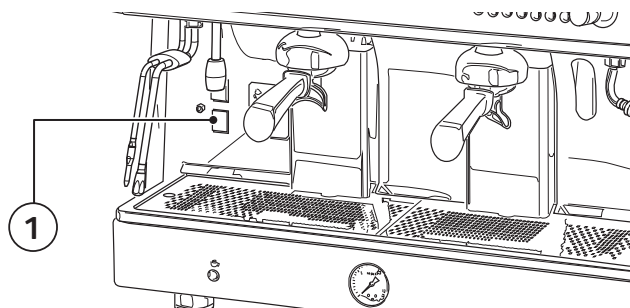
POWER SWITCH

- Open the water mains valve.
- Turn the power switch to position "1" (electricity is supplied to the pump to automatically fill up the appliance's heating unit and steam heating unit) and wait for the heating unit to be automatically filled with water.
- Turn the main switch to position "2" (full electricity is supplied, including to the heating element in the heating unit) and wait for the machine to warm up completely.



6.6.2 Electric heating (versions with a Display)

- Press the machine's main switch (1).



- Wait for the heating unit to be automatically filled with water, if necessary.
- Wait another second or so for the automatic test to be carried out.

WAIT
FUNCTIONAL TEST

TEST RESULTS
- OK -

- The machine is ready for use when the following messages appear on the display:

1.0 BAR 120°C
09:16 09-10-12 5

Heating unit pressure	Heating unit temperature	Programming indicator
1.0 BAR	120°C	P
09:16	09-10-12	5
Time	Date	Day of the week:



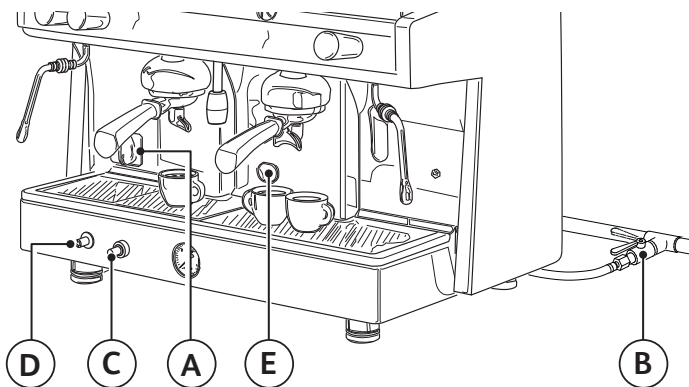
See the days of the week reference table in paragraph "Programming a Working Day" on page 42.



If the temperature inside the heating unit is lower than 90°C (machine's heating-up phase), the message LOW will appear on the display. To restart the machine, press and hold the same buttons for 3 seconds.

6.6.3 Gas heating (if a gas system has been installed)

- Turn the power switch (A) to position 1.
- Open the gas valve (B) on the mains.
- Press and hold the button (C) and simultaneously press the ON button (D). Once the flame has ignited, hold down the knob (C) for a few seconds, to allow the thermocouple to activate correctly.
- Then check that the flame has ignited through the window (E).
- Wait for the operating pressure shown on the pressure gauge to reach the working value of 0.1-0.12 MPa (1-1.2 bar).



6.6.4 Electric + gas heating (if a gas system has been installed)

i During the machine's heating-up phase (roughly 20 minutes), the negative pressure valve will release steam for a few seconds until the valve closes. Do not open the gas mains when the heating unit is empty.

- Proceed as indicated in the previous paragraph.
- After checking that the flame has ignited, turn the power switch (A) to position 2. In this way the heating unit's heating element is powered and the operating pressure will be reached more quickly.
- Wait for the operating pressure shown on the pressure gauge to reach the working value of 0.1-0.12 MPa (1-1.2 bar).

6.6.5 Turning off the machine

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

6.7 Water renewal

When the machine is being installed, the Technician must replace the water inside the hydraulic circuits by following these steps:

- When the installation is complete, the appliance must be started, brought to the nominal working condition and left in the "ready-to-operate" status for 30 minutes.
- Next, the appliance has to be turned off and fully emptied of the first water introduced into the entire hydraulic circuit, in order to eliminate any initial impurities.
- The appliance must then be filled again with water and brought to nominal working conditions.
- Upon reaching the "ready-to-operate" status, the following dispensing operations must be performed:
 - Continually dispense from each coffee group, in order to empty at least 0.5 litres from the coffee circuit. If there are several dispensing points attached to the same exchanger/coffee heating unit, divide the volume by the number of dispensing points.
 - Empty the heating unit of all its hot water by continuously dispensing through the specific spout. If there are multiple dispensing points, divide the volume by the number of dispensing points.
 - Continuously release steam for at least 1 minute from each steam dispensing point.



If the machine remains inactive for longer than a week, the Technician must renew 100% of the water inside the hydraulic circuits, as indicated above.



Before using the machine, run a few empty dispensing cycles with the filter holder attached for a few seconds to release any air inside the circuit and in turn, allow the dispensing groups to fully heat up.



Before using the machine, dispense a few coffees to test the grind fineness and to check the operating pressure of the machine.

6.8 Dispensing coffee



Do not remove the filter holder from the dispensing group when coffee is being dispensed.

The coffee dispensing method is different for each machine type; therefore, the instructions specific to the model being used must be followed.

In any case, before dispensing, the filter holder must be filled as described in the next paragraph.

6.8.1 Preparing the filter holder



Before filling the filter holder, make sure it is empty and any previous coffee residue has been removed.

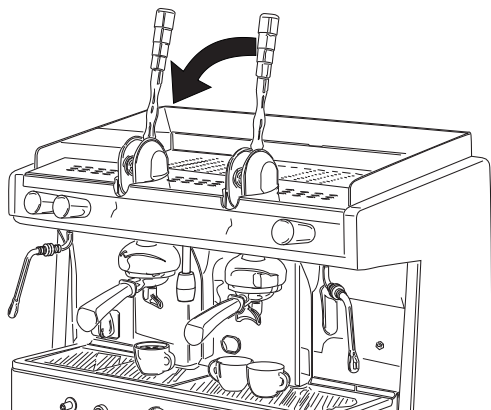
- Fill the filter with a dose of ground coffee (approx. 6-7 g); follow the procedures specified by the manufacturer of the grinder-dispenser.
- Tamp the coffee with the special tamper.
- Clean the rim of the ground coffee filter before attaching the filter holder to the dispensing group.
- Hook the filter holder to the group without closing it too tightly in order to prevent the gasket from wearing quickly.

6.8.2 “AL” version

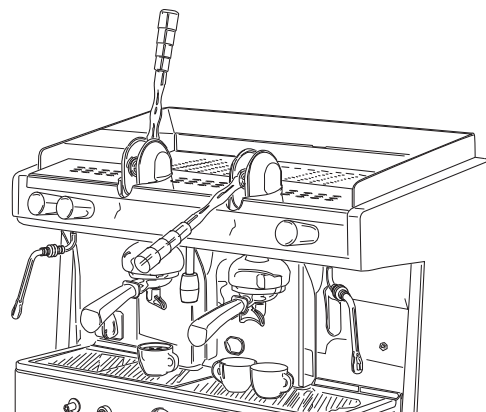


Never perform the below-described operations without coffee in the filter or without the filter holder attached to the dispensing group. The rapid upward movement of the lever may cause damage to the appliance, individuals or property. The dispensing time depends on the grind fineness and the amount of coffee in the filter holder.

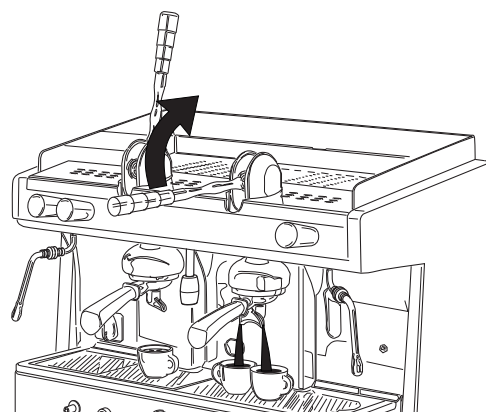
- Place a cup/demitasse under the group’s dispensing spout.
- Pull the lever all the way down.



- Whilst the lever is down, wait a moment (3-5 seconds) for the coffee to be pre-infused.



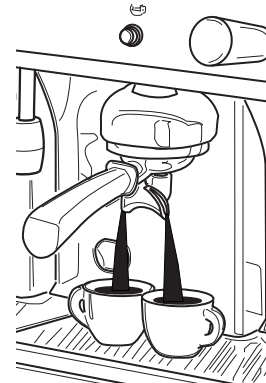
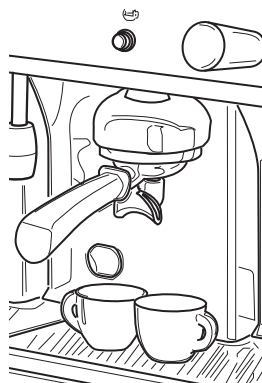
- Next, **carefully** lift the lever until some resistance is felt, then release the lever.



- The lever will continue ascending to its idle position, during which time the coffee will be dispensed. Wait for the coffee to finish dispensing.

6.8.3 “AEP” version

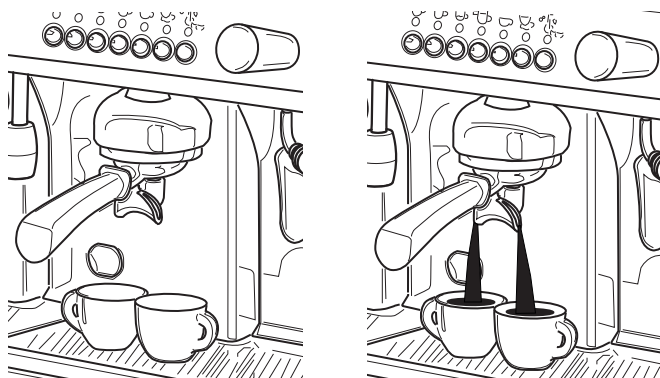
- Place a cup/demitasse under the group’s dispensing spout.
- Press the desired dispensing button : the machine will start dispensing coffee; when the desired amount of coffee has been dispensed into the cup, press the switch again to stop dispensing.



6.8.4 “SAE - DISPLAY” version

DISPENSING COFFEE

- Place a cup/demitasse under the group’s dispensing spout.
- Press the desired dose button, e.g. ☕ and wait for the coffee to be dispensed (LED will switch on).



- To stop the coffee dispensing ahead of time, press the ☕ or PROG STOP button.

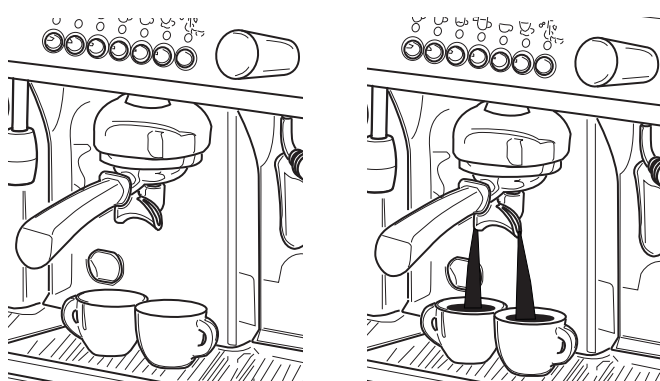
i Should an anomaly occur or the pushbutton panel freeze, use the manual switch (see the “AEP” version).

PROGRAMMING THE COFFEE

i Each dose must be programmed with freshly ground coffee and not with previously-used coffee grounds.

The machine is programmed by default. Should the coffee doses need to be modified, proceed as follows:

- Always programme the pushbutton panel of the right-most group first. This way, all the pushbutton panels will be automatically programmed. If necessary, subsequently programme the others.
- Place a cup/demitasse under the group’s dispensing spout.
- Press the PROG STOP button for at least 5 seconds, until all the dose button LEDs are lit.
- Press the dose button that you would like to programme, e.g. ☕ (the button will flash whilst it is being programmed).



- To confirm the dose, press the ☕ button again or the PROG STOP button.
- If desired, repeat this operation for the other dose buttons.
- When the programming is complete, press the PROG STOP button until all of the LEDs on the pushbutton panel go off.

i All the groups will now be programmed this way. Should you wish to programme them differently, proceed to singularly programme the left-hand groups one by one as illustrated above.

6.9 Dispensing steam

The steam dispensing method is different for each machine type; therefore, the instructions specific to the model being used must be followed.

To optimally froth the milk, follow these simple rules:

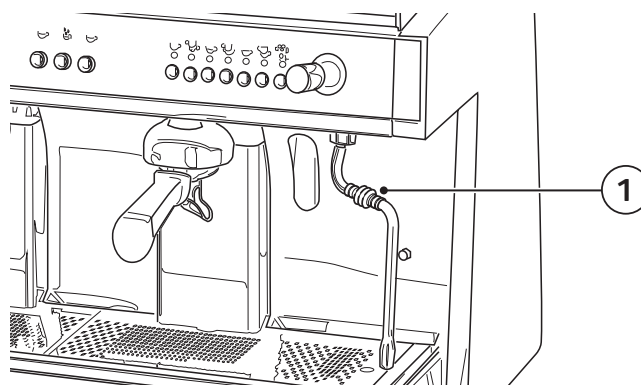
- Heat only the amount of milk you intend to use; once heated, it will have to be completely poured from the jug and not heated again.
- Froth the milk which should be at a temperature of around 4°C.

In any case, before proceeding to dispense steam, the following precautions must always be followed.



Carefully move the steam nozzle using the specific anti-scald rubber grip (1).

Do not direct the steam towards hands or other parts of the body. Do not touch the steam nozzles with bare hands; use the appropriate PPE.



Before using the steam nozzle, the condensation draining operation must always be carried out for at least 2 seconds.



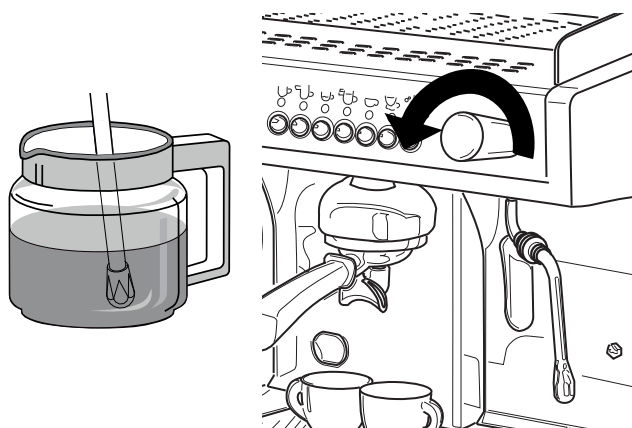
To keep the steam nozzle tips in perfect working order, it is advisable to carry out a brief dry dispensing run after each use. Keep the tips clean at all times using a cloth dampened in lukewarm water. Only leave the steam wand immersed in the milk for the time needed to heat it.



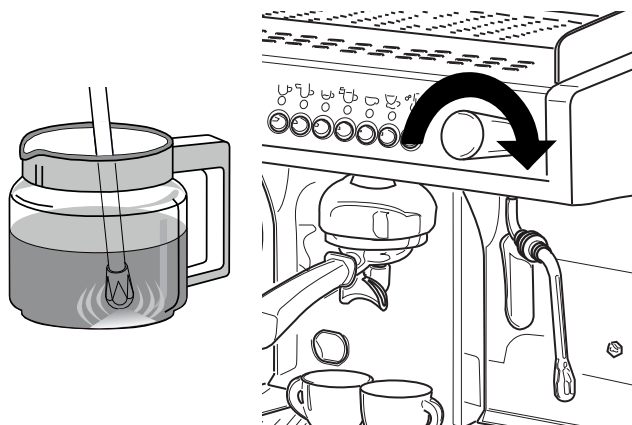
Do not open the steam valve with the steam wand immersed in milk and the machine switched off, as the latter would suck milk into the pipes.

6.9.1 Control knob version

- Immerse the steam nozzle into the liquid to be heated.
- Rotate the valve knob anticlockwise.

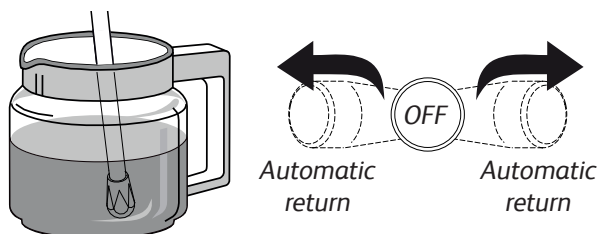


- The quantity of steam dispensed will be proportional to how open the valve is.
- To stop dispensing, turn the valve's knob clockwise.



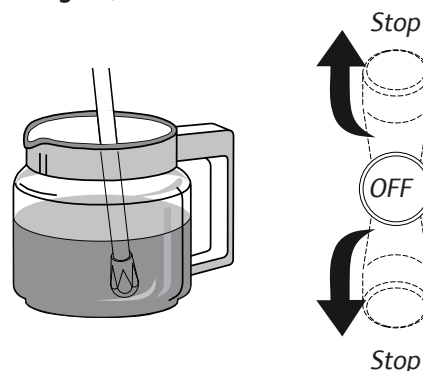
6.9.2 Lever knob version

- Immerse the steam nozzle into the liquid to be heated.
- Move the valve lever horizontally to start dispensing steam (it can be moved in any horizontal direction, as shown in the figure).



- The quantity of steam dispensed will be proportional to how far the lever has been moved.
- To stop dispensing steam, release the lever; it will automatically return to its central position.

i To continuously dispense steam, move the lever in a vertical direction until it reaches the locked position, by hooking it in the constantly open position (it can be moved in either vertical direction, as shown in the figure).



Move the knob back to its central position to stop dispensing.

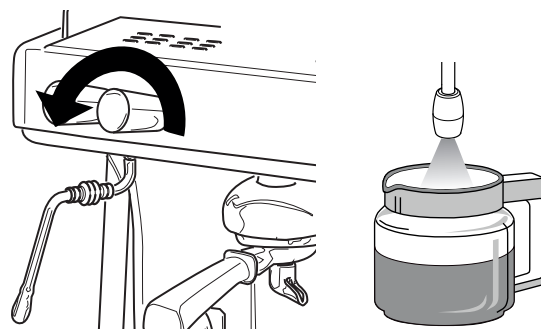
6.10 Dispensing hot water

Danger of scalding. Do not direct hot water towards hands or other parts of the body. Do not touch the hot water nozzle with bare hands; use the appropriate PPE.

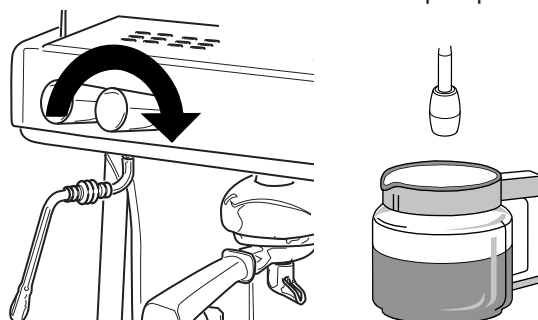
The hot water dispensing method is different for each machine type; therefore, the instructions specific to the model being used must be followed.

6.10.1 AL - AEP" versions

- Place the jug under the hot water nozzle.
- Rotate the valve knob anticlockwise.





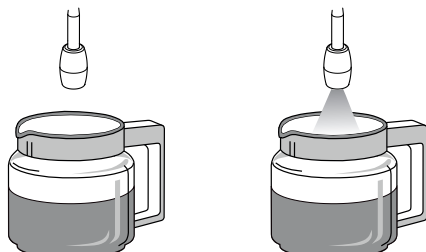
- The quantity of hot water dispensed will be proportional to how open the valve is.
- When the desired quantity of water has been dispensed, turn the valve knob clockwise to stop dispensing.



6.10.2 “SAE - DISPLAY” versions



DISPENSING HOT WATER

- Place the jug under the hot water nozzle.
- Press the water button  and wait for the hot water to be dispensed.
- The machine dispenses a programmed quantity of hot water; to stop it from dispensing ahead of time, press the hot water dispensing button  again or press the **PROG STOP** button.



PROGRAMMING THE HOT WATER

The machine is programmed by default. Should the hot water doses need to be modified, proceed as follows:

- Place the pot under the hot water spout.
- Press the **PROG STOP** button for at least 5 seconds, until all the dose button LEDs are lit.
- Press the hot water dispensing button  to start dispensing.
- When the desired amount of water has been reached, press the  button again to confirm the dose.
- When the programming is complete, press the **PROG STOP** button until all of the LEDs on the pushbutton panel go off.

6.11 Dispensing with the automatic steam wand

6.11.1 Tips regarding its use

- Only froth the amount of milk that you intend to use; once heated, the milk will have to be completely poured out of the jug and cannot be reheated.
- The automatic steam wand only guarantees an accuracy of $\pm 3^{\circ}\text{C}$ between the set temperature and the actual milk temperature, if the starting milk temperature is 4°C .
- As the steam automatically stops dispensing when the set milk temperature is reached, only fill the jug half way in order to prevent the milk froth from spilling out.
- Use a suitably-sized jug for the amount of milk that requires frothing (approx. 200 ml is recommended) and make sure that it is circular and not conical (see the image).

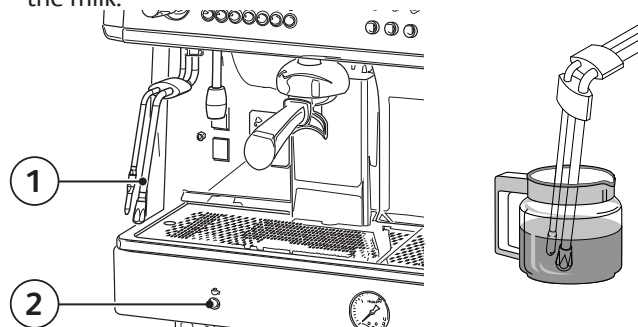


6.11.2 Dispensing



Do not direct the steam towards hands or other parts of the body. Do not touch the steam nozzles with bare hands; use the appropriate PPE.

- Immerse the automatic steam wand nozzle tips (1) into the milk.



- Press the **Autosteamer** button (2).
- Wait until the dispensing process has been completed.
- To stop dispensing ahead of time, press the same button **Autosteamer** again.



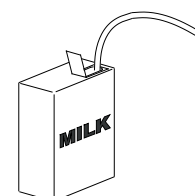
Keep the tips clean at all times using a cloth dampened in lukewarm water. Milk can be kept in the fridge for a maximum of 3-4 days.

6.11.3 Adjusting the temperature

To adjust the activation temperature of the automatic steam wand, follow the instructions provided in paragraph "6.14.11 Programming the Automatic Steam Wand Temperature" on page 44.

6.12 Dispensing cappuccinos

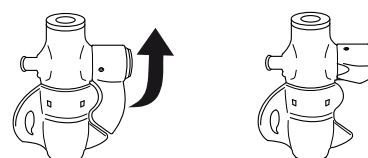
- Put the suction tube in the milk.
- Place the jug under the spout of the cappuccino maker.
- Open the steam valve and when the desired amount has been obtained, close the steam valve.
- Pour the frothed milk into the cups with the coffee.



To obtain hot non-frothed milk, lift the cappuccino maker flap upwards. For better results, we suggest that you do not dispense directly into the coffee cup, but into a jug or pot, and then pour the frothed milk on top the coffee.



Be sure to constantly keep the cappuccino maker clean, by following the instructions provided in paragraph "7.5 Water softener regeneration" on page 51.



6.13 Cup warmer



For safety reasons, we do not recommend placing cloths or other objects on the cup warmer shelf in order to prevent the machine from overheating.



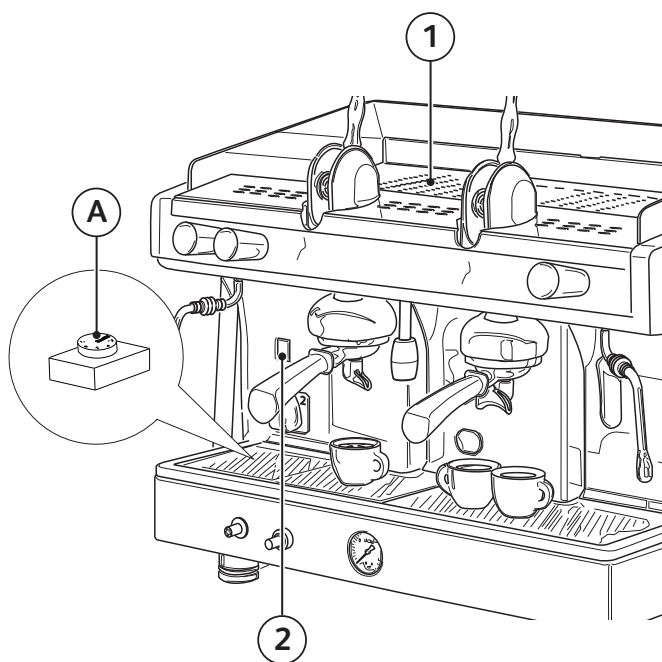
HIGH TEMPERATURE HAZARD: the cup warmer can reach temperatures that may cause burns. Be very careful.

The cup warmer temperature can be set according to personal requirements. The procedure for activating and adjusting the cup warmer according to the model in your possession, is described below.

6.13.1 AL - AEP" versions

To use the cup warmer on this version of the machine, proceed as follows:

- Place the cups on the cup warmer (1) shelf of the coffee machine.
- Turn the cup warmer switch (2) to the ON position.



To adjust the cup warmer temperature, proceed as follows:

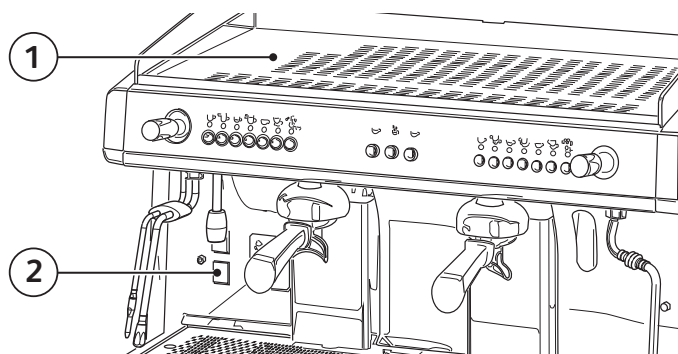
- Remove the cup holder grille and drip tray.
- Turn the thermostat (A) to adjust the temperature or disable the cup warmer. The cup warmer temperature will be proportional to the value indicated on the thermostat.

Thermostat value	Cup warmer adjustment
0	Cup warmer OFF
30	Minimum temperature
60	Average temperature
90	Maximum temperature

6.13.2 "SAE" version

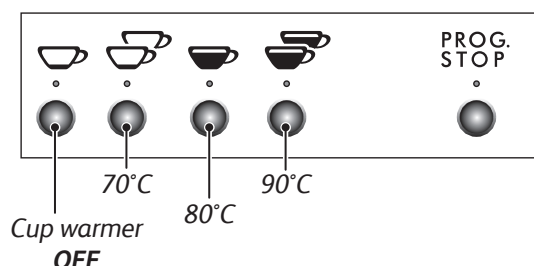
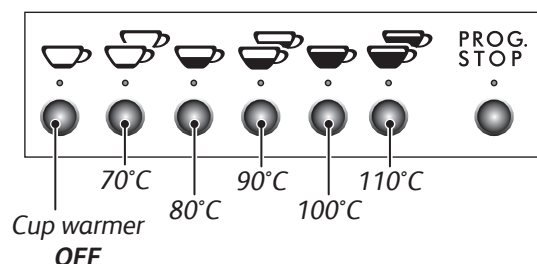
To use the cup warmer on this version of the machine, proceed as follows:

- Place the cups on the cup warmer (1) shelf of the coffee machine.
- Turn the cup warmer switch (2) to the ON position.



To adjust the cup warmer temperature, proceed as follows:

- When the machine is switched on, press the **PROG STOP** button on the right pushbutton panel: the flashing LED will indicate the current cup warmer setting, as indicated in the images.



- Hold down the **PROG STOP** button until the LED on the panel goes from a flashing to a steady light.
- Press the button that corresponds to the desired temperature.
- To confirm the selected value, press the **PROG STOP** button.

6.13.3 "DISPLAY" version

To use the cup warmer on this version of the machine, proceed as follows:

- Place the cups on the cup warmer (1) shelf of the coffee machine.
- Turn the cup warmer switch (2) to the ON position.

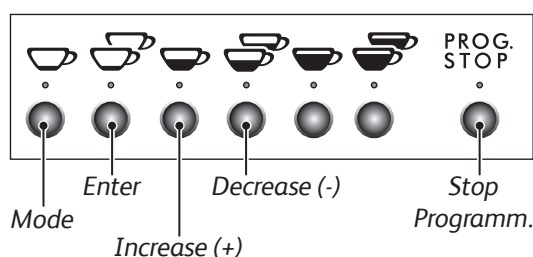
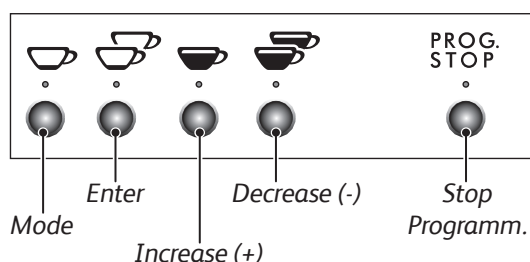


To adjust the cup warmer temperature, follow the instructions provided in paragraph 6.14.

6.14 Programming the “DISPLAY” version machine parameters

6.14.1 Accessing the menu

- To access the programming menu, press and hold the **(MODE)** button for at least 3 seconds.
- Use the **(MODE)** button to scroll the various areas of the programming menu.
- Use the **(ENTER)** button to move from one parameter to another within the same area.
- To change the value of each parameter, use the two (+) increase and (-) decrease buttons.



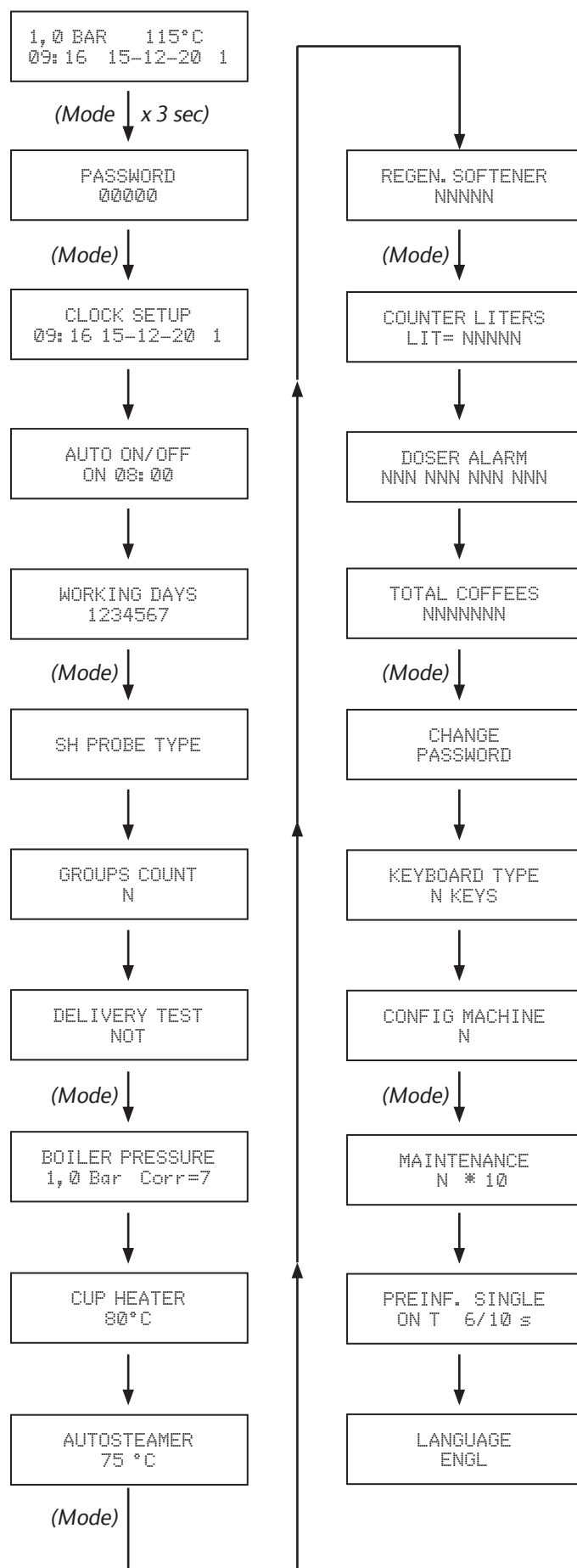
The system automatically exits the programming mode 20 seconds after the last operation was carried out.

Always use the right pushbutton panel for the programming modes.

The machine menu is indicated below.



The machine menu can vary. This occurs should a different version of the software be installed on the machine; sometimes the software is also updated even during maintenance to improve its performance.



6.14.2 Password

By entering the password it is possible to access the complete menu of the technical part:

- Enter programming and view on the display:

PASSWORD
00000

- use the (+) and (-) keys to enter the password 00009 :

PASSWORD
00009

- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.3 Programming the Clock

This menu is used to change the time, date and day of the week:

- Enter the programming mode and scroll through the menu until the following is shown on the display:

CLOCK SETUP
09:16 18-10-12 1

- Change the flashing parameter via the (+) and (-) buttons.
- Press the **(ENTER)** button to move on to the next parameter.
- To confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.4 Programming the machine's Switch-On and Switch-Off function

This menu is used to programme the machine's automatic switch-on and switch-off procedures.

To enable this function, the switch-on time must first be set, before setting the switch-off time.

- Enter the programming mode and scroll through the menu until the following is shown on the display:

AUTO ON/OFF
ON 08:00

- Press the **(ENTER)** button to enter the menu.
- Set the machine's switch-on hour via the (+) and (-) buttons and then press **(ENTER)**.
- Set the minutes of the machine's switch-on time via the (+) and (-) buttons and then press **(ENTER)**.

- The machine start-up settings are saved; you can then proceed to set the switch-off time when the following appears on the display:

AUTO ON/OFF
OFF 23:00

- Set the machine's switch-off hour via the (+) and (-) buttons and then press **(ENTER)**.
- Set the minutes of the machine's switch-off time via the (+) and (-) buttons and then press **(ENTER)**.
- To confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.



To disable the "AUTO ON/OFF" function, set the time to 00:00.

6.14.5 Programming a Working Day

This menu is used to programme the machine's switch-off function for non-operating days.

To set the machine's shutdown days, follow the instructions below.

- Enter the programming mode and scroll through the menu until the following is shown on the display:

WORKING DAYS
1234567

- At this moment, the machine is active seven days a week because all the numbers (which define the relative days) are visible.

Days of the week table

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

- To switch off the machine on a specific day, select the desired day via the (+) and (-) buttons.
- Press the **(ENTER)** button to deactivate the desired working day.
- Then, and only if desired, select another working day and press the **(ENTER)** button to deactivate it.

WORKING DAYS
1-3-567

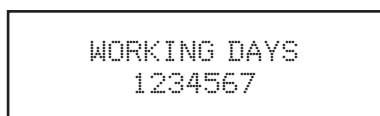
An example of when the machine has been programmed to be switched off on Tuesdays and Thursdays.



On the days of the week in which the machine will be switched off, the "—" symbol appears instead of the relative number.

If you want to reactivate the machine on the previously-deactivated days, proceed as follows:

- Select the deactivated day via the (+) and (-) buttons (where the “-” symbol appears).
- Press the **(ENTER)** button to activate the desired day (the day number will now appear).

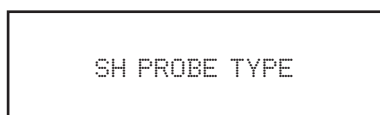


Example of the machine with no non-operating days. Once the programming is complete, press the **(MODE)** button to confirm the entered parameters and move on to the next programming function.

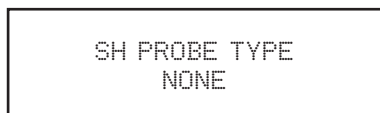
6.14.6 Boiler probe

This menu is used to configure the boiler probe.

- Enter the programming mode and scroll through the menu until the following is shown on the display:



- if the boiler thermoregulation is performed by an external electromechanical pressure switch, using the (+) and (-) keys, set:



- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

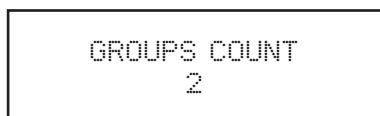
6.14.7 Number of groups

This menu is used to configure the number of groups of the machine.

- Enter the programming mode and scroll through the menu until the following is shown on the display:



- use the (+) and (-) keys to set the number of machine groups:

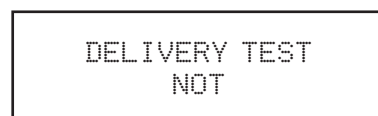


- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.8 Delivery test

This menu is used to activate the dispensing time count.

- Enter the programming mode and scroll through the menu until the following is shown on the display:

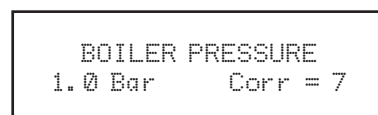


- to enable the counting function, use the (+) and (-) keys ;
- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.9 Programming the Heating Unit Pressure

This menu is used to program the heating unit pressure for dispensing steam.

- Enter the programming mode and scroll through the menu until the following is shown on the display:

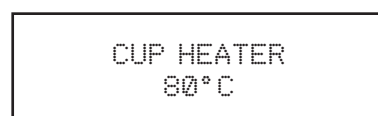


- Set the heating unit pressure (values from 0.9 to 1.2 bar) via the (+) and (-) buttons.
- To confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.10 Programming the Cup Warmer

This menu is used to program the cup warmer temperature and activation.

- Enter the programming mode and scroll through the menu until the following is shown on the display:



- Set the temperature (70-100°C) via the (+) and (-) buttons.
- To confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.



To disable the cup warmer, set a temperature lower than 70°C (---- will appear on the display) or turn the cup warmer switch to OFF.



HIGH TEMPERATURE HAZARD: Please remember that a very high temperature can cause very serious burns.

6.14.11 Programming the Automatic Steam Wand Temperature

This menu is used to programme the automatic steam wand activation temperature:

- Enter the programming mode and scroll through the menu until the following is shown on the display:

AUTOSTEAMER
65°C

- Set the temperature via the (+) and (-) buttons.
- To confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.



The actual temperature of the beverage may differ by a few degrees from the set temperature depending on the amount of the beverage heated.

6.14.12 Regeneration of water softener

Programming of the automatic notice of the need to regenerate the water softener:

- Enter the programming mode and scroll through the menu until the following is shown on the display:

REGEN. SOFTENER
NNNNNN

- Set the quantity of water by means of buttons (+) and (-);
- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.13 Displaying and resetting the litre counter

This menu is used to display the litre counter and reset it:

- Enter the programming mode and scroll through the menu until the litre counter is shown on the display.

COUNTER LITERS
LIT = NNNNN

- Press the (-) button to perform the reset.

RESET COUNTS?
PRESS FOR 3 SECS. +

- Press and hold the (+) button for at least 3 seconds to confirm the reset operation.

LITRES RESET

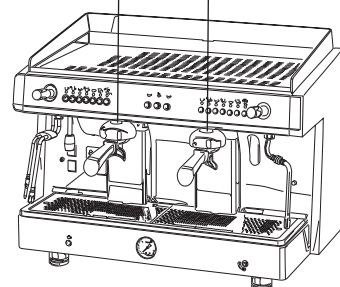
- To confirm and move on to the next programming function, press the **(MODE)** button.

6.14.14 Doser Units alarm

This menu is used to view the alarms of the dispensers and perform the reset:

- Enter the programming mode and scroll through the menu until the following is shown on the display. The following diagram provides the correspondence with the dispensing units:

DOSER ALARM
000 055 070



- to start the zeroing press button (-);

ZEROING COUNTS?
PRESS + 3 SEC.

- to confirm the zeroing press and keep pressed button (+) for 3 seconds;

DOSER ALARM
000 000 000

- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.15 Coffee totals

This menu is used to display the count of the jobs performed by the machine:

- Enter the programming mode and scroll through the menu until the coffee counter is shown on the display.

TOTAL COFFEES
NNNNN

- Press the **(ENTER)** button to enter the menu.
- Repeatedly press the **(ENTER)** button (the LEDs of the various buttons will light up) to view the number of selections performed by the respective button.
- To confirm and move on to the next programming function, press the **(MODE)** button.

To reset the counts of the single dose buttons, proceed as follows:

- Press and hold the **PROG STOP** button on the right-hand push-button panel for at least 5 seconds.

RESET COUNTS?
PRESS FOR 3 SECS. +

- To start the reset operation, press the (-) button.

DATA RESET

- Press and hold the (+) button for at least 3 seconds to confirm the reset operation.



The above-indicated procedure can reset the counts for single selections but not the machine's total counter (machine life cycle).

6.14.16 Change Password

This menu is used to change the password for access to the Technician menu.

- Enter the programming mode and scroll through the menu until the following is shown on the display:

CHANGE
PASSWORD

- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.17 Type keyboards

This menu is used to configure the type of machine keyboard.

- Enter the programming mode and scroll through the menu until the following is shown on the display:

KEYBOARD TYPE
N KEYS

- use the (+) and (-) keys to set the type of keyboard with 5 or 7 keys;
- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.18 Machine configuration

The machine is already configured by the manufacturer. To make any changes, proceed as follows:

- Enter the programming mode and scroll through the menu until the following is shown on the display:

CONFIG MACHINE
N

- using the (+) and (-) keys first set 2 and then configure the machine model by setting the letter as indicated in the table below:

Machine model	
A	Rapallo
B	Sabrina
C	Gloria R12
E	Hollywood

- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.19 Maintenance

This menu is used to set the number of cycles for machine maintenance.

- Enter the programming mode and scroll through the menu until the following is shown on the display:

MAINTENANCE
NNNNN *10

- set the number of cycles using the (+) and (-) keys;
- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

6.14.20 Pre-infusion

This menu is used to set the pre-infusion duration (from 6/10 to 3.2 seconds).

- Enter the programming mode and scroll through the menu until the following is shown on the display:

PREINF. SINGLE
ON T 6/10 s

- set the values using the (+) and (-) keys;
- to confirm the entered parameters and move on to the next programming function, press the **(MODE)** button.

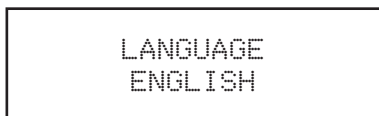


To enable this function, activate switch 3 in the Dip switch (see wiring diagram in par. 13.5).

6.14.21 Programming the Language

This menu is used to programme the language used to display messages on the screen:

- Enter the programming mode and scroll through the menu until the following is shown on the display:



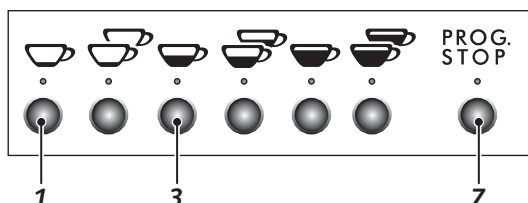
- Set the language via the (+) and (-) buttons.
- To move on to the next programming function, press the (MODE) button.



There is the option to choose between degrees Celsius (°C) and Fahrenheit (°F) for the English language option.

6.14.22 Loading the default data

To restore the factory settings, press and hold the buttons (1), (3) and (7) for 5 seconds when the machine starts up.



6.15 Tips for a good cup of coffee

Wash the filters and filter holders on a daily basis, as indicated in para. 7.7.3 on page 55. The failure to perform this cleaning operation will negatively affect the quality of the dispensed coffee.

To obtain high-quality coffee, it is important that the water hardness does not exceed 6-7°f (French degrees). If the water hardness exceeds these values, it is advisable to use a water filter or softener. Avoid using a water softener if the water hardness is less than 4°f.

If the taste of chlorine in the water is particularly strong, install a special filter.

Do not to keep large amounts of coffee beans on hand. If you change the type of coffee, we recommend calling out the Technician to adjust the water temperature and coffee grinder.

If the machine has not been used for a certain period of time (2-3 hours), carry out a few dry runs. Make sure that the machine is constantly cleaned and periodic maintenance is carried out.

7. MAINTENANCE AND CLEANING

7.1 Safety precautions



Carefully read the instructions provided in chapter "I. SAFETY PRECAUTIONS" on page 3.

7.2 PPE features

When installing the machine, the following PPE is required:



The use of protective gloves is mandatory.

7.3 Maintenance

7.3.1 Scheduled maintenance

Perform the following maintenance according to the specified frequency.

If the machine is used intensively, the checks need to be performed more frequently.

Component	Type of operation	Quarterly	Yearly
PRESSURE GAUGE	Check the heating unit pressure which must be between 0.08 and 0.14 MPa (0.8 and 1.4 bar). Periodically check the water pressure when coffee is being dispensed: check the pressure indicated on the gauge, which must be in the range of 0.8 to 0.9 MPa (8 and 9 bar).	X	
FILTERS AND FILTER HOLDERS	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 the filters and/or filter holders, as required.	X	
DISPENSING GROUP	Replace the shower screen and group gasket as indicated in para. "8.3.3 Dispensing group maintenance" on page 38.	X	
WATER FILTER	Replace the water filter cartridge at the frequency indicated by the manufacturer. If limescale has formed in the hydraulic circuit, the filter will need to be replaced.	X	
WATER SOFTENER	Carry out the regeneration procedure as instructed by the manufacturer. Take care in areas where the water is very hard. The water will need to be regenerated more frequently, especially if the machine is used intensively.	X	
GRINDER-DISPENSER	Check the ground coffee dose (around 7 grams each time) and check the degree of grinding. Grinders must always have sharp cutting edges. Too much powder in the grounds is an indication that the coffee is deteriorating. We recommend contacting the Technician to replace the flat burrs after every 400/500 kg of coffee, or after every 800/900 kg for conical burrs.	X	
HEATING UNIT	Replace the water in the heating unit as indicated in para. 6.7.	X	
HEATING UNIT	Replace the electric heating element if it becomes faulty or malfunctions. Do not replace the heating element with a more powerful one. Before making any changes, please contact the Manufacturer. If the thermostat of the heating element is triggered, reset it by pressing the central button of the thermostat. However, before starting the machine up again, check what caused the problem. If the heating unit insulation needs to be removed, restore the insulation after the maintenance work has been completed. Remove and clean the heating unit level probes. Check for lime scale deposits on the heating element, on the exchanger (inside and out). If there is a lot of limestone build-up, this 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 negative pressure valves are operating properly, as indicated in para. 7.3.4 - 7.3.5 - 7.3.6. If these need to be replaced due to malfunction, repeat the check with the newly-installed valve.		X
HYDRAULIC CIRCUIT	Check whether there is any lime-scale build-up in the hydraulic circuit. When replacing any components, always replace the relative gasket as well. If there is a lot of limestone build-up in the machine's hydraulic circuit, this indicates that the water filter has not been replaced, or that the softener has not been regenerated. Take care in areas where the water is very hard. The water filter will need to be replaced more frequently and the water softener will need to be regenerated more often, especially if the machine is used intensively.		X
DRAIN	Check for any leaks on the water mains and sewer connections. Check the condition of the drain tray and the drain connection tube.		X
DISPENSING GROUP	Check the efficiency of the dispensing group's solenoid valve.		X
GAS SYSTEM	Check for any gas leaks with a suitable gas detection instrument, or by wiping a soapy solution over all the gas system fittings.		X
WATER and STEAM NOZZLES	Check the condition of the nozzles and clean the sprayer.		X
DOSING DEVICE	Check and clean the volumetric dosing device by removing any oxidation from the tips.		X

Component	Type of operation	Quarterly	Yearly
PRESSURE GAUGE AND PRESSURE SWITCH	Check that the dosing device and pressure switch are working properly.		X
VOLUMETRIC DOSING DEVICE	Check and clean the volumetric dosing device by removing any oxidation from the tips.		X
MOTOR PUMP	Visually inspect the condition of the machine's wires.		X



If any work is carried out on the machine electronics when the machine is still live, any guarantee will automatically be invalidated.



All original spare parts are available from the Manufacturer's website. The Manufacturer may provide the list of spare parts recommended for the maintaining the various versions of the machine.

7.3.2 Maintenance after a short period of machine inactivity

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

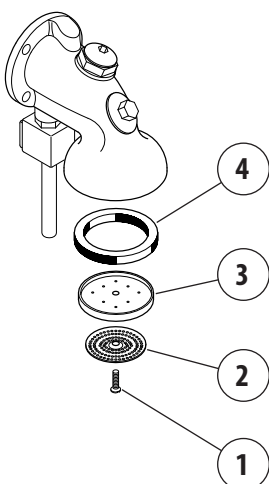
If the machine is switched back on after this period, all the water inside the hydraulic circuits must be replaced as indicated in para. 6.7.

Furthermore, all periodic maintenance operations must be carried out, see the previous paragraph.

7.3.3 Dispensing group maintenance

Replace the dispensing group's shower screen (2) and group gasket (4) on a quarterly basis (we recommend only using original spare parts), by proceeding as follows:

- Unscrew the screw (1).
- Remove the shower screen containment ring (3).
- Replace the group shower screen (2) and the rubber group gasket (4).
- Reassemble the components.



7.3.4 SAFETY VALVE check

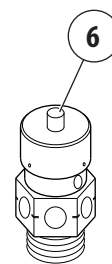
The pressure relief valve is one of the main components for machine safety. Therefore, it is important to carry out the following checks:

First check:

- Remove the machine's upper grille.
- Use pliers to pull the valve pin (6) upwards.
- If the pin will not budge, it probably means that the valve is encrusted with limestone and must be replaced.

Second check:

- Turn the machine off.
- Close off the pressure switch contacts.
- Turn the machine back on and wait for the pressure in the heating unit to rise.
- Check that the valve is working correctly at the maximum pressure of 0.19 bar (1.9 bar).



If any malfunctions are detected, the valve must be replaced. Only use the Manufacturer's original Safety Valves.

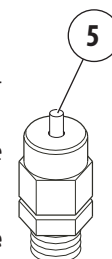
7.3.5 NEGATIVE PRESSURE VALVE check

First check:

- Remove the machine's upper grille.
- Use pliers to push the valve pin (5) downwards.
- If the pin will not budge, it probably means that the valve is encrusted with limestone and must be replaced.

Second check:

- Turn the machine off.
- Open the steam valves and release all the pressure from inside the heating unit.
- Turn the machine back on and check that the valve is closing normally.

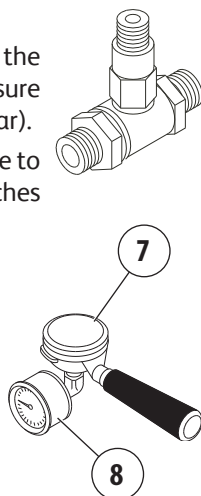


If any malfunctions are detected, the valve must be replaced.

7.3.6 NON-RETURN DRAIN VALVE check

The non-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 pressure 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 0.8-0.9 MPa (8-9 bar).
- Check that the pressure is increasing due to the heated water expanding until it reaches approximately 1.2 MPa (12 bar): when this value is reached, it confirms that the valve is working correctly and the seals and solenoid valves are tight.
- Stop dispensing.
- Repeat the check on the other dispensing groups.



If any malfunctions are detected, the valve must be replaced.

7.4 Water filter maintenance

7.4.1 Determining the water hardness

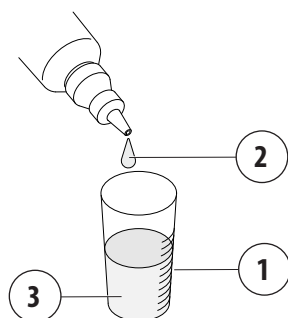
As part of the filter maintenance, it is advisable to test the water beforehand.

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

- Put 10 ml of water to be tested (1) in the test tube.
- Add a drop of reagent (2) and mix.
- Proceed in the same way by counting the number of drops until the solution (3) turns from blue to red.

1 DROP = 1°dKH

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



7.4.2 Bypass configuration

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

9°dKH water hardness

Bypass adjustment 2

Water hardness (°dKH)	Bypass Adjust.	Filter capacity (litres)			
		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



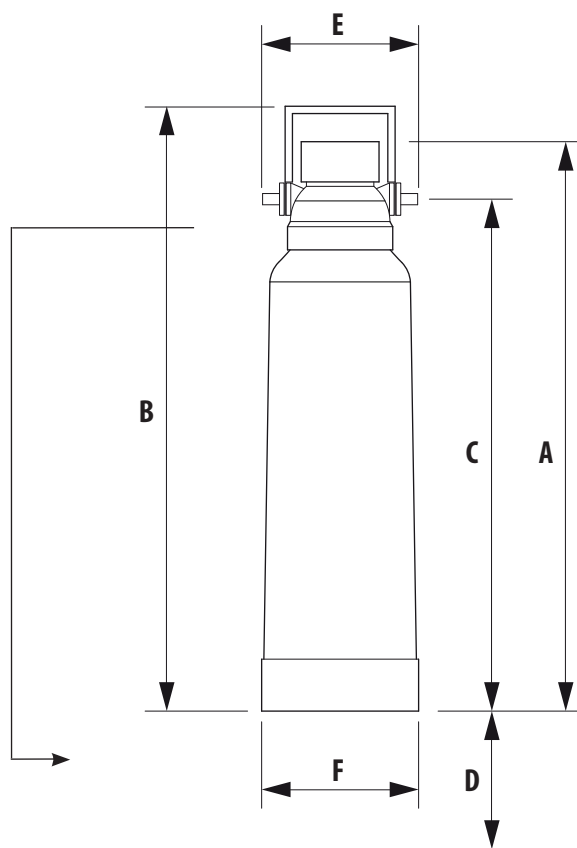
The values indicated in the table may vary, depending on the type of filter cartridge used.

To adjust the bypass, push the (4) button and turn.



7.4.3 Technical data

Model	V	M	L	XL
Connection type	3/8"	3/8"	3/8"	3/8"
Min.-max. water supply pressure (bar)	2-8	2-8	2-8	2-8
Min. - max. water temperature (°C)	4-30	4-30	4-30	4-30
Room 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	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.



To use and maintain the water filter, follow the indications by the manufacturer.

7.5 Water softener regeneration

It is very important to regenerate the softener within the established times. The regeneration is to be carried out regularly: every 15 days. However, in locations where the water is very hard, it will be need to be regenerated more frequently. The same rule can be applied to locations where there is a large consumption of hot water (for tea, etc.).

Proceed as follows:

- Move the lever (B) and (E) from left to right.
- Remove the lid by unscrewing the knob (A).
- Release enough water through the pipe (C) to make room for the amount of salt required depending on the model (see table).
- Clean any salt or resin residues from the gasket located on the lid.
- Put the cover back on by securely screwing the knob (A) 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.

i **The build-up of limescale in the hydraulic circuit and heating unit inhibits thermal exchange, which prevents the machine from working properly. Heavy incrustations in the heating unit may cause long machine shutdowns and in any case invalidate any guarantee, because this symptom indicates that the regeneration procedure has not been carried out.**

In order to keep the water softener, and hence the machine, in perfect operating condition, it is necessary to regularly regenerate it, depending on 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 measurement:

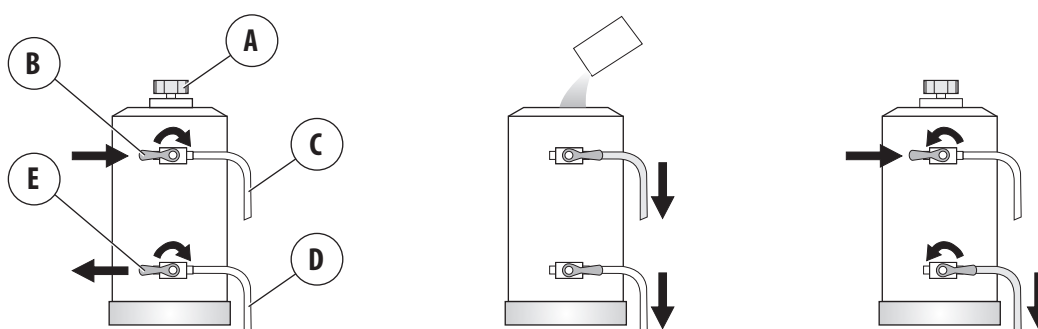
- °f: French degree
- °d: German degree = 1.8°f
- mg CaCO₃

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 L	900 L	700 L	500 L	1.0 kg
12 litres	1500 L	1350 L	1050 L	750 L	1.5 kg
16 litres	2100 L	1800 L	1400 L	1000 L	2.0 kg

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

i **To use and regenerate the water softener, follow the instructions provided by the manufacturer.**



7.6 Malfunctions and solutions

Problem	Cause	Action
NO MACHINE POWER	<ul style="list-style-type: none"> The general switch is in the "OFF" position. The machine switch is faulty. The mains 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. Turn the mains switch to the ON position. Check for any faulty connections.
NO WATER IN THE HEATING UNIT	<ul style="list-style-type: none"> The water mains valve is shut off. The cut-off valve 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 faulty. The water inlet solenoid valve filter is clogged. 	<ul style="list-style-type: none"> Open the water mains valve. Open the automatic level device valve. Replace the pump filter. Check the motor pump. Replace the water filling solenoid valve. Clean or replace the solenoid valve filter.
TOO MUCH WATER IN THE HEATING UNIT	<ul style="list-style-type: none"> The solenoid valve of the automatic level device is faulty. 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 tray is not draining. The drain pipe is broken, has detached, or the water flow is obstructed. Water is leaking from the hydraulic circuit. 	<ul style="list-style-type: none"> Check the sewer drain. Check and restore the drain pipe connection to the tray. 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"> The group gasket is worn. 	<ul style="list-style-type: none"> Replace the group gasket.
THE GAUGE INDICATES A NON-CONFORMING PRESSURE	<ul style="list-style-type: none"> The pressure gauge is faulty. The pressure switch has been calibrated incorrectly. The motor pump has been calibrated incorrectly. 	<ul style="list-style-type: none"> Replace the pressure gauge. Adjust the pressure switch calibration. Adjust the motor pump calibration.
THE SAFETY VALVE HAS CUT-IN	<ul style="list-style-type: none"> The pressure transducer is broken. The electronic control unit is faulty. 	<ul style="list-style-type: none"> Check for correct operation of the pressure transducer. Replace the safety valve with an original spare part only. Check that the electronic system is working properly.
STEAM DOES NOT COME OUT OF THE NOZZLES	<ul style="list-style-type: none"> The machine is switched off. The electrical heating element is faulty. The temperature probe is faulty. The nozzle sprayer is clogged. The safety thermostat is deactivated or faulty. 	<ul style="list-style-type: none"> Turn on the machine. Replace the electrical heating element. Replace the temperature probe. Clean the steam nozzle sprayer. Reactivate the thermostat or replace it.
WATER OR STEAM MIXED WITH WATER COMES OUT OF THE STEAM NOZZLES	<ul style="list-style-type: none"> The level of the heating unit is too high due to the level probe being incorrectly positioned inside the heating unit or the presence of limestone. The heating unit filling solenoid valve is leaking. 	<ul style="list-style-type: none"> Check the condition 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 IS DISPENSING	<ul style="list-style-type: none"> There is no water in the mains. 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 jammed. The inlet and outlet valves of the dosing device 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 valves.

Problem	Cause	Action
THE COFFEE GROUNDS ARE WET	<ul style="list-style-type: none"> The group solenoid valve drain is clogged. The dispensing group is too cold. The coffee has been ground too finely. There's not enough ground coffee. 	<ul style="list-style-type: none"> Clean the group drain. Wait until the group has fully heated up. Adjust the coffee grinder. Increase the amount of ground coffee.
GROUND FOUND IN CUPS	<ul style="list-style-type: none"> The filter holder is dirty. The filter holes are worn. The coffee has not been ground evenly. The group gasket is worn. The pump pressure is too high. 	<ul style="list-style-type: none"> Clean the filter holder. Replace the filter. Replace the grinders. Replace the seal. Adjust the pump pressure.
THE CUP IS DIRTY WITH SPLASHES OF COFFEE	<ul style="list-style-type: none"> There are steam pockets in the dispensing system. There are air pockets in the hydraulic circuit. The coffee has been ground too coarsely. 	<ul style="list-style-type: none"> Reduce the water temperature. Check the cause and resolve the problem. Adjust the grinder as appropriate.
THE COFFEE IS TOO COLD	<ul style="list-style-type: none"> The heating element of the coffee heating unit is faulty. The wiring is faulty. There is limescale on the exchangers and/or heating element. The pressure switch contacts are oxidised. The heating element protection thermostat has cut-in. 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 electrical heating element. Check for any faulty connections. Clean the machine. Clean the contacts or replace the pressure switch. Reset the safety heating element. Turn the machine switch to position "2". Clean the exchanger connections, and clean or replace the two circulation pipes. 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 softener's water valve. Perform a dry dispensing run for a few minutes. Reconnect the pump to the power supply. Open the softener's water outlet valve. Dispense until water comes out. Wait a few minutes for it to heat up.
THE COFFEE IS TOO HOT	<ul style="list-style-type: none"> The heating unit temperature is too high. The group's flow reducer is not suitable. 	<ul style="list-style-type: none"> Reduce the pressure in the heating unit 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"> The coffee has been ground too coarsely. The diameter of the injector is too big. The dose of ground coffee is too small. 	<ul style="list-style-type: none"> Adjust the coffee grinder. Replace the injector with one that has a smaller diameter. Check the amount (grams) of ground coffee being used.
COFFEE IS BEING DISPENSED TOO SLOWLY	<ul style="list-style-type: none"> The coffee has been 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 coffee grinder. Replace the injector. Check and clean the dispensing group. Clean and replace the filters, if necessary.
SAE version: THE ELECTRONIC SYSTEM HAS SHUTDOWN	<ul style="list-style-type: none"> The control unit main fuse has burned out. One of the volumetric dosing device's contacts is grounded. 	<ul style="list-style-type: none"> Replace the main fuse (125 mA). Check the volumetric dosing device connection.
SAE version: COFFEE IS ONLY DISPENSING VIA THE MANUAL BUTTON	<ul style="list-style-type: none"> The control unit fuse is burned out. The solenoid valve coil is malfunctioning or has shorted. 	<ul style="list-style-type: none"> Replace the control unit fuse (1A). Replace the coil of the solenoid valve.

Problem	Cause	Action
<p>SAE version:</p> <p>COFFEE IS BEING DISPENSED INCORRECTLY</p> <p>THE COFFEE DOSE IS NOT CORRECT</p> <p>THE DOSE BUTTON LED IS FLASHING</p>	<ul style="list-style-type: none"> The volumetric dosing device connection is faulty. The electronic control unit connection is faulty. The volumetric dosing device connector is wet. The volumetric dosing device is faulty: the LED does not flash during the dispensing process. The coffee has been ground too finely: there isn't enough water flow in the dosing device. The non-return valve is losing pressure (the dose is too small). The expansion valves are losing pressure (the dose is too small). Water is leaking from the group solenoid valve when coffee is being dispensed or when in standby. The volumetric dosing device is partially obstructed. 	<ul style="list-style-type: none"> Check that the volumetric dosing device connector has been connected properly. Check that the connector (8/10 poles) has been connected correctly to the electronic control unit. Remove the volumetric dosing device connector and thoroughly dry the contacts. Replace the heads of the volumetric dosing device or replace the whole dosing device. Suitably adjust the grind 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>THE LEDS OF ALL THE PUSHBUTTON PANELS ARE FLASHING</p> <p>AEP version:</p> <p>THE FRONT LED IS FLASHING</p>	<ul style="list-style-type: none"> The water stops being automatically filled after a few minutes. The timeout device has cut in. There is no water in the mains. The automatic level device valve 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 mains valve. Open the automatic level device valve. Check and replace the faulty hoses. Check and restore the connections.
<p>UNEVEN AMOUNTS OF MILK ARE DISPENSING FROM THE CAPPUCCINO MAKER</p>	<ul style="list-style-type: none"> The milk has run out. The milk injector is clogged. The cappuccino maker is clogged. The suction hose is clogged. The silicone tube is detached. 	<ul style="list-style-type: none"> Refill the milk. Clean the milk injector. Clean the cappuccino maker with the brush. Clean the milk suction hose. Connect the hose correctly.
<p>THERE ARE AIR POCKETS IN THE MILK FROTH FROM THE CAPPUCCINO MAKER</p>	<ul style="list-style-type: none"> The air regulator is open too much. The air suction hose is disconnected from the cappuccino maker. 	<ul style="list-style-type: none"> Properly calibrate the air regulator. Restore the connection via 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 IS BEING DISPENSED INCORRECTLY</p> <p>THE COFFEE DOSE IS NOT CORRECT</p>	<ul style="list-style-type: none"> The volumetric dosing device connection is faulty. The electronic control unit connection is faulty. The volumetric dosing device connector is wet. The volumetric dosing device is faulty: during dispensing the dosing device LED does not flash. The coffee has been ground too finely: not enough water is flowing into 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 that the volumetric dosing device connector has been connected properly. Check for proper connection of the electronic control unit connector. Remove the volumetric dosing device connector and thoroughly dry the contacts. Replace the heads of the volumetric dosing device or replace the whole dosing device. Suitably adjust the grind and check the grinders, if necessary. Clean and replace the solenoid valve, if necessary. Clean or replace the volumetric dosing device.
<p>BUBBLES IN THE MILK FROTH</p>	<ul style="list-style-type: none"> The air regulator is open too much. The air suction hose is disconnected from the cappuccino maker. The frothed milk is too hot. 	<ul style="list-style-type: none"> Properly calibrate the air regulator. Restore the connection via the hose. Reduce the temperature of the frothed milk, increase the speed of the milk pump.

7.7 Cleaning operations

7.7.1 General instructions

A few simple cleaning tasks are required to have a perfectly sanitised and efficient appliance. The instructions provided here apply when the machine is being used on a regular basis. If the machine is used consistently, cleaning should be performed more frequently.



Do not use alkaline cleaners, solvents, alcohol or aggressive substance-based products (e.g. phosphoric, citric or sulfamic acids). The products/cleaners used must be suitable for this purpose and not corrode the water circuit elements.

Do not use abrasive cleaners which may scratch the body's surface.

Always use clean and sanitised cloths when cleaning.

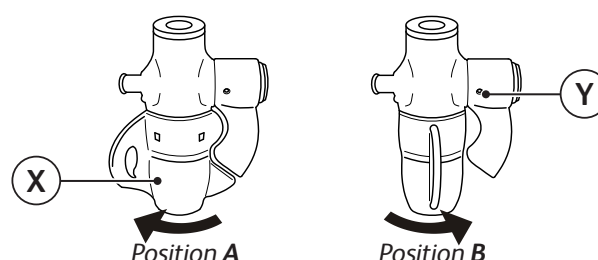
When washing the filters, filter holders and all machine components, use Manufacturer-supplied cleaners or products specific for cleaning professional coffee machines.

Cleaning	Daily	Weekly
Cappuccino maker: Clean the cappuccino maker at least once a day or more often if it is used constantly, by following the instructions in para. 7.7.2 on page 55.	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	
Filters and Filter Holders: Wash the filters and filter holders on a daily and weekly basis, as indicated in para. 7.7.3 on page 55. Perform the cleaning operations on a daily basis as indicated in para. 7.7.5.	X	X
Steam nozzle: Keep the nozzle clean at all times using a cloth dampened in lukewarm water. Check and clean the nozzle tips, by clearing the steam outlet holes with a small needle. Wash these on a weekly basis, as indicated in para. 7.7.6 on page 57.	X	X
Dispensing group: Wash the dispensing group as described in para. 7.7.4 Perform the cleaning operations on a daily basis as indicated in para. 7.7.5. Internally clean the group on a weekly basis, as indicated in para. 7.7.5 on page 57.	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

7.7.2 Washing the cappuccino maker

Take special care when cleaning the cappuccino maker and follow the steps provided below:

- Perform an initial wash by immersing the suction hose into the water and dispensing for a few seconds.
- Turn the rotating body (X) 90° to position B (the milk outlet duct closes).
- Whilst holding the milk suction hose in the air, dispense steam (cappuccino maker dry run).
- Wait around 20 seconds so that the cappuccino maker can be internally cleaned and sterilised.
- Shut off the steam and put the rotating body back into position A.
- If the air intake hole (Y) is blocked, clear it gently using a pin.



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

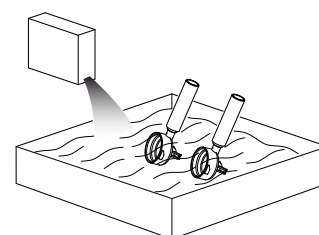
7.7.3 Cleaning the filters and filter holders



Caution: only immerse the filter holder cup in water and try not to get the handle wet. The cleaner must be diluted in cold water in the doses indicated on the package (see the manufacturer).

Daily:

- Soak the filter and filter holder in hot water overnight so that the fatty coffee deposits can dissolve.
- Rinse everything in cold water.



Weekly:

- Use a screwdriver to detach the filter from the filter holder.
- Soak the filter and filter holder in warm water with a suitable cleaner for 10 minutes.
- Rinse everything in cold water.

7.7.4 Washing the dispensing group



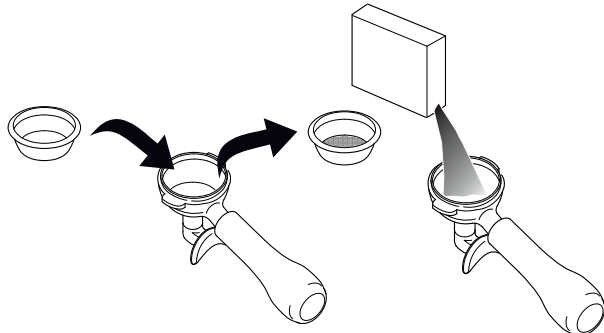
Those in possession of the “AL” version of the machine, must not perform the group wash operation.

Wash the dispensing groups on a daily basis.

The coffee dispensing wash method is different for each machine type. The instructions specific to the model being used must be followed.

In any case, before starting the wash operation, the filter holder must be prepared as described below:

- Remove the filter from the filter holder and fit a blind filter (see the standard supplied parts);



- pour the specific cleaner into the filter holder with the blind filter and hook it to the dispensing group.

From here on, follow the instructions specific to your machine.

“AEP” version

- Carry out several dispensing cycles until the water comes out clean;
- remove the filter holder from the group and carry out at least one dispensing cycle in order to eliminate any cleaner residues;
- remove the blind filter from the filter holder and replace it with the original one.

“SAE” version



The washing operations can also be carried out simultaneously on multiple dispensing groups. To exit the washing phase, the washing procedure must have been completed on all groups.

If there is a power failure during the wash or rinse cycle, when the machine turns back on, the (2) ☕ button’s LED will flash to indicate that the wash cycle was interrupted.

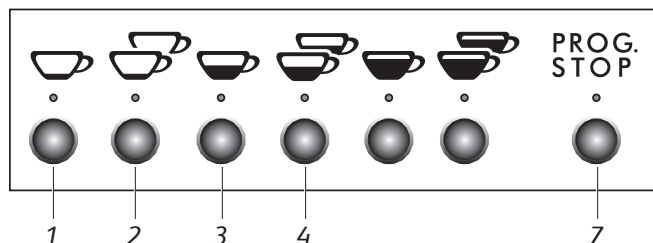
The operation will need to be performed again to remove any detergent remaining in the group.

- Press and hold the (7) ^{PROG.}_{STOP} button on the keypad of the group you would like to wash and immediately afterwards, press and hold the (2) ☕ button for at least 10 seconds (the button should flash);
- to start the wash cycle, press the (2) ☕ button again (the (1) ☕ and (2) ☕ buttons should flash);

- wait for the 5 automatic rinse cycle to completely finish (this takes roughly 30 seconds);
- when the (2) ☕ button flashes to indicate that the wash cycle has been completed, remove both the filter holder and blind filter, then replace the coffee filter in the filter holder;
- reattach the filter holder to the dispensing group and press the (2) ☕ button to start the rinse cycle;
- wait whilst the automatic rinse cycle is being performed (roughly 30 seconds); this is indicated by the (3) ☕ and (4) ☕ buttons flashing;
- all of the buttons will light up to indicate that the rinse cycle has finished;
- repeat the same operations for the other groups.



If using the version with an automatic steam wand, the (7) ^{PROG.}_{STOP} button can be used on any keypad. Use the (2) ☕ button on the keypad of the group you would like to wash.



“SAE-DISPLAY” version






Multiple groups can be washed at the same time; each keypad controls the reference group. If there is a power failure during the wash or rinse cycle, when the machine turns back on, it will prompt for the group wash cycle to be performed again. The operation will need to be performed again to remove any detergent remaining in the group.

- Press and hold the (7) ^{PROG.}_{STOP} button on the keypad of the group you would like to wash and immediately afterwards, press and hold the (2) ☕ button for at least 10 seconds (the button should flash);
- to start the wash cycle, press the (2) ☕ button again (the (1) ☕ and (2) ☕ buttons should flash) and the following message will appear on the versions with a display:



- wait for the 5 automatic rinse cycle to completely finish (this takes roughly 30 seconds);
- when the (2) ☕ button flashes to indicate that the wash cycle has been completed, remove both the filter holder and blind filter, then replace the coffee filter in the filter holder;

- reattach the filter holder to the dispensing group and press the **(2)**  button to start the rinse cycle;
- wait for the automatic rinse cycle to completely finish (this takes roughly 30 seconds) (buttons **(3)**  and **(4)**  flash) and the following message will appear on the versions with a display:



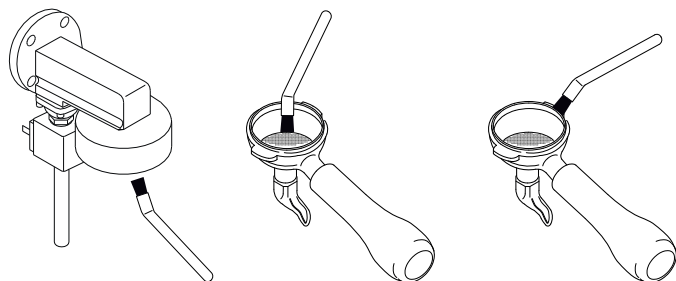
- at the end of the rinse cycle, the machine is ready for normal use.

7.7.5 *Cleaning the group shower screen, shower screen containment ring and filter holder*

Daily

Clean the dispensing group and filter holder shower screens with the supplied brush on a daily basis.

Thoroughly clean the inside of the coupling ring and filter holder, as well as the edge and the wings of the filter holder, so as to eliminate any accumulated coffee residues.

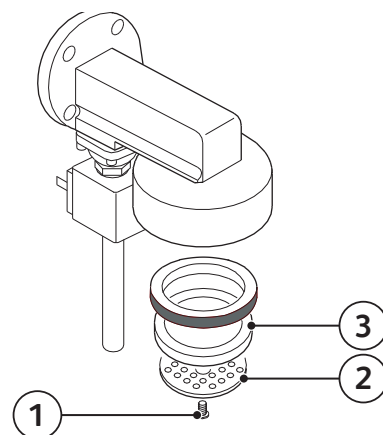


Use the special toothbrush supplied (see the Spare Parts Catalogue).

Weekly

Clean the shower screen and shower screen containment ring as follows:

- Loosen the screw using a screwdriver **(1)**;
- remove the shower screen **(2)** and the shower screen containment ring **(3)**;
- wash the two components with hot water;
- reposition the shower screen and shower screen containment ring in their original position and lock everything in place with the screw.



7.7.6 *Cleaning the steam nozzle*

Weekly

Clean the steam nozzle as follows:

- Insert the nozzle into a jug with water and a specific cleaner, in accordance with the manufacturer's instructions;



- heat the solution with the steam nozzle;
- let the nozzle cool down whilst keeping it immersed in the solution for at least 5 minutes, so that cleaner can rise inside the nozzle due to the cooling effect;
- repeat the operation 2 or 3 times until no more milk residue is dispensed.

8. DISPLAY WARNINGS

DISPLAY WARNINGS	ALARM	TYPE	CAUSE	SOLUTION
DOSER ALARM	Volumetric electronic control	Non-blocking	Volumetric electronic control fault	Check the connection and replace the volumetric dispenser if necessary
GRINDING ERROR	External grinder	Non-blocking		
MAINTENANCE	Maintenance	Non-blocking	Request for maintenance	Carry out maintenance
REG. WATER SOFTENER	Water softener regeneration	Non-blocking	Water softener regeneration prompt	Carry out the water softener regeneration.
BOILER SENSOR	Boiler temperature sensor	Non-blocking	Anomaly of the boiler temperature sensor	Check the connection and replace the boiler sensor if necessary
CUP WARMER SENSOR	Cup warmer sensor	Non-blocking	Anomaly of the cup warmer temperature sensor	Check the connection and replace the cup warmer probe if necessary
STEAM SENSOR	Autosteamer Sensor	Non-blocking	Autosteamer temperature sensor fault	Check the connection and replace the Autosteamer probe if necessary
FILLING TIMEOUT	Boiler filling timeout	Blocking	Filling with water in the boiler when using the machine for the first time or to restore the level.	Wait for the boiler to fill up.
HEATING TIMEOUT	Boiler heating timeout	Blocking	Water heating in the boiler too slow or not active.	Check the connection and replace the boiler resistance if necessary.

9. SPARE PARTS

To replace machine components and/or parts, refer to the official documentation provided by the Manufacturer.



All original spare parts are available from the Manufacturer's website. The Manufacturer can provide a list of spare parts recommended for maintaining the various versions of the machine on request.



If non-original parts are used, the safety of the machine cannot be guaranteed. The Manufacturer reserves the right to void the machine guarantee.

10. DECOMMISSIONING

10.1 Short period of machine inactivity

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

If the machine is reactivated after this period, the Technician must replace all the water contained in the hydraulic circuits as indicated in para. "6.6 Water replacement" on page 49.

All the scheduled maintenance operations must also be performed - see para. "10.3.1 Scheduled maintenance" on page 49.

10.2 Long period of machine inactivity

"Long period of machine inactivity" refers to a period of time exceeding 30 working days.

In this case, the machine must be disconnected from the electric, hydraulic and gas mains if fitted, and all the internal circuits must be drained of water.

To connect the machine after this period, follow the initial installation procedure.

11. DISASSEMBLY

To disassemble the machine, follow the installation procedure in reverse order - see chap. "5. INSTALLATION" on page 23. All dismantled components must be divided by material to make identification easier and then disposed of at the authorised collection centres, as instructed in chap. "12. DISPOSAL" on page 60.

12. DISPOSAL

12.1 Disposal information

For the European Union and the European Economic Area only.



This symbol indicates that the product cannot be disposed of with household waste, pursuant 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 product with similar features, or an authorised collection site that recycles electrical and electronic equipment waste (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 the potentially hazardous substances which are usually found in this kind of waste.

Your cooperation in correctly disposing of this product will contribute to the effective use of natural resources and you will avoid incurring fines provided by law. For more information about recycling this product, contact either your local authority, the entity responsible for waste collection, an authorised dealer or your household waste disposal service.



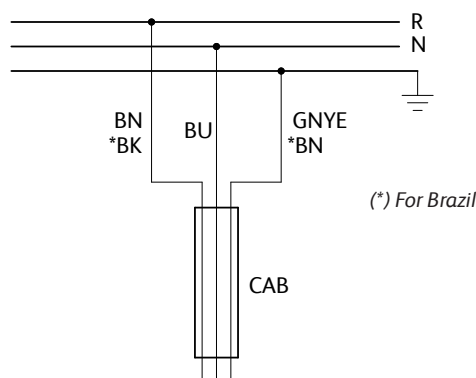
Before disposing of the machine, we recommend seeking advice from the Technician and/or the seller.

12.2 Environmental information

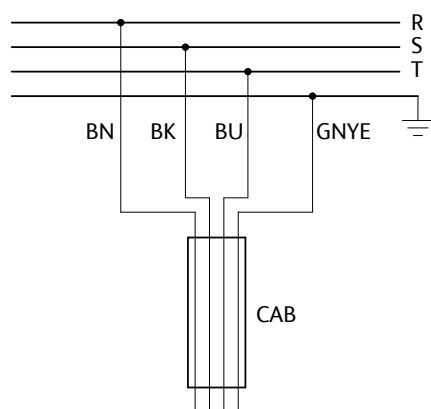
The machine features an internal lithium button battery, which is located in the circuit board and ensures data storage. Dispose of the battery in accordance with current national regulations.

13. WIRING DIAGRAMS

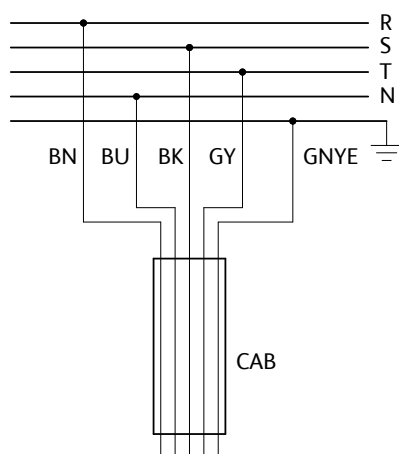
13.1 ELECTRIC MAINS connection



3-CONDUCTOR CABLE (Phase+Neutral+Earth)



4-CONDUCTOR CABLE (3 Phase+Earth)



5-CONDUCTOR CABLE (3 Phase+Neutral+Earth)

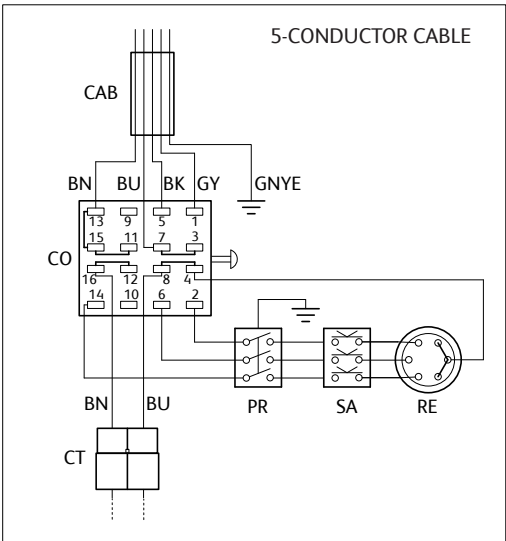
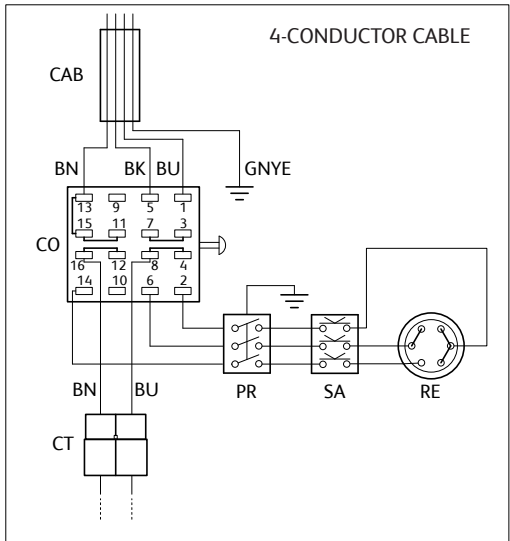
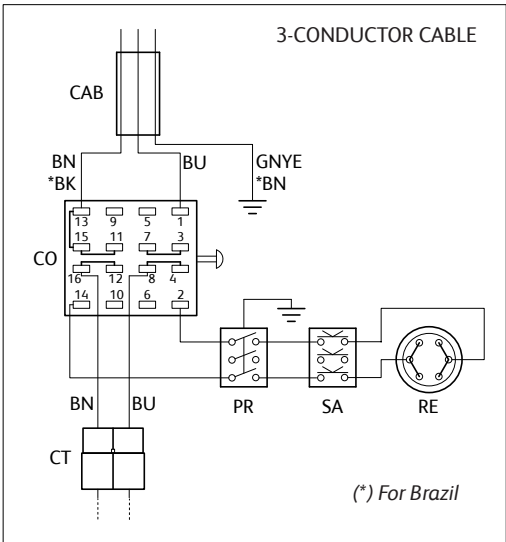
R	Phase
S	Phase
T	Phase
N	Neutral
	Earth
BU	Blue
CAB	Power cable
GY	Grey
GNYE	Yellow-green
BN	Brown
BK	Black



To correctly connect the machine to the electric mains, please refer to the information provided on the nameplate (see the example in paragraph 2.7).

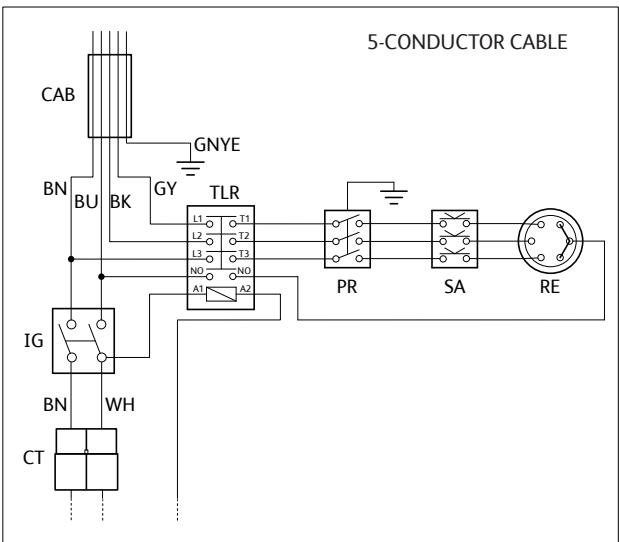
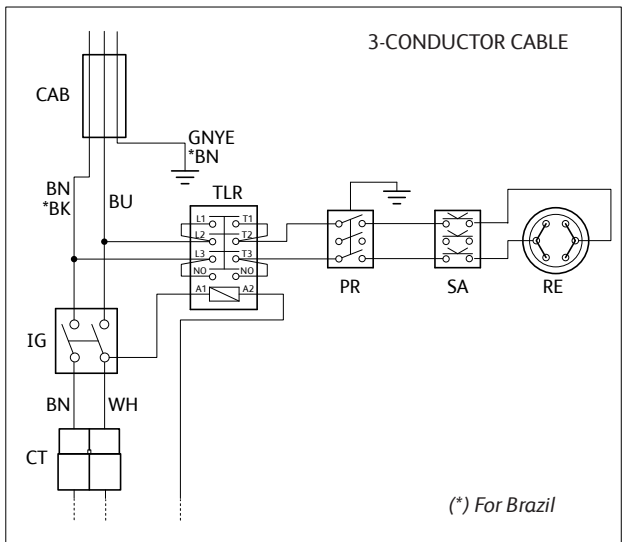
13.2 MACHINE Power Supply

13.2.1 AL-AEP-SAE version

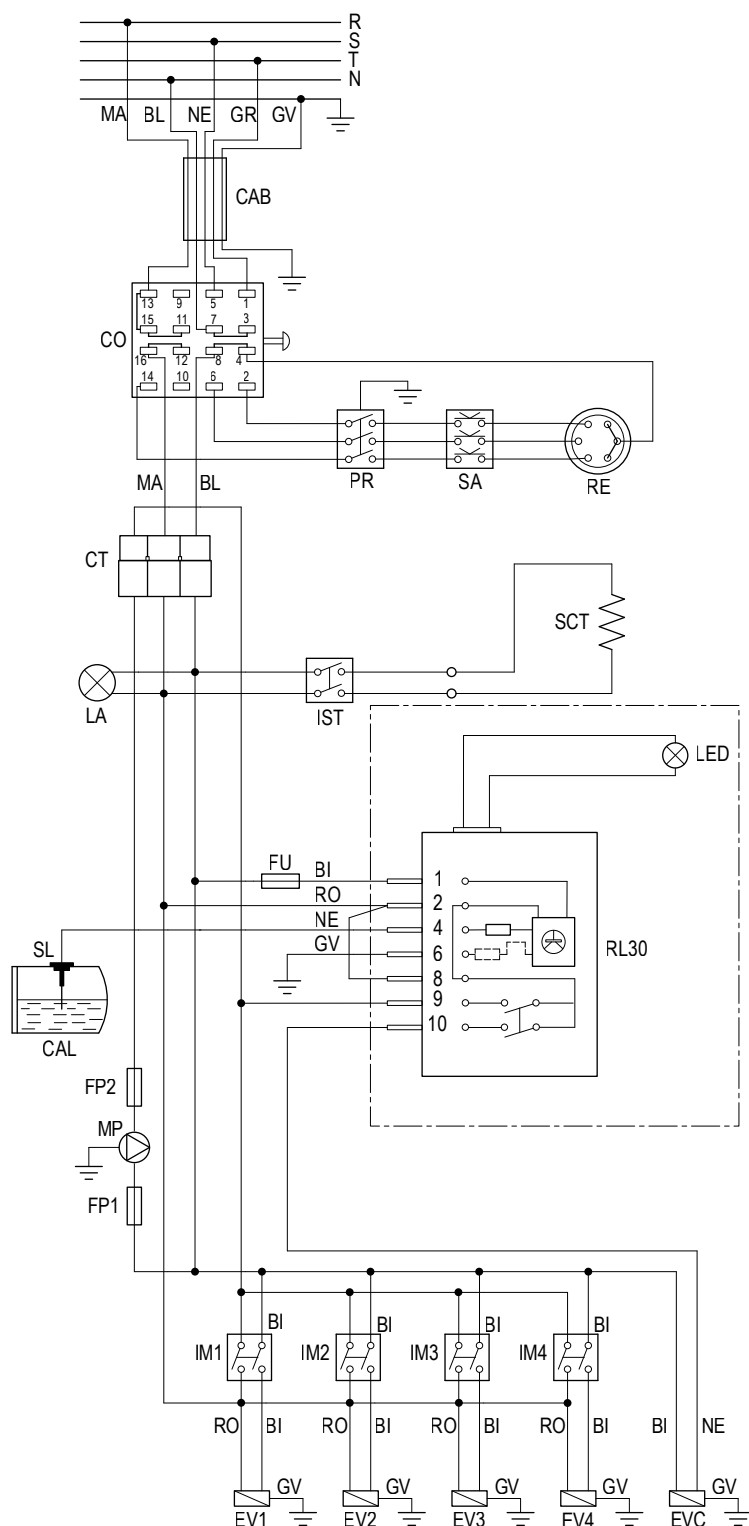


R	Phase
S	Phase
T	Phase
N	Neutral
	Earth
BU	Blue
CAB	Power cable
CO	Power switch
CT	Connector
GY	Grey
GNYE	Yellow-green
IG	Switch
BN	Brown
BK	Black
PR	Pressure switch
RE	Heating element
SA	Safety heating el.
TLR	Remote switch
WH	White

13.2.2 DISPLAY version



13.4 AEP version



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

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

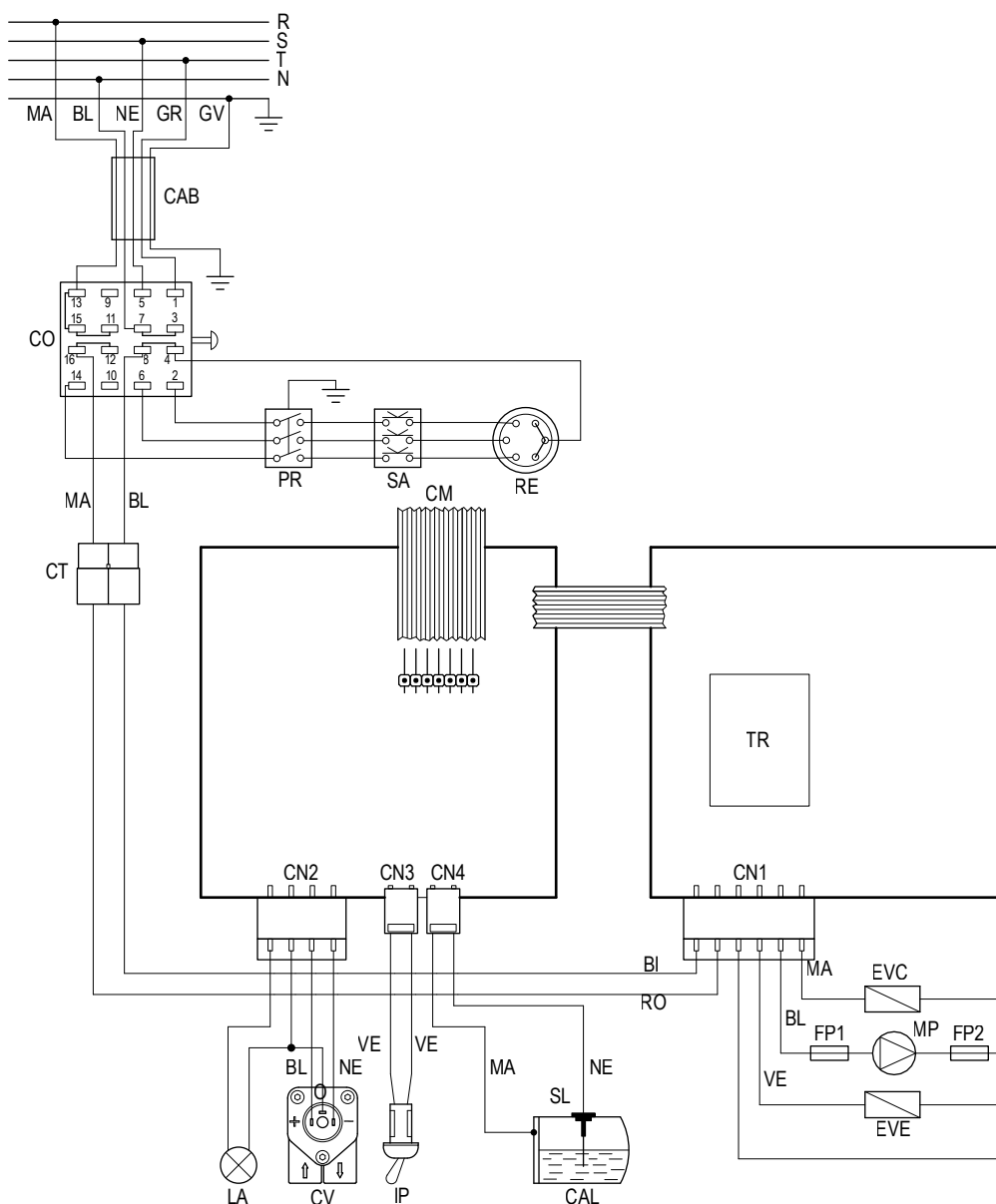
13.5 SAE-DISPLAY version

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.

Machine		Control unit power supply	Control unit code	Giemme Paragraph	Gicar Paragraph
ARGENTA	JUN	120V	18366	13.5.1	
		230V	18365	13.5.1	
	1-2-3GR	120V	18078	13.5.4	
		230V	18079	13.5.4	
BRAVA	4GR	230V	18077	13.5.4	
	1-2-3GR	120V	18090017	13.5.5	13.5.6
		230V	18090016	13.5.5	13.5.6
CALYPSO	1-2-3GR	230V	18090028	13.5.5	13.5.6
		120V	18090030	13.5.7	13.5.8
CALYPSO CRONO	1-2-3GR	230-240V	18090031	13.5.7	13.5.8
		230-240V	18090031A	13.5.9	13.5.10
CALYPSO DISPLAY	1-2-3-4GR	120V	18090079	13.5.13	
		230V	18090080	13.5.13	
		230V	18090080A	13.5.14	
CKXE	CKX	120-230V	18090067	13.5.16	
	CKXE		18090068	13.5.16	
DENISE	1-2-3GR	120V	18078	13.5.4	
		230V	18079	13.5.4	
	4GR	230V	18077	13.5.4	
DIVINA	JUN	120V	18371011	13.5.2	
		230V	18371010	13.5.2	
	1-2-3GR	120V	18090017	13.5.5	13.5.6
		230-240V	18090016	13.5.5	13.5.6
	4GR	120V	18090029	13.5.5	13.5.6
		230-240V	18090028	13.5.5	13.5.6
DORA	JUN	120V	18366	13.5.1	
		230V	18365	13.5.1	
	1-2-3GR	120V	18090030	13.5.7	13.5.8
		230-240V	18090031	13.5.7	13.5.8
FORMA	1-2GR	230V	18088004	13.5.19	
	3-4GR		18088005	13.5.19	
GLORIA	1-2-3GR	120V	18090047	13.5.11	13.5.12
		230V	18090048	13.5.11	13.5.12
GLORIA DISPLAY	1-2-3-4GR	120V	18090079	13.5.13	
		230V	18090080	13.5.13	
		230V	18090080A	13.5.14	
GLORIA LCL	1-2-3GR	120V	18090051	13.5.15	
		230V	18090052	13.5.15	
GLORIA R12	1-2-3GR	120V	18090047	13.5.11	13.5.12
		230V	18090048	13.5.11	13.5.12
GLORIA R12 DISPLAY	1-2-3-4GR	120V	18090079	13.5.13	
		230V	18090080	13.5.13	
		230V	18090080A	13.5.14	
HOLLYWOOD	2-3GR	230V	18090080A	13.5.14	

Machine		Control unit power supply	Control unit code	Giemme Paragraph	Gicar Paragraph
LISA	JUN	120V	18366	13.5.1	
		230V	18365	13.5.1	
LISA	1-2-3GR	120V	18078	13.5.4	
		230V	18079	13.5.4	
	4GR	230V	18077	13.5.4	
LISA R	1-2-3GR	120V	18090047	13.5.11	13.5.12
		230V	18090048	13.5.11	13.5.12
LISA R DISPLAY	1-2-3-4GR	120V	18090079	13.5.13	
		230V	18090080	13.5.13	
		230V	18090080A	13.5.14	
LISA LCL	1-2-3GR	120V	18090051	13.5.15	
		230V	18090052	13.5.15	
NEW START	1-2-3GR	120V	18090030	13.5.7	13.5.8
		230-240V	18090031	13.5.7	13.5.8
PERLA	JUN	120V	18090065	15.3.3	
		230V	18090066	15.3.3	
	1-2-3GR	120V	18090047	13.5.11	13.5.12
		230V	18090048	13.5.11	13.5.12
PERLA DISPLAY	1-2-3-4GR	120V	18090079	13.5.13	
		230V	18090080	13.5.13	
		230V	18090080A	13.5.14	
PERLA LCL	1-2-3GR	120V	18090051	13.5.15	
		230V	18090052	13.5.15	
PRATIC	1-2-3GR	120V	18090030	13.5.7	13.5.8
		230-240V	18090031	13.5.7	13.5.8
PRATIC AVANT	1-2-3GR	120V	18090030	13.5.7	13.5.8
		230-240V	18090031	13.5.7	13.5.8
PRATIC AVANT EXTRA	1-2-3GR	120V	18090030	13.5.7	13.5.8
		230-240V	18090031	13.5.7	13.5.8
SETTANTA	1-2-3GR	120V	18090047	13.5.11	13.5.12
		230V	18090048	13.5.11	13.5.12
SETTANTA DISPLAY	1-2-3-4GR	120V	18090079	13.5.13	
		230V	18090080	13.5.13	
		230V	18090080A	13.5.14	
SETTANTA LCL	1-2-3GR	120V	18090051	13.5.15	
		230V	18090052	13.5.15	
SIBILLA	1-2-3GR	120V	18090047	13.5.11	13.5.12
		230V	18090048	13.5.11	13.5.12
SIBILLA DISPLAY	1-2-3-4GR	120V	18090079	13.5.13	
		230V	18090080	13.5.13	
		230V	18090080A	13.5.14	
TANYA	1-2-3GR	120V	18090030	13.5.7	13.5.8
		230-240V	18090031	13.5.7	13.5.8
TANYA CAPS-PODS	2GR	120V	18090146	13.5.20	
		230V	18090130	13.5.20	
TOUCH	1-2GR	230V	18088000	13.5.18	
	3-4GR		18088001	13.5.18	
VANIA	JUN	120V	18371011	13.5.2	
		230V	18371010	13.5.2	
	1-2-3GR	120V	18090017	13.5.5	13.5.6
		230-240V	18090016	13.5.5	13.5.6

Wiring diagram code 18365 - 18366 *JUNIOR*



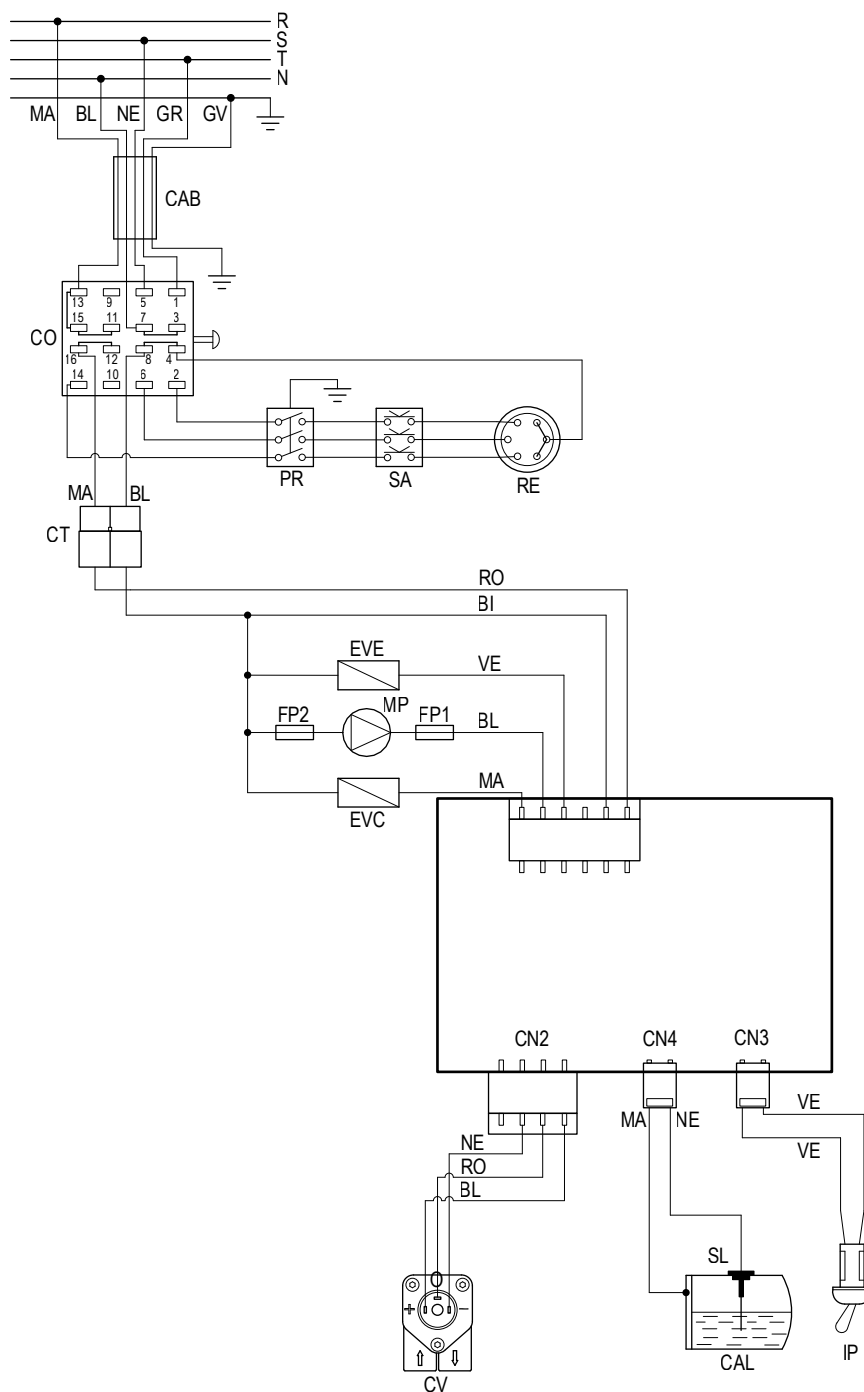
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CM	Membrane connection
CN1	Power supply and services outputs
CN2	Dosing device output
CN3	Programming switch
CN4	Heating unit level
CO	Power switch
CT	Power supply connector
CV	Volumetric counter

EVC	Heating unit filling solenoid valve
EVE	Dispensing solenoid valve
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230 V
GR	Grey
GV	Yellow-green
IP	Programming switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PR	Pressure switch

RE	Heating element
RO	Red
SA	Safety heating element
SL	Heating unit level probe
TR	Transformer
VE	Green

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

13.5.1 Wiring diagram code 18371010 - 18371011 *JUNIOR*



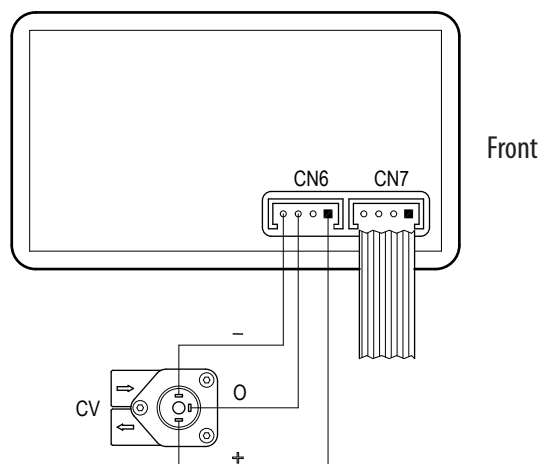
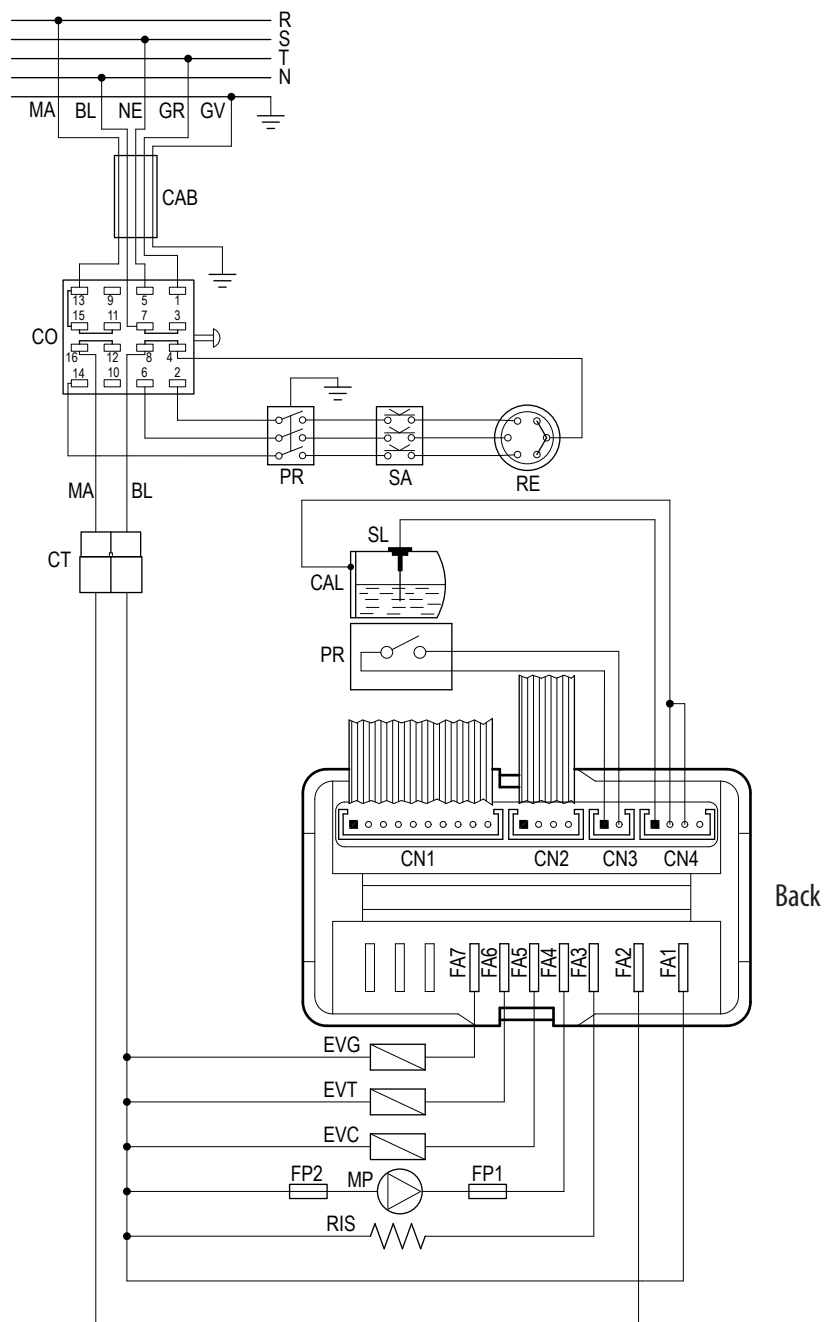
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CM	Membrane connection
CN1	Power supply and services outputs
CN2	Dosing device output
CN3	Programming switch
CN4	Heating unit level
CO	Power switch
CT	Power supply connector
CV	Volumetric counter

EVC	Heating unit filling solenoid valve
EVE	Dispensing solenoid valve
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230 V
GR	Grey
GV	Yellow-green
IP	Programming switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PR	Pressure switch

RE	Heating element
RO	Red
SA	Safety heating element
SL	Heating unit level probe
TR	Transformer
VE	Green

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

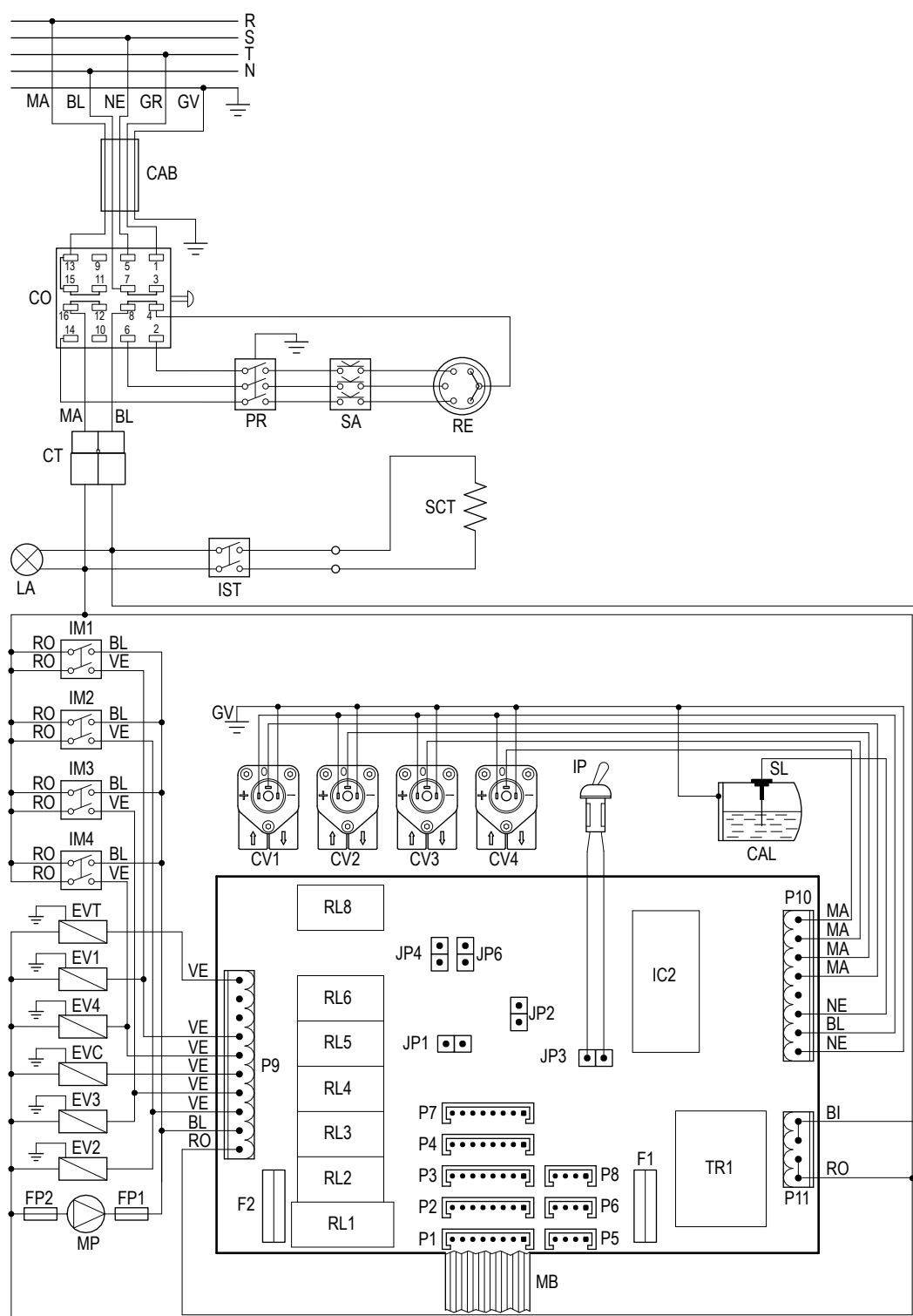
13.5.2 Wiring diagram code 18090065 - 18090066 *JUNIOR*



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

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

13.5.3 Wiring diagram code 18077 - 18078 - 18079

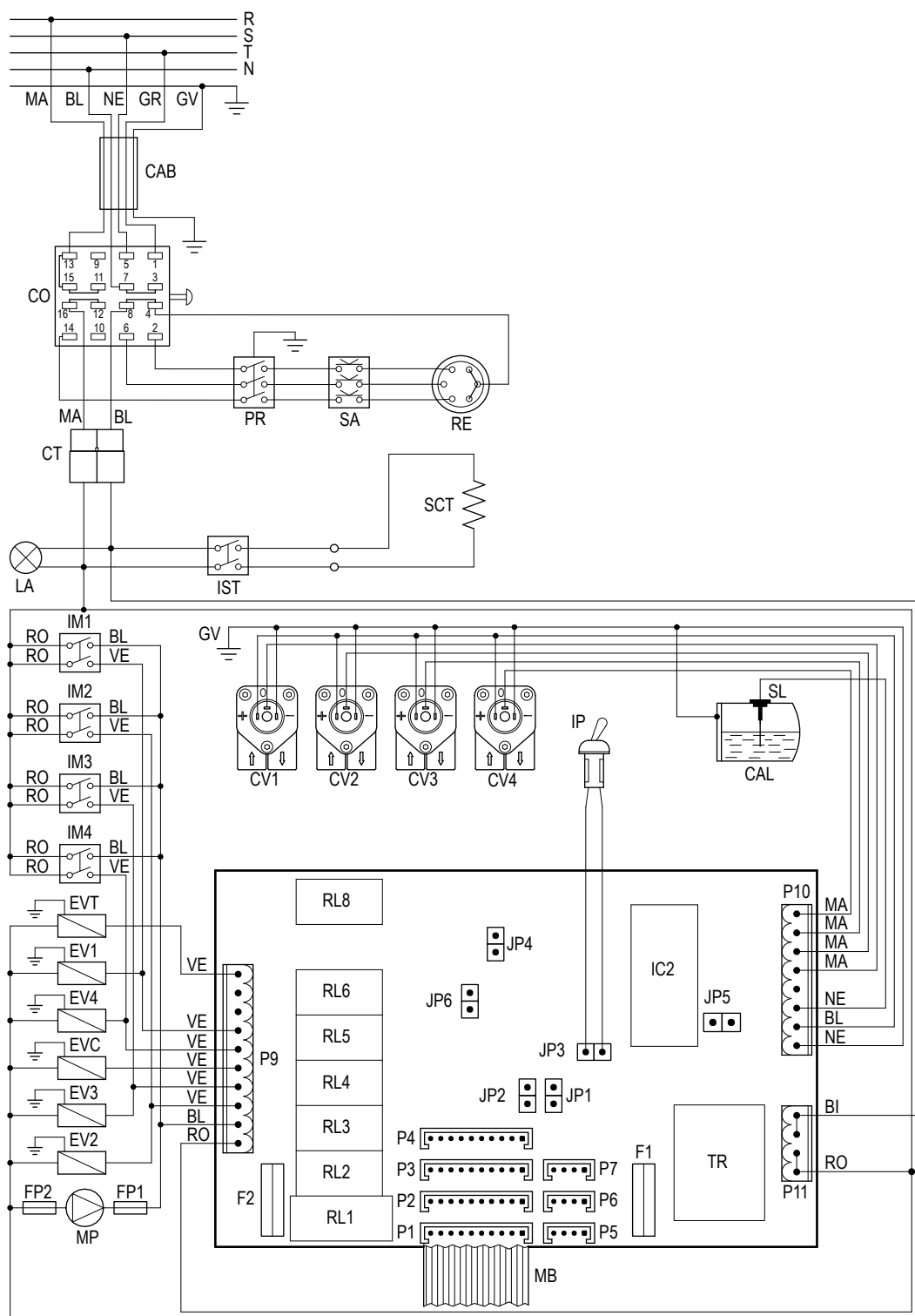


JUMPER	INSERTED	NOT INSERTED
JP1	Serial connection enabled	Serial connection disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming switch	
JP4	Filling the heating unit with the pump	Filling the heating unit without the pump
JP6	Dispensing tea with the pump	Dispensing tea without the pump

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

BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CO	Power switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
CV4	Flow meter GR4
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EV4	GR4 solenoid valve
EVC	Filling solenoid valve
EVT	Tea solenoid valve
F1	Motor pump fuse (500 mA)
F2	Inlet fuse (6.3 A)
FP1(*)	Motor pump fuse UL (OPD) fuse
FP1(*)	230 V UL (OPD) fuse
GR	Grey
GV	Yellow-green
IC2	Eprom
IM1	Manual switch GR1
IM2	Manual switch GR2
IM3	Manual switch GR3
IM4	Manual switch GR4
IP	Programm. switch
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
P1	PB panel connector GR1
P2	PB panel connector GR2
P3	PB panel connector GR3
P4	PB panel connector GR4
P5	Tea button connector
P7	Serial connection
P9	Steam outlet connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Heating element
RL1	Pump relay
RL2	GR2 solenoid valve relay
RL3	GR3 solenoid valve relay
RL4	Heating unit solenoid valve relay
RL5	GR4 solenoid valve relay
RL6	GR1 solenoid valve relay
RL8	Tea solenoid valve relay
RO	Red
SA	Safety heating element
SL	Heating unit level probe
TR1	Transformer
VE	Green

13.5.4 Wiring diagram code 18090016 - 18090017 - 18090028 - 18090029 *GIEMME*

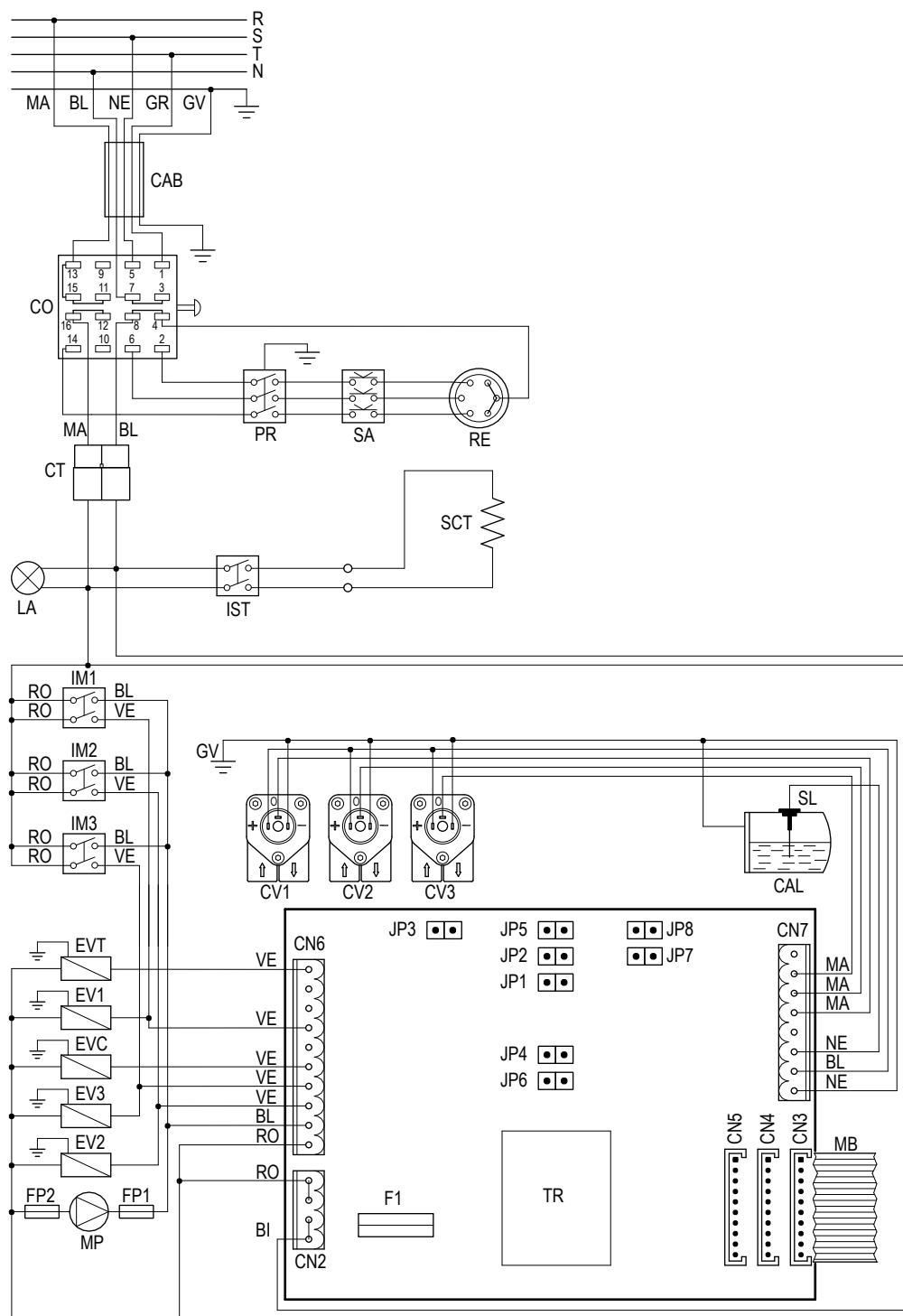


BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CO	Power switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
CV4	Flow meter GR4
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EV4	GR4 solenoid valve
EVC	Filling solenoid valve
EVT	Tea solenoid valve
F1	Motor pump fuse (500 mA)
F2	Inlet fuse (6.3 A)
FP1(*)	Motor pump fuse UL (OPD) fuse
FP1(*)	230 V UL (OPD) fuse
GR	Grey
GV	Yellow-green
IC2	Eprom
IM1	Manual switch GR1
IM2	Manual switch GR2
IM3	Manual switch GR3
IM4	Manual switch GR4
IP	Programm. switch
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
P1	PB panel connector GR1
P2	PB panel connector GR2
P3	PB panel connector GR3
P4	PB panel connector GR4
P5	Tea button connector
P7	Serial connection
P9	Steam outlet connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Heating element
RL1	Pump relay
RL2	GR2 solenoid valve relay
RL3	GR3 solenoid valve relay
RL4	Heating unit solenoid valve relay
RL5	GR4 solenoid valve relay
RL6	GR1 solenoid valve relay
RL8	Tea solenoid valve relay
RO	Red
SA	Safety heating element
SL	Heating unit 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 switch	
JP4	Filling the heating unit with the pump	Filling the heating unit without the pump
JP6	Dispensing tea with the pump	Dispensing tea without the pump

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

13.5.7 Wiring diagram code 18090030 - 18090031 *GICAR*

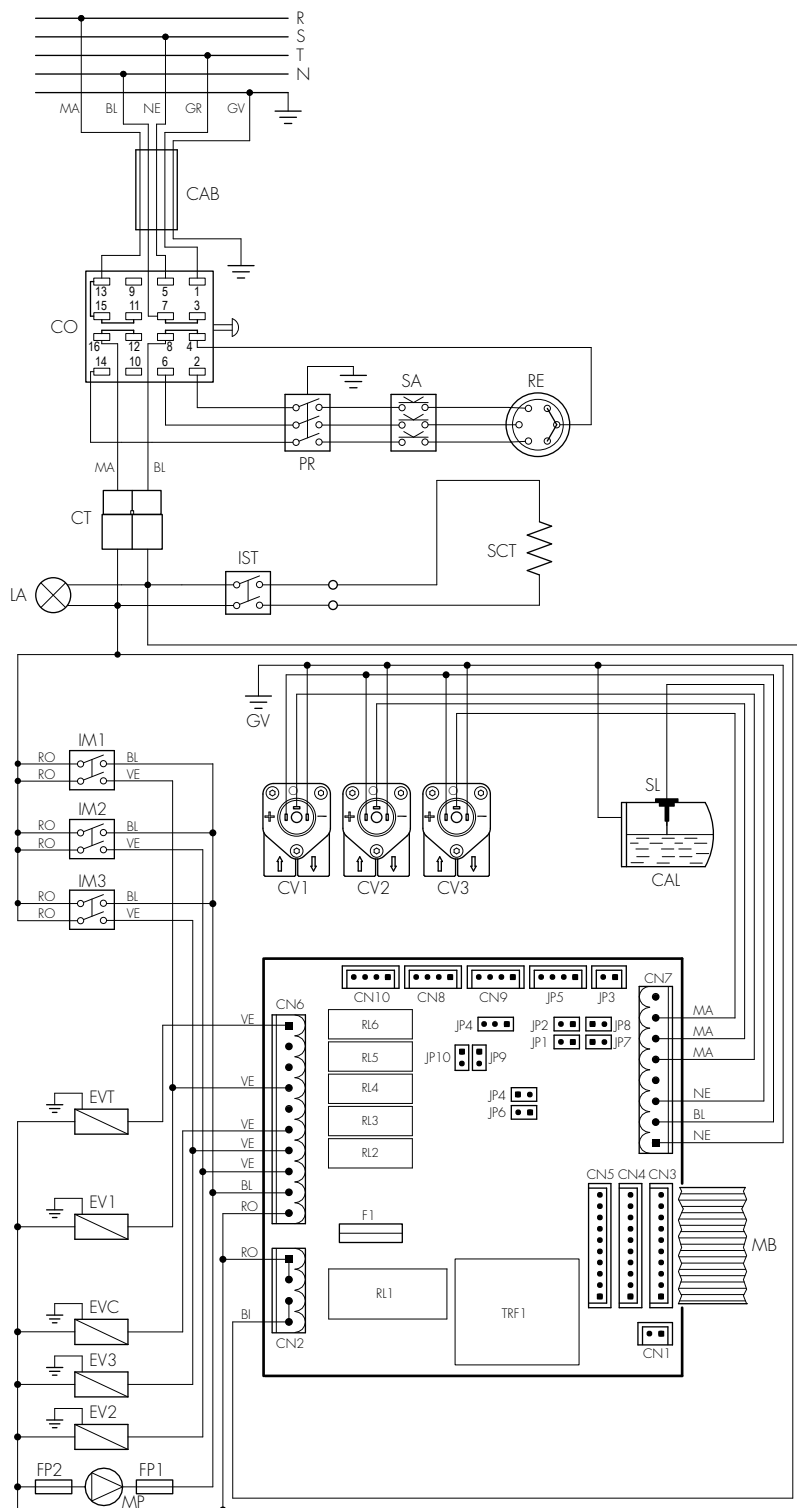


BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CN2	Power supply connector
CN3	PB panel connector GR1
CN4	PB panel connector GR2
CN5	PB panel connector GR3
CN6	Steam outlet connector
CN7	Low voltage connector
CO	Power switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (10 A)
FP1(*)	Motor pump fuse UL (OPD) fuse
FP2(*)	230 V UL (OPD) fuse
GR	Grey
GV	Yellow-green
IM1	Manual switch GR1
IM2	Manual switch GR2
IM3	Manual switch GR3
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Heating element
RO	Red
SA	Safety heating element
SCT	Cup warmer
SL	Heating unit 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	Filling the heating unit with the pump	Filling the heating unit without the pump
JP5	Tea function button enabled	Tea function button disabled
JP6	Dispensing tea with the pump	Dispensing tea without the pump
JP7	STOP continuous button disabled	STOP continuous button enabled
JP8	Not managed	Not managed

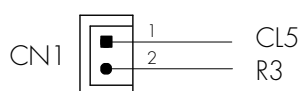
(*) Fuses for UL versions where a plug with a capacity greater than 30 A is installed

13.5.8 Wiring diagram code 18090031A *GIEMME*

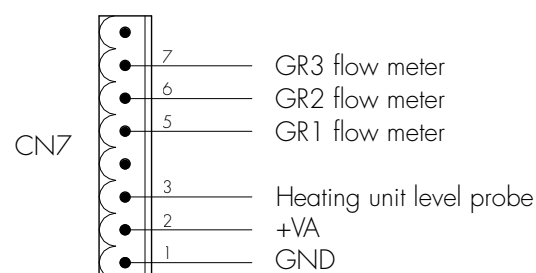


BI	White
BL	Blue
CAL	Heating unit
CO	Power switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (10 A)
FP1(*)	Motor pump fuse UL (OPD) fuse
FP2(*)	230 V UL (OPD) fuse
GR	Grey
GV	Yellow-green
IM1	Manual switch GR1
IM2	Manual switch GR2
IM3	Manual switch GR3
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Heating element
RL1	Tea solenoid valve relay
RL2	GR1 solenoid valve relay
RL3	Heating unit solenoid valve relay
RL4	GR3 solenoid valve relay
RL5	GR2 solenoid valve relay
RL6	Pump relay
RO	Red
SA	Safety heating element
SL	Heating unit level probe
TRF	Transformer
VE	Green

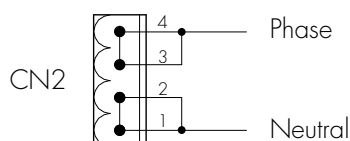
LEVEL LED connector



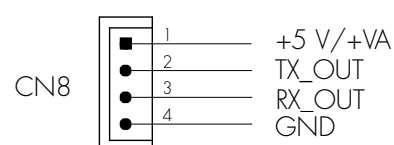
INLET connector



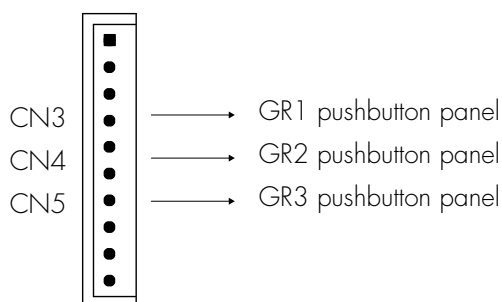
POWER SUPPLY connector



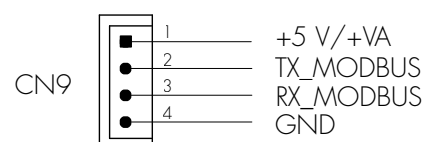
TILL RS232 SERIAL connector



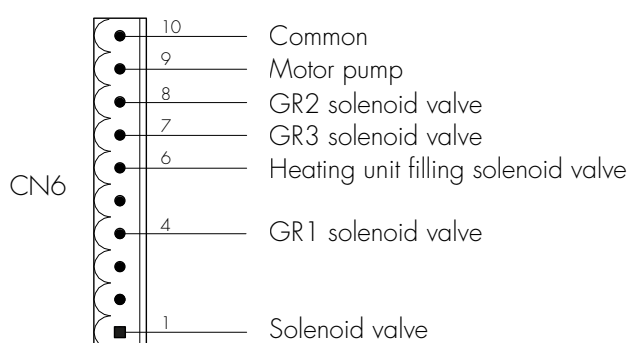
PUSHBUTTON PANEL connectors



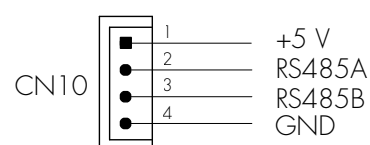
RS232 TELEMETRY connector



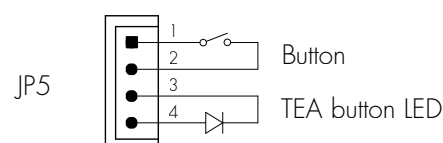
OUTLET connector



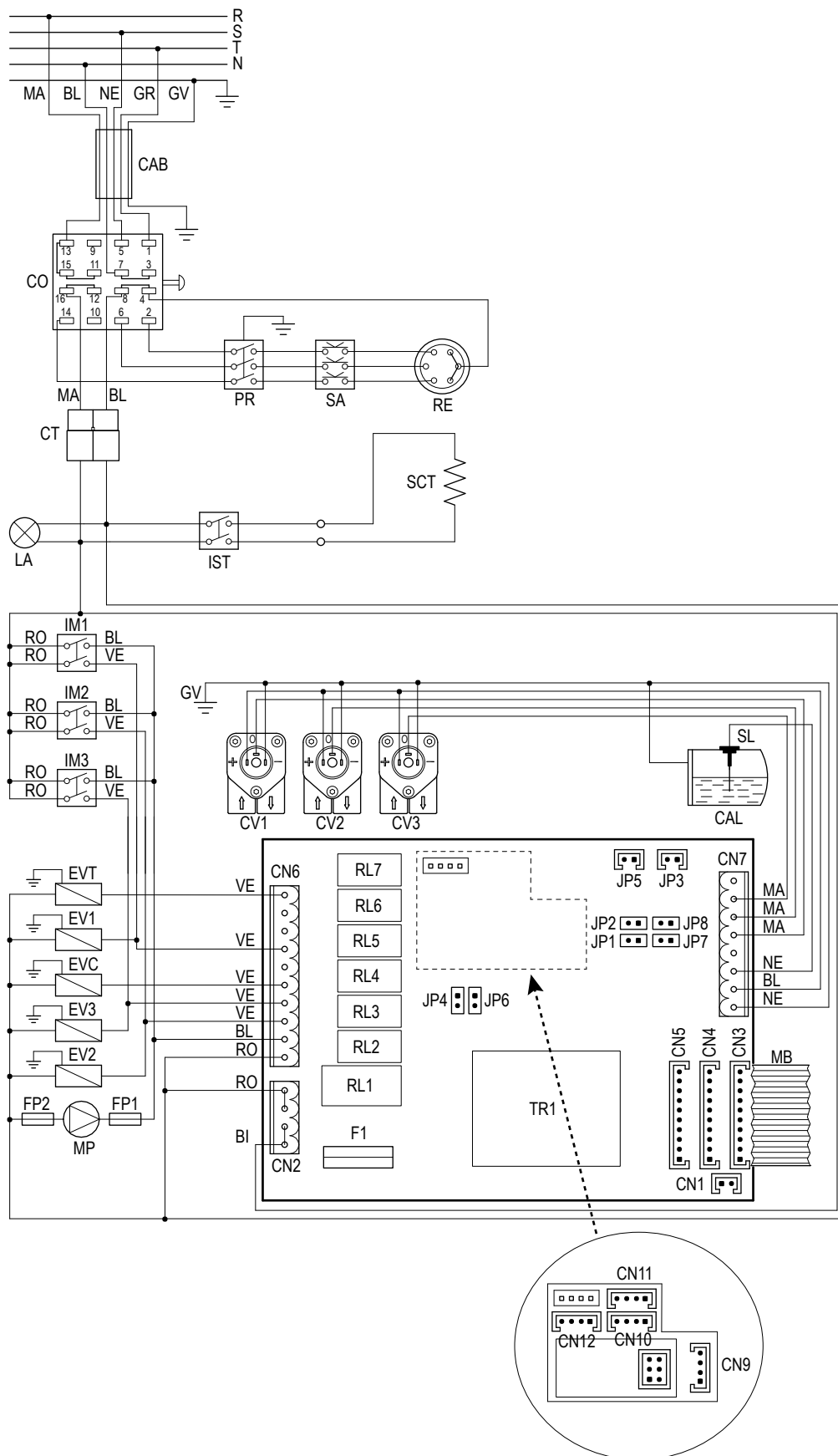
RS485 connector



BUTTON connector

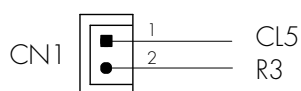


13.5.9 Wiring diagram code 18090031A *GICAR*

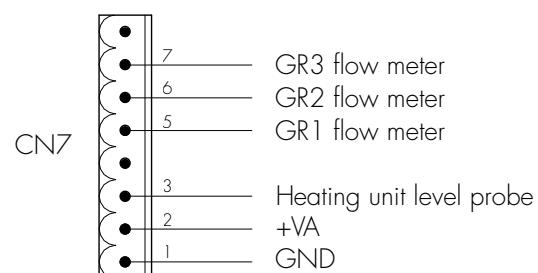


BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CN2	Power supply connector
CN3	PB panel connector GR1
CN4	PB panel connector GR2
CN5	PB panel connector GR3
CN6	Steam outlet connector
CN7	Low voltage connector
CO	Power switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (10 A)
FP1(*)	Motor pump fuse UL (OPD) fuse
FP2(*)	230 V UL (OPD) fuse
GR	Grey
GV	Yellow-green
IM1	Manual switch GR1
IM2	Manual switch GR2
IM3	Manual switch GR3
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
PR	Pressure switch
RE	Heating element
RO	Red
SA	Safety heating element
SCT	Cup warmer
SL	Heating unit level probe
TR	Transformer
VE	Green

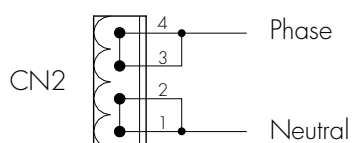
LEVEL LED connector



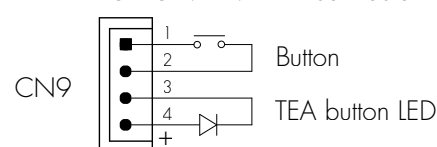
INLET connector



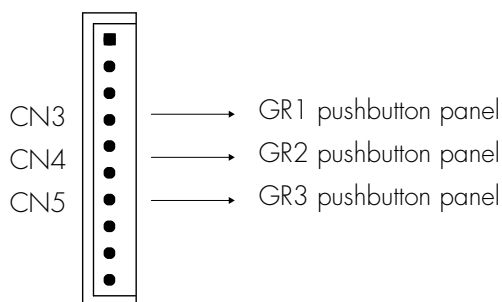
POWER SUPPLY connector



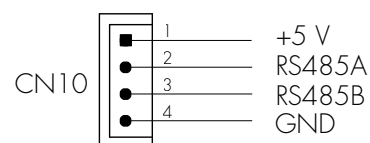
BUTTON AND LED connector



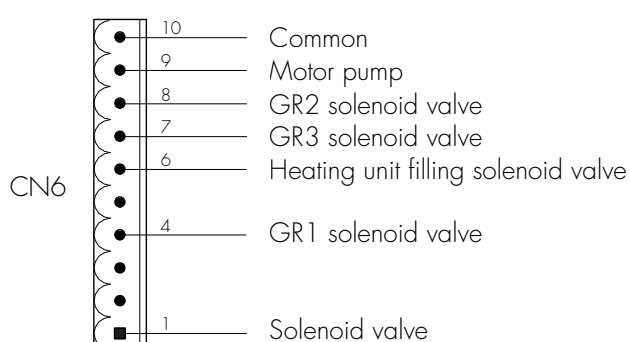
PUSHBUTTON PANEL connectors



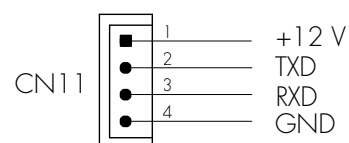
RS232 connector



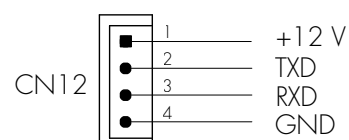
OUTLET connector



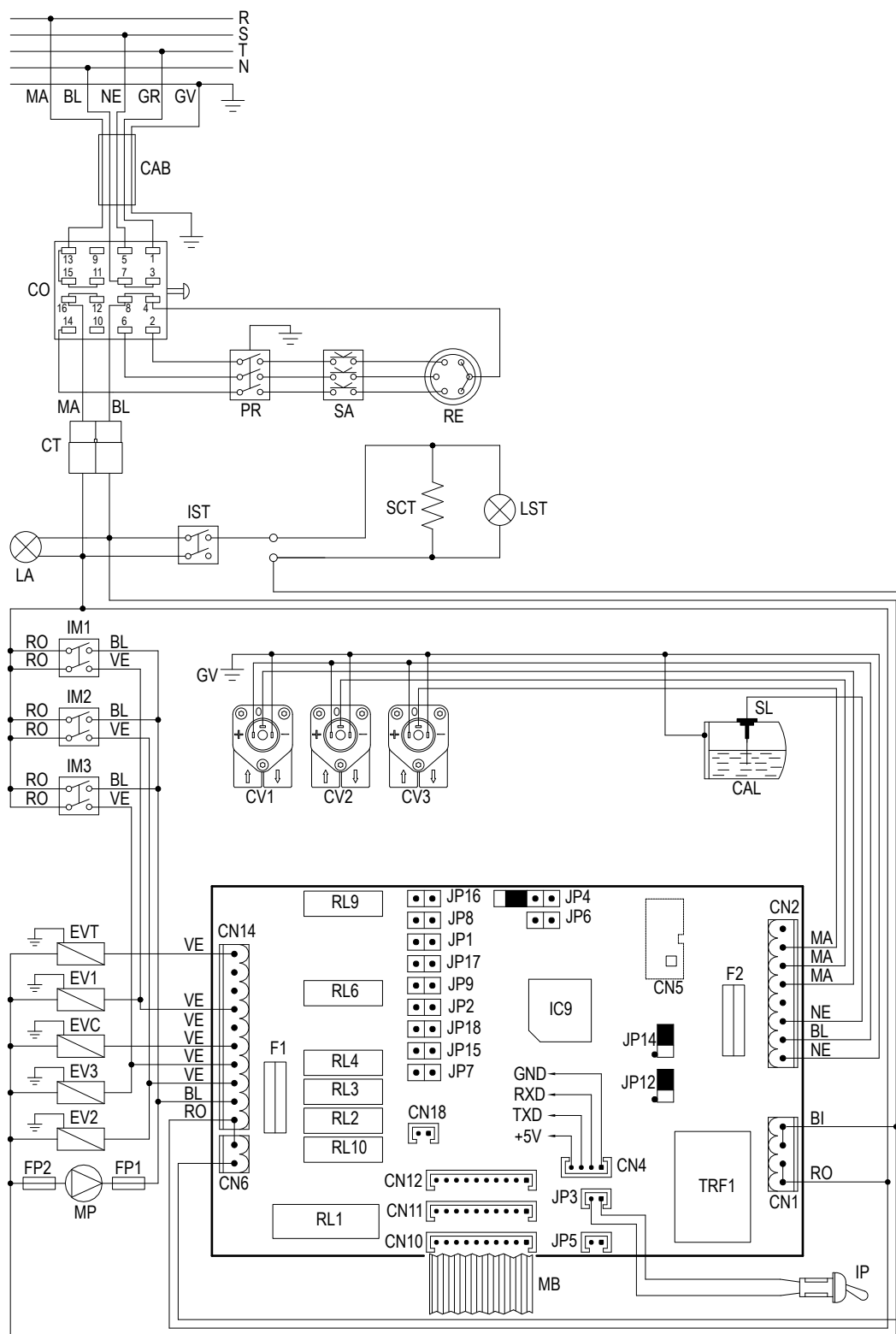
TILL RS232 connector



MODBUS RS232 connector



13.5.10 Wiring diagram code 18090047 - 18090048 *GIEMME*



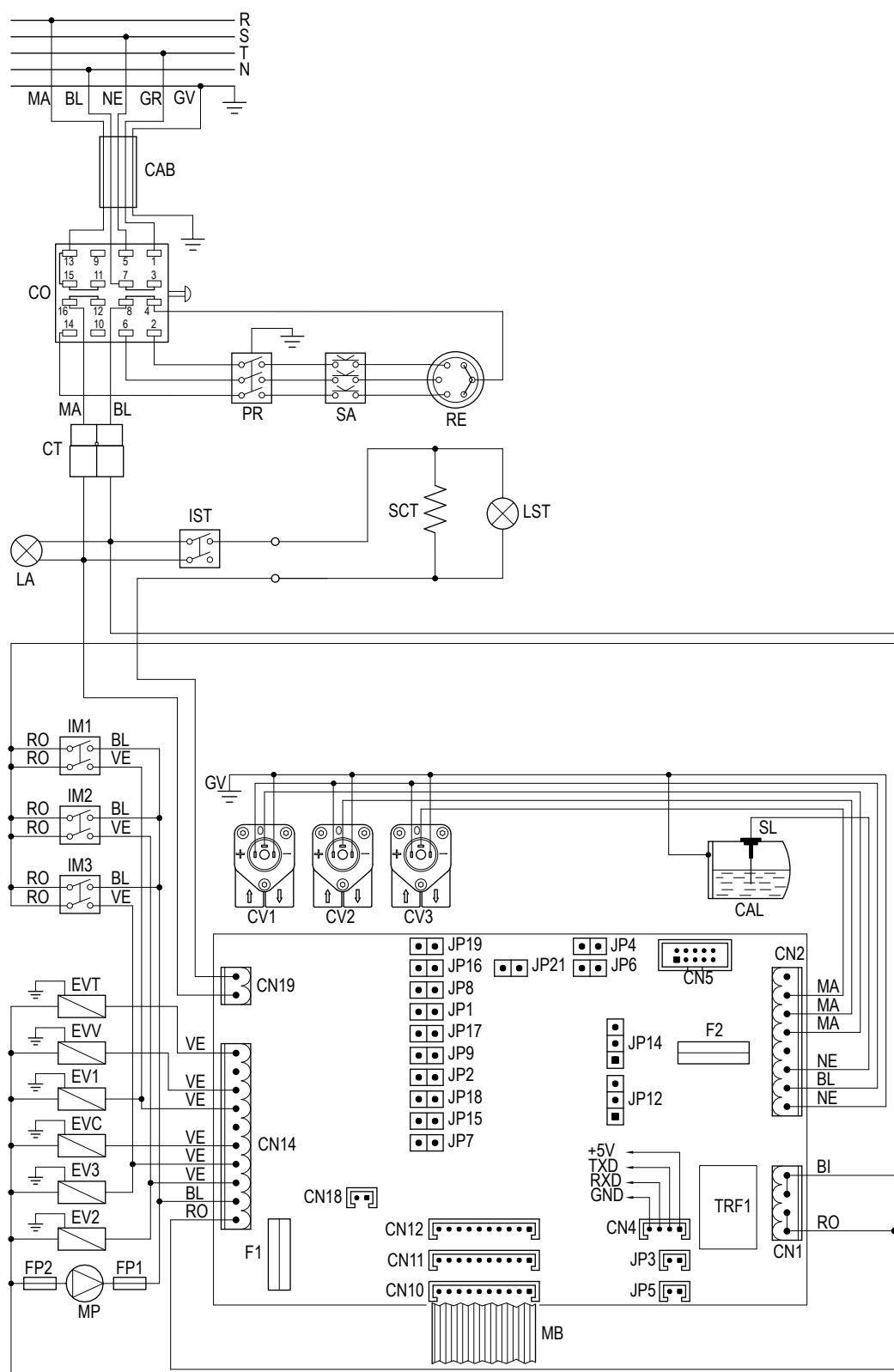
BI	White
BL	Blue
CAL	Heating unit
CN1	Power supply connector
CN2	Low voltage connector
CN4	Serial transmission connector
CN10	PB panel connector GR1
CN11	PB panel connector GR2
CN12	PB panel connector GR3
CO	Power switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Filling solenoid valve
EVT	Tea solenoid valve
F1	Inlet fuse (6.3 A)
F2	Motor pump fuse (500 mA)
FP1(*)	Motor pump fuse UL (OPD) fuse
FP2(*)	230 V UL (OPD) fuse
GR	Grey
GV	Yellow-green
IC2	Microprocessor
IM1	Manual switch GR1
IM2	Manual switch GR2
IM3	Manual switch GR3
IP	Programm. switch
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
P5	Tea dose
P6	Not managed
P7	Serial connection
P9	Steam outlet connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Heating element
RO	Red
SA	Safety heating element
SL	Heating unit 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 switch connection	
JP4	Filling the heating unit with the pump	Filling the heating unit without the pump
JP5	Tea switch connection	
JP6	Dispensing tea with the pump	Dispensing tea without the 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 buttons enabled	Display function buttons disabled
JP16	6-button pushbutton panel enabled	4-button pushbutton panel enabled
JP17	Heating unit temp. check with external pressure switch (always on)	
JP18	Heat.temp./press. management always ON (always inserted)	

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

13.5.11 Wiring diagram code 18090047 - 18090048 *GICAR*



BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CN1	Power supply connector
CN2	Low voltage connector
CN4	Serial transmission connector
CN10	PB panel connector GR1
CN11	PB panel connector GR2
CN12	PB panel connector GR3
CN14	Steam outlet connector
CN18	Connector Warmer connect.
CN19	Cup warmer heating el. connector
CO	Power switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Filling solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
F1	Inlet fuse (6.3 A)
F2	Motor pump fuse (500 mA)
FP1(*)	Motor pump fuse UL (OPD) fuse
FP2(*)	230 V UL (OPD) fuse
GR	Grey
GV	Yellow-green
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
P5	Tea dose
P6	Not managed
P7	Serial connection
P9	Steam outlet connector
P10	Low voltage connector
P11	Power supply
PR	Pressure switch
RE	Heating element
RO	Red
SA	Safety heating element
SL	Heating unit 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 switch connection	
JP4	Filling the heating unit with the pump	Filling the heating unit without the pump
JP5	Tea switch connection	
JP6	Dispensing tea with the pump	Dispensing tea without the 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 buttons enabled	Display function buttons disabled
JP16	6-button pushbutton panel enabled	4-button pushbutton panel enabled
JP17	Heating unit temp. check with external pressure switch (always on)	
JP18	Heat.temp./press. management always ON (always inserted)	

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

AP	Air pump supply
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CN1	Power supply connector
CN2	Low voltage connector
CN3	Display card conn. connector
CN4	Serial transmission connector
CN5	Programm. connector ISP
CN6	Cup warmer heating el. connector
CN10	GR1 pushbutton panel connector
CN11	GR2 pushbutton panel connector
CN12	GR3 pushbutton panel connector
CN13	GR4 pushbutton panel connector
CN14	Steam outlet connector
CN16	Automatic steam wand NTC connector
CN17	Heating unit NTC connector
CN18	Cup warmer NTC connector
CPA	Air pump connector
CT	Power supply connector
CV1	GR1 volumetric counter
CV2	GR2 volumetric counter
CV3	GR3 volumetric counter
CV4	GR4 volumetric counter
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EV4	GR4 solenoid valve
EVC	Heating unit filling solenoid valve
EVT	Tea solenoid valve

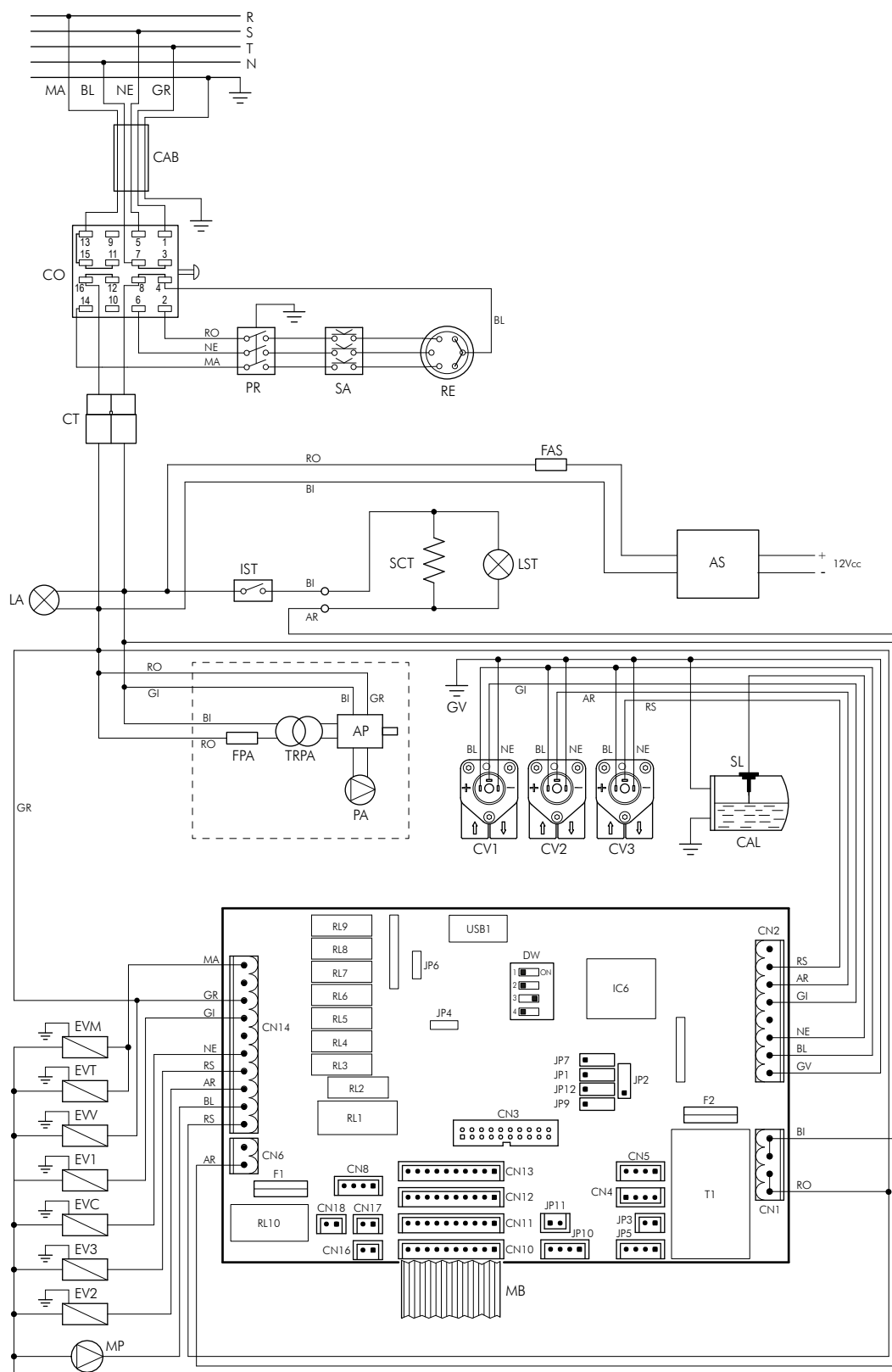
EVV	Steam solenoid valve
F1	Inlet fuse (6.3 A)
F2	Motor pump fuse (500 mA)
FPA	Air pump fuse (1 A)
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230 V
GR	Grey
GV	Yellow-green
IC9	Microprocessor
IG	Main switch
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IM4	GR4 manual switch
IST	Cup warmer switch
LA	Indicator light
LST	Cup warmer LED
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
PA	Vcc air pump
PR	Pressure switch
RE	Heating element
RO	Red
SA	Safety heating element
SCT	Cup warmer heating element
TLR	Remote switch
TRF1	Transformer
TRPA	Air pump transformer
VE	Green

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

JUMPER	INSERTED	NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Programming key connection	
JP4	Filling the heating unit with the pump	Filling the heating unit without the pump
JP5	Tea button connection	
JP6	Dispensing tea with the pump	Dispensing tea without the pump
JP7	Continuous function disabled	Continuous function enabled
JP8	Dose count enabled	Dose count disabled
JP9	Credit/Debit enabled	Credit/Debit disabled

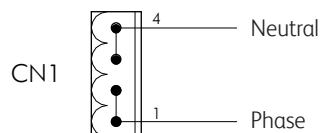
JUMPER	INSERTED	NOT INSERTED
JP10	Automatic steam wand	
JP12	Not managed	Not managed
JP14	Not managed	Not managed
JP15	Display function buttons enabled	Display function buttons disabled
JP16	6-button pushbutton panel enabled	4-button pushbutton panel enabled
JP17	Heating unit temp. check with external pressure switch (always on)	
JP18	Heat temp./press. management always ON (always inserted)	

13.5.13 Wiring diagram code 18090080A

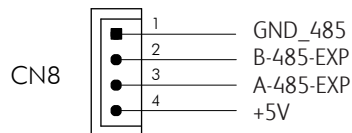


AP	Air pump supply
AR	Orange
AS	Switching power supply
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CO	Switch
CT	Power supply connector
CV1	Flow meter GR1
CV2	Flow meter GR2
CV3	Flow meter GR3
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Filling solenoid valve
EVM	Mix solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
FAS	Fuse T6,3 A
FPA	Air pump fuse (1 A)
GI	Yellow
GR	Grey
GV	Yellow-green
IST	Cup warmer switch
LA	Indicator light
LST	Cup warmer LED
MA	Brown
MB	Pushbutton panel membrane
MP	Motor pump
NE	Black
PA	Vcc air pump
PR	Pressure switch
RE	Heating element
RO	Red
RS	Pink
SA	Safety heating element
SCT	Cup warmer heating element
SL	Boiler level probe
TRPA	Air pump transformer

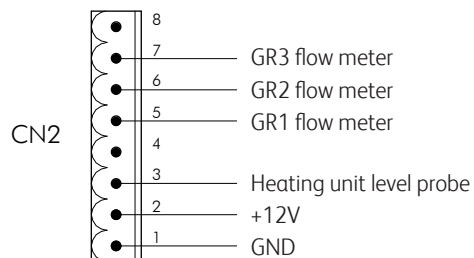
POWER SUPPLY connector



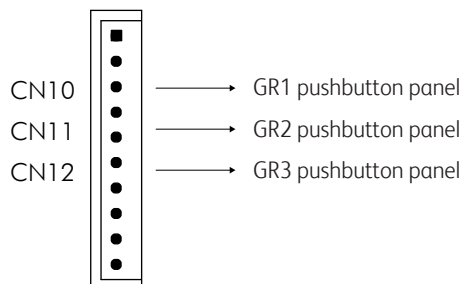
RS485 connector



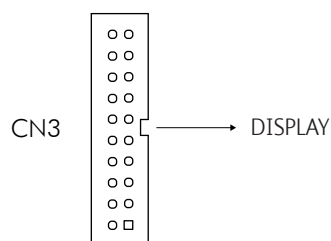
INLET connector



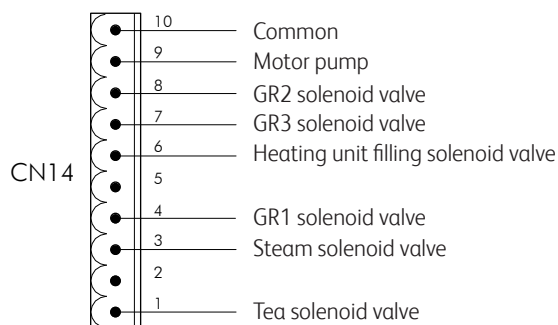
PUSHBUTTON PANEL connectors



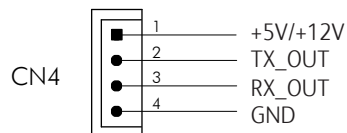
DISPLAY connector



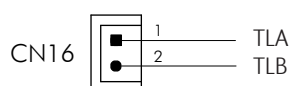
OUTLET connector



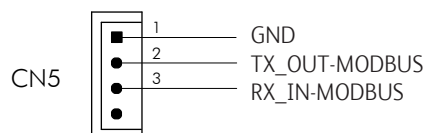
TILLRS232 SERIAL connector



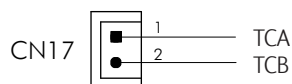
STEAM NTC connector



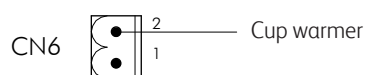
RS232 TELEMETRY connector



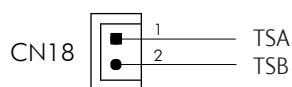
HEATING UNIT NTC connector



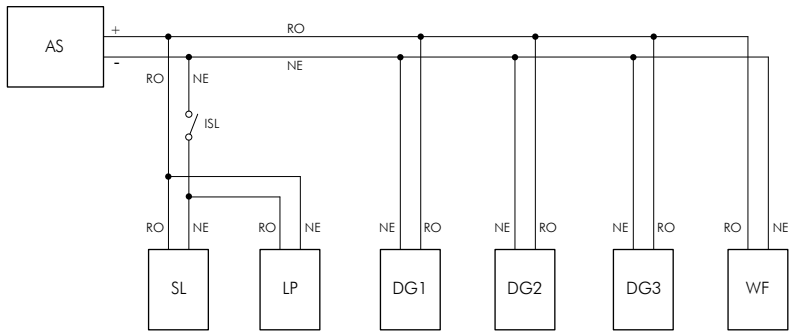
CUP WARMER OUTLET connector



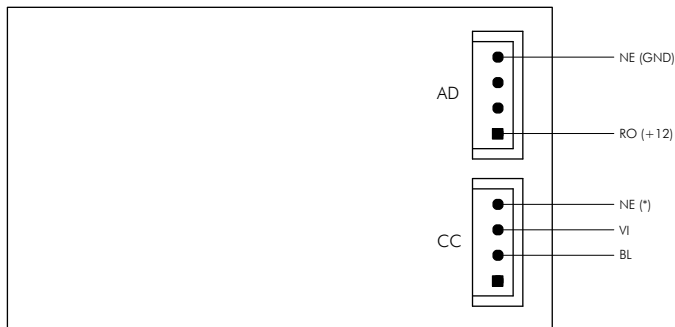
CUP WARMER NTC connector



SPOT LED and DIGIT connector

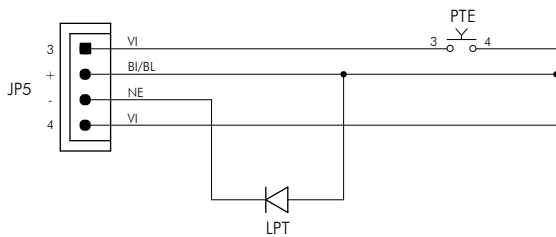


DIGIT connector

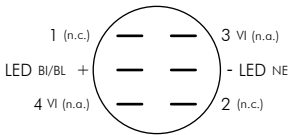


AD	Power supply Digit
AL	Power supply 12Vcc
BI	White
BL	Blue
CC	Communication with control unit
DG1	Digit GR1
DG2	Digit GR2
DG3	Digit GR3
GI	Yellow
LED	Status LED
LP	Rear LED
LPT	Tea button LED
MA	Brown
NE	Black
PTE	Tea button
RO	Red
RS	Pink
SL	Spot LED
VI	Violet
WF	Gateway WiFi
n.a.	Normally open
n.c.	Normally closed
(*)	Present only on the first connection
(**)	CN5 of the control unit

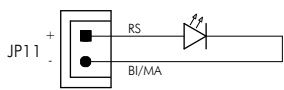
PUSH-BUTTON TEA connector



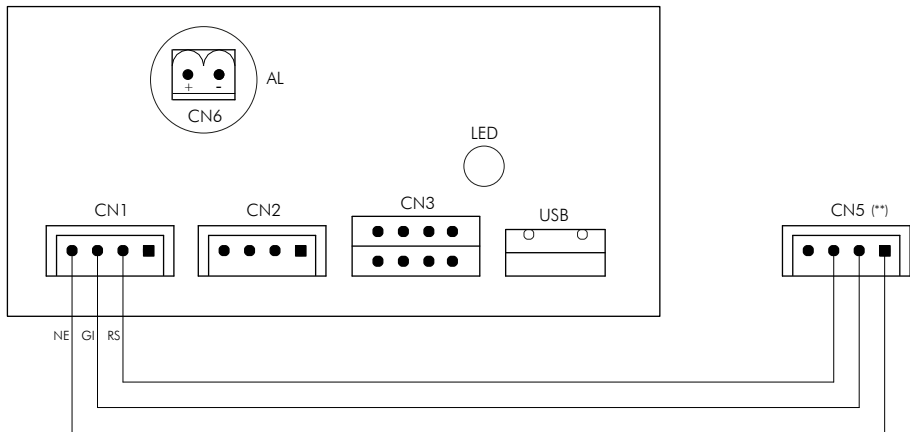
Faston contacts PUSH-BUTTON TEA



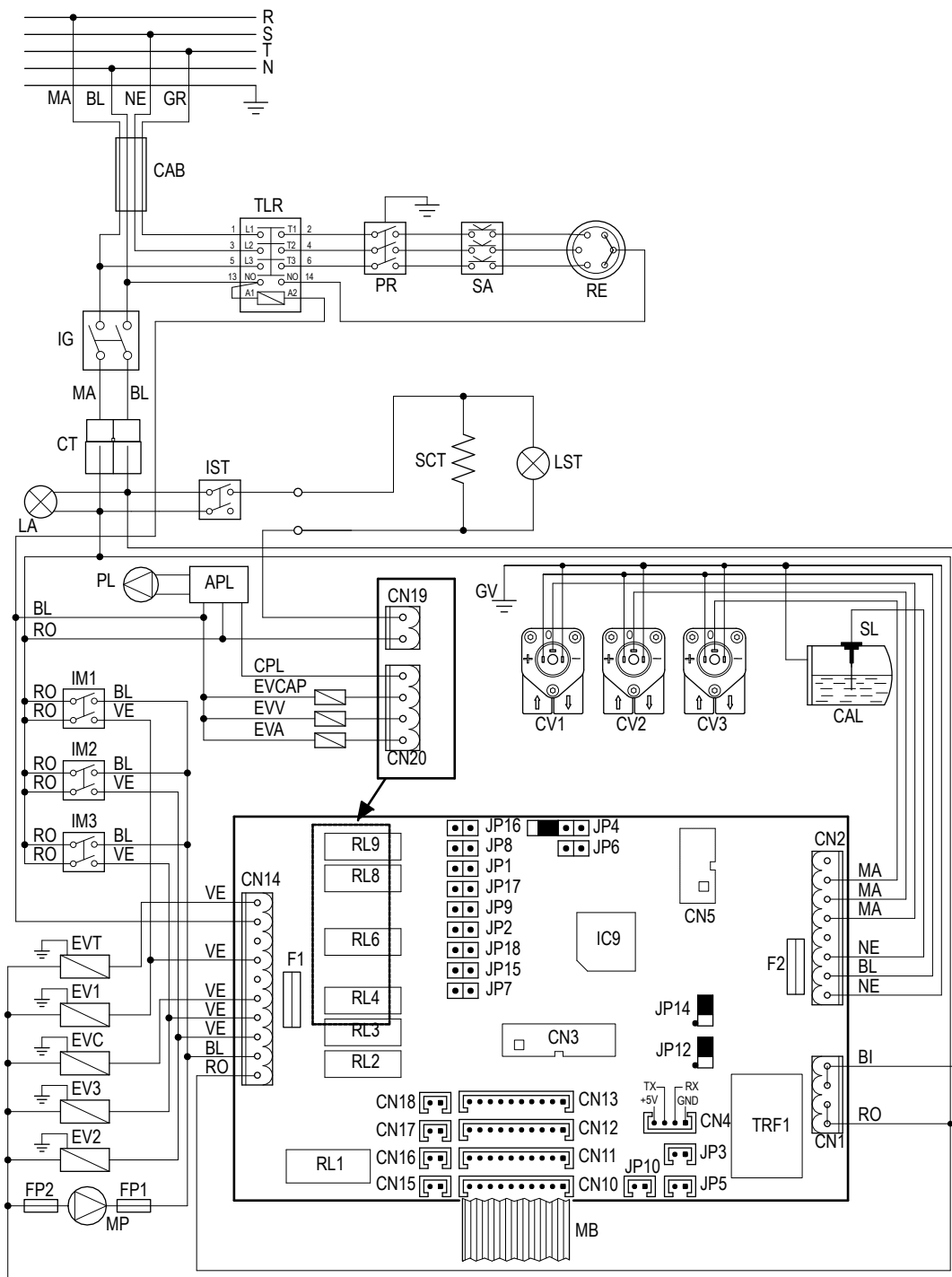
Charging LED



Gateway WIFI



13.5.14 Wiring diagram code 18090051 - 18090052



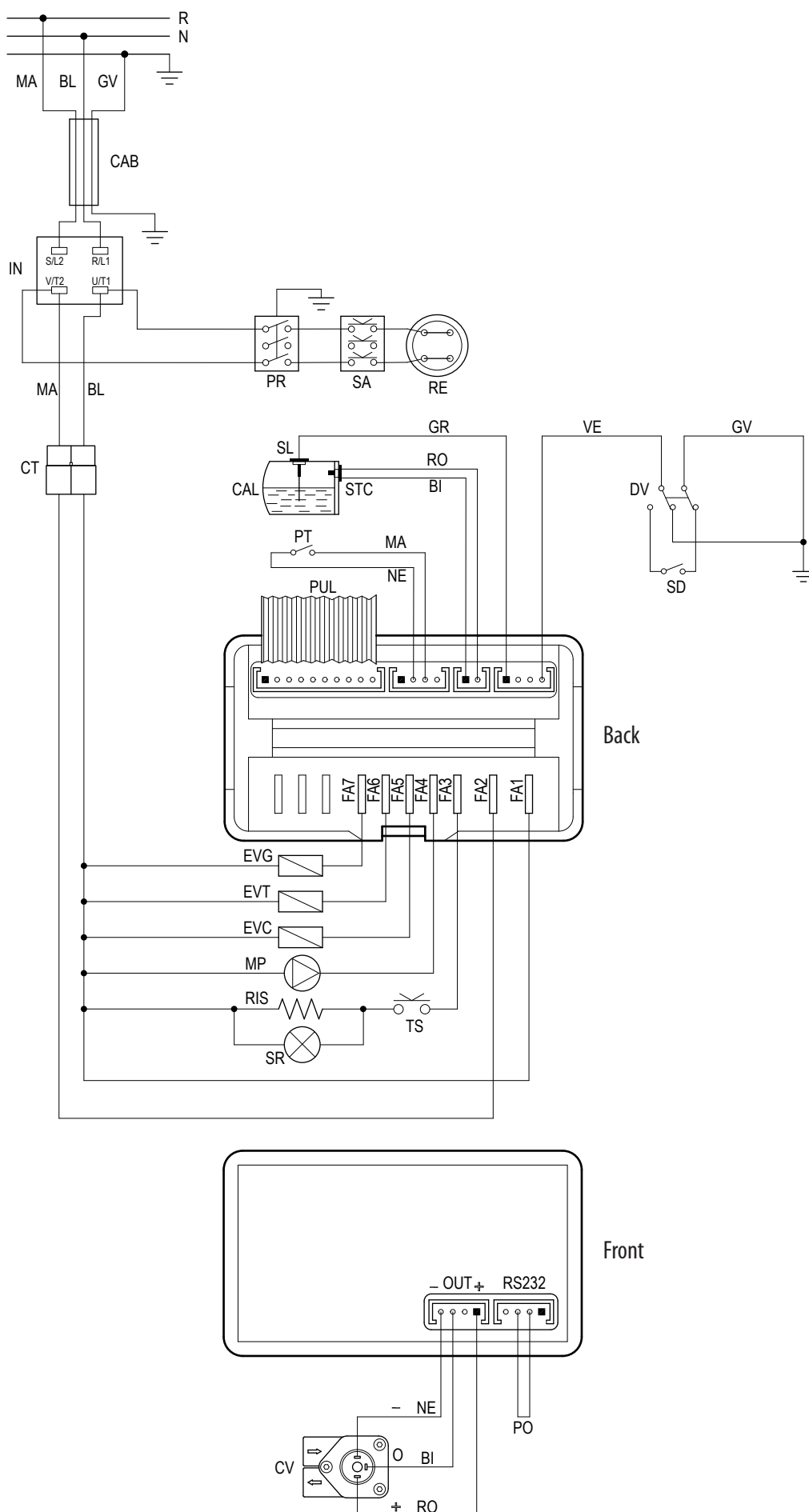
APL	Milk pump supply
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CN1	Power supply connector
CN2	Low voltage connector
CN3	Display card conn. connector
CN4	Serial transmission connector
CN5	Programm. connector ISP
CN10	GR1 pushbutton panel connector
CN11	GR2 pushbutton panel connector
CN12	GR3 pushbutton panel connector
CN13	Automatic SW/capp. connector
CN14	Steam outlet connector
CN16	Steam NTC connector
CN17	Heating unit NTC connector
CN18	Cup warmer NTC connector
CPL	Milk pump command
CT	Power supply connector
CV1	GR1 volumetric counter
CV2	GR2 volumetric counter
CV3	GR3 volumetric counter
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVA	Air solenoid valve
EVC	Heating unit filling solenoid valve
EVCAP	Cappucc. mak. solenoid valve
EVT	Tea solenoid valve
EVV	Steam solenoid valve
F1	Inlet fuse (6.3 A)
F2	Motor pump fuse (500 mA)
FP1(*)	UL (OPD) Motor pump fuse
FP2(*)	UL (OPD) Fuse for 230 V
GR	Grey
GV	Yellow-green
IC9	Microprocessor
IG	Main switch
IM1	GR1 manual switch
IM2	GR2 manual switch
IM3	GR3 manual switch
IST	Cup warmer switch
LA	Indicator light
MA	Brown
MP	Motor pump
NE	Black
PL	Milk pump
PR	Pressure switch
RE	Heating element
RO	Red
SA	Safety heating element
SCT	Cup warmer 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	Filling the heating unit with the pump	Filling the heating unit without the pump
JP5	Tea button connection	
JP6	Dispensing tea with the pump	Dispensing tea without the 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 button 2 connection	
JP12	Not managed	Not managed
JP14	Not managed	Not managed
JP15	Display function buttons enabled	Display function buttons disabled
JP16	6-button pushbutton panel enabled	4-button pushbutton panel enabled
JP17	Heating unit temp. check with external pressure switch (always on)	
JP18	Heat/temp./press. management always ON (always inserted)	
JP19	Programming via Indar	

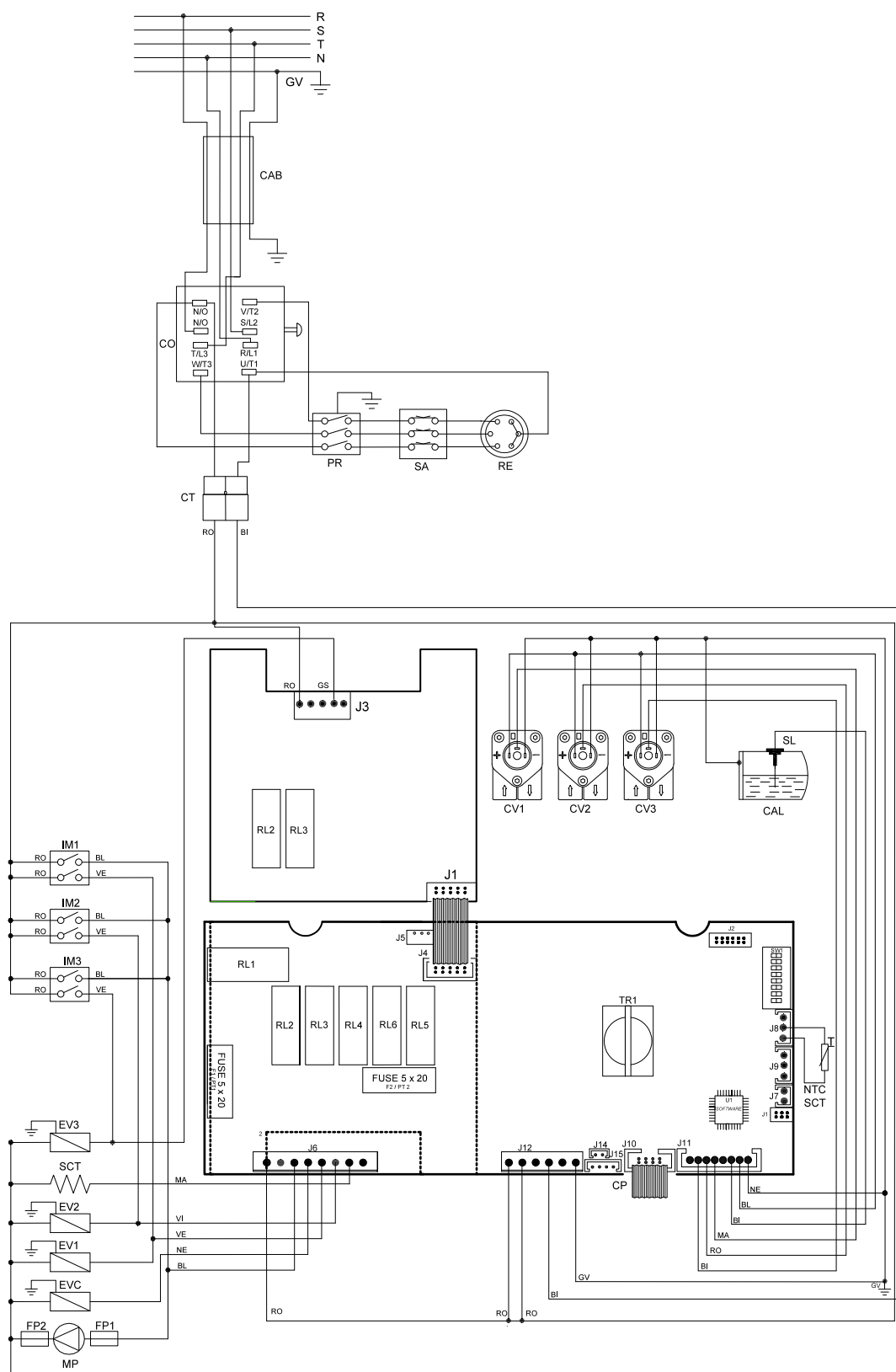
(*) Fuses for UL versions where a plug with a capacity greater than 30 A is installed

13.5.16 Wiring diagram code 18090067-18090068 *CKXE**



BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CT	Power supply connector
DV	Diverter
EVC	Heating unit 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	Heating element
RIS	Heating
RO	Red
SA	Safety heating element
SD	Reed sensor
SH	Indicator light for lack of water
SL	Heating unit level probe
SR	Heating light
TS	Safety thermostat
VE	Green

13.5.17 Wiring diagram code 18088000 - 18088001



SW	FUNCTION	SWITCH ON	SWITCH OFF	POSITION PREDEFINED
SW1	Serial transmission	Enabled	Disabled	OFF
SW2	Filling the heating unit	With pump	Without pump	ON
SW3	Dispensing hot water	With pump	Without pump	OFF
SW4	Pre-infusion	Enabled	Disabled	OFF
SW5	Keypad semi-automatic button	Enabled	Disabled	OFF
SW6	Cup warmer	Enabled	Disabled	ON
SW7	400 V Alarm	Enabled	Disabled	ON
SW8	Not managed			OFF

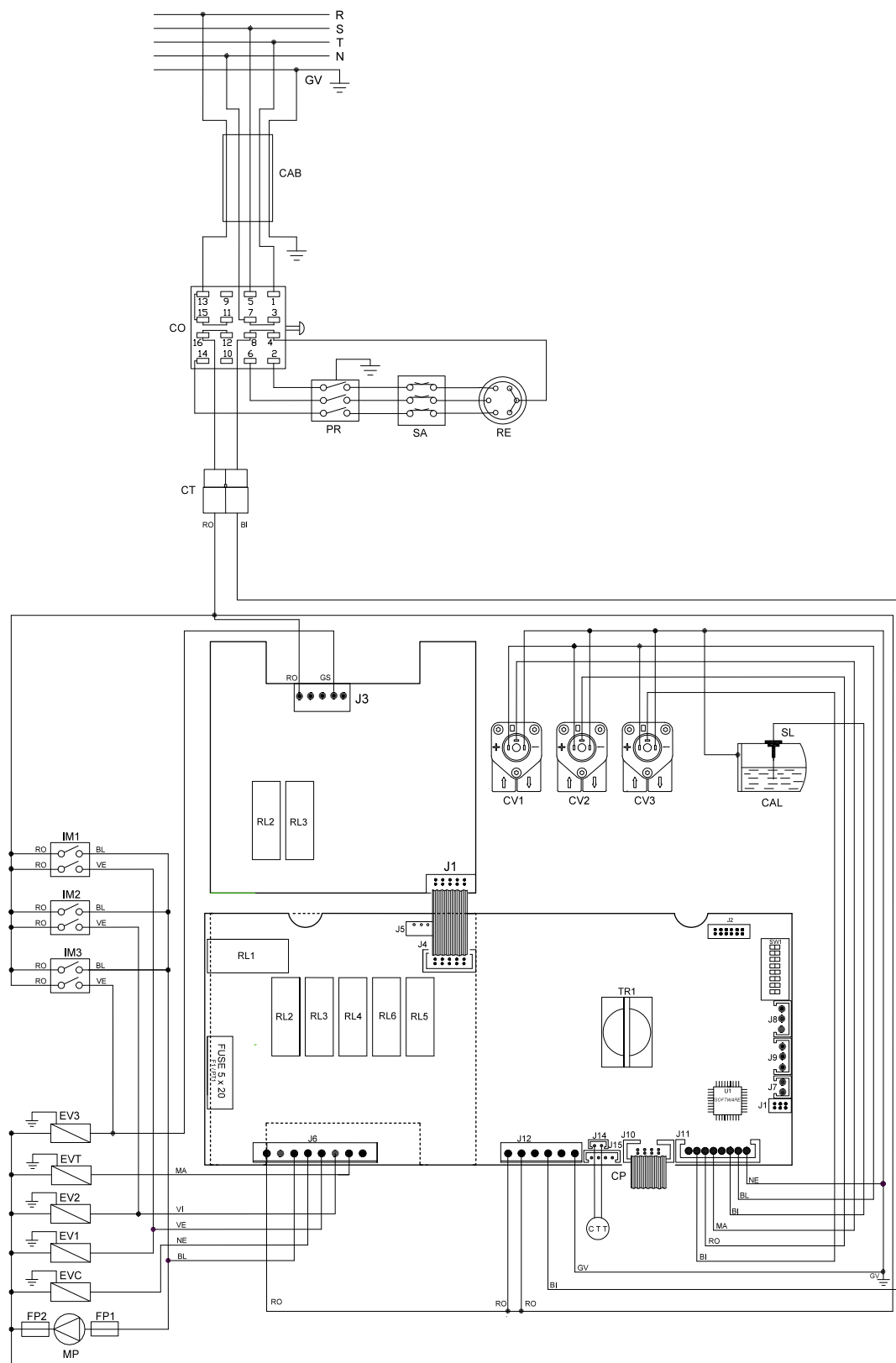
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CC	Power cable
CO	Power switch
CP	Pushbutton panel cable
CT	Power supply connector
CV1	GR1 volumetric counter
CV2	GR2 volumetric counter
CV3	GR3 volumetric counter
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Heating unit filling solenoid valve
F1	Motor pump fuse
F2	Cup warmer fuse
FP1(*)	Motor pump fuse UL (OPD) fuse
FP2(*)	230 V UL (OPD) fuse
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	Warmer connect.
PR	Pressure switch
RE	Heating element
RL1	Motor pump relay
RL2	Heating unit solenoid valve relay
RL3	GR1 solenoid valve relay
RL4	GR2 solenoid valve relay
RL5	Cup warmer relay
RL6	Remote switch relay
RO	Red
SA	Safety heating element
SCT	Cup warmer heating element
SL	Level probe
TR1	Transformer
VE	Green
VI	Violet
J1	Programm. connector
J2	RTC expansion (not used)
J4	Relay expansion (3GR used)
J5	Serial connection
J6	Service outputs
J7	Heating unit NTC (not used)
J8	Cup warmer NTC (used)
J9	Automatic steam wand NTC (not managed)
J10	Keypads
J11	Low voltage
J12	Power supply
J14	Water button (not used)
J15	Steam button (not managed)

Relay expansion board

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

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

13.5.18 Wiring diagram code 18088004 - 18088005



SW	FUNCTION	SWITCH ON	SWITCH OFF	POSITION PREDEFINED
SW1	Serial transmission	Enabled	Disabled	OFF
SW2	Filling the heating unit	With pump	Without pump	ON
SW3	Dispensing hot water	With pump	Without pump	OFF
SW4	Pre-infusion	Enabled	Disabled	OFF
SW5	Keypad semi-automatic button	Enabled	Disabled	OFF
SW6	Not managed			OFF
SW7	400 V Alarm	Enabled	Disabled	ON
SW8	Not managed			OFF

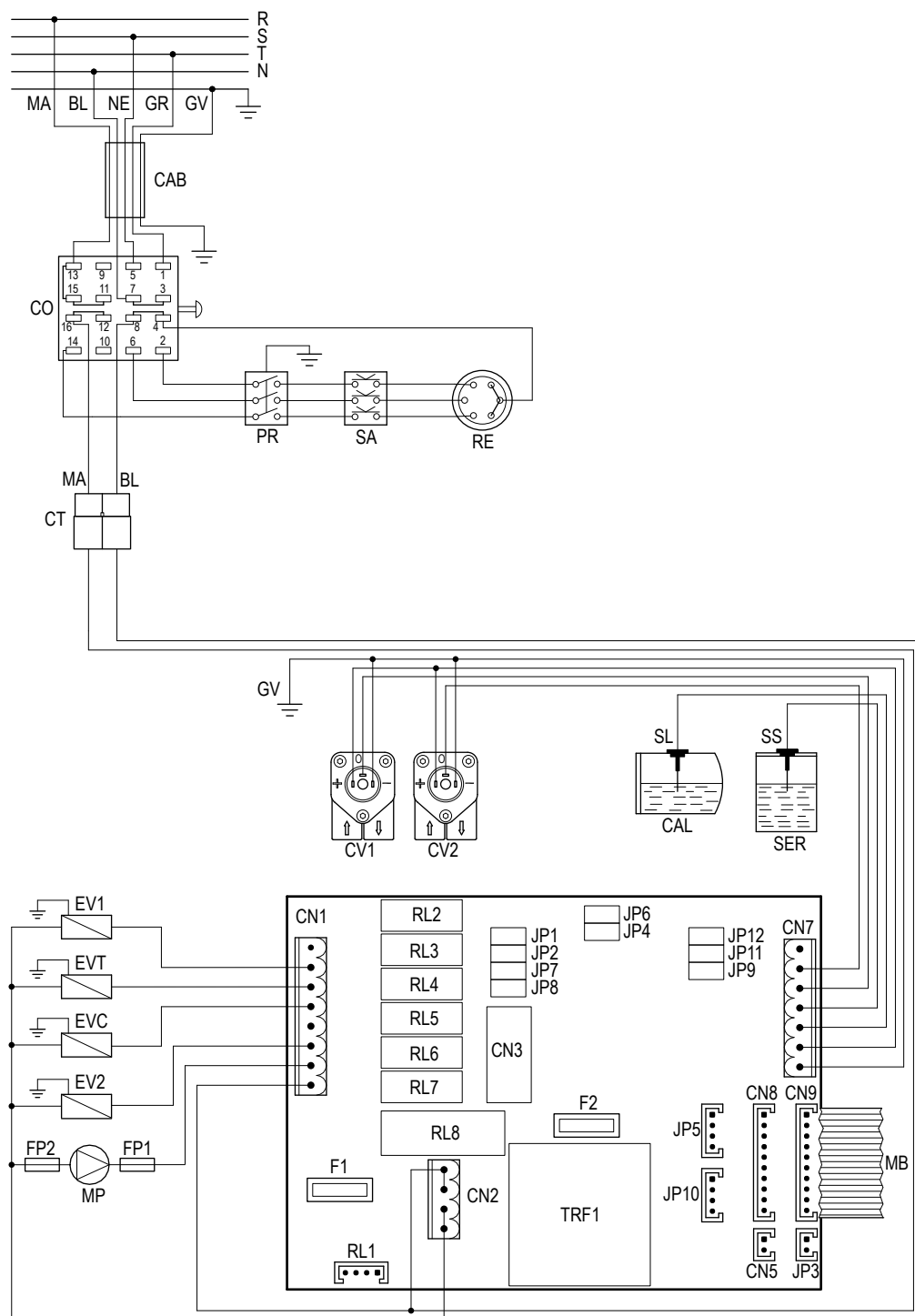
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CC	Power cable
CO	Power switch
CP	Pushbutton panel cable
CT	Power supply connector
CTT	Tea button connection
CV1	GR1 volumetric counter
CV2	GR2 volumetric counter
CV3	GR3 volumetric counter
EV1	GR1 solenoid valve
EV2	GR2 solenoid valve
EV3	GR3 solenoid valve
EVC	Heating unit filling solenoid valve
F1	Motor pump fuse
F2	Cup warmer fuse
FP1(*)	Motor pump fuse UL (OPD) fuse
FP2(*)	230 V UL (OPD) fuse
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	Warmer connect.
PR	Pressure switch
RE	Heating element
RL1	Motor pump relay
RL2	Heating unit solenoid valve relay
RL3	GR1 solenoid valve relay
RL4	GR2 solenoid valve relay
RL5	Cup warmer relay
RL6	Remote switch relay
RO	Red
SA	Safety heating element
SCT	Cup warmer heating element
SL	Level probe
TR1	Transformer
VE	Green
VI	Violet
J1	Program. connector
J2	RTC expansion (not used)
J4	Relay expansion (3GR used)
J5	Serial connection
J6	Service outputs
J7	Heating unit NTC (not used)
J8	Cup warmer NTC (used)
J9	Automatic steam wand NTC (not managed)
J10	Keypads
J11	Low voltage
J12	Power supply
J14	Water button (not used)
J15	Steam button (not managed)

Relay expansion board

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

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

13.5.19 Wiring diagram code 18090130 - 18090146



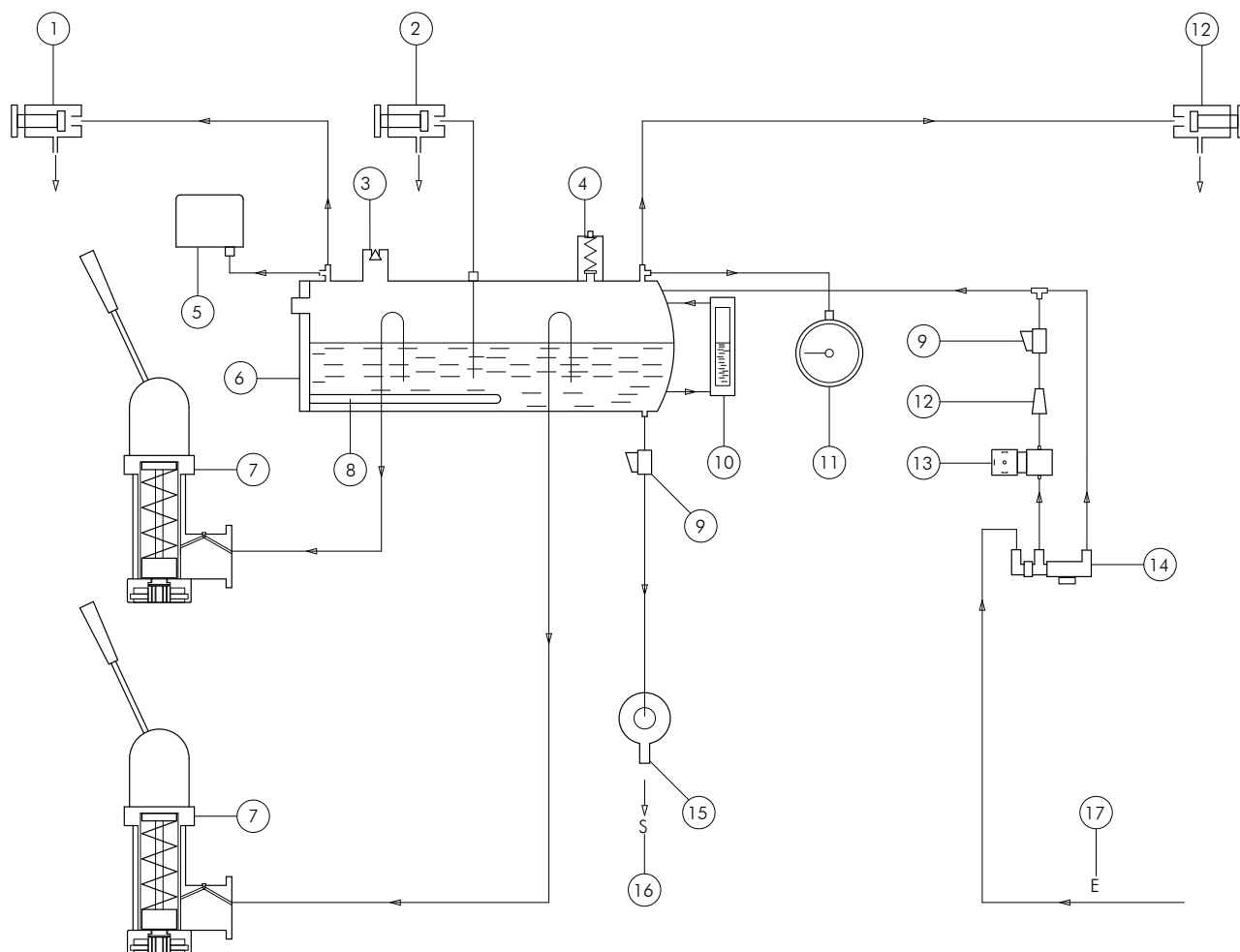
BI	White
BL	Blue
CAB	Power cable
CAL	Heating unit
CN1	Steam outlet connector
CN2	Power supply connector
CN3	Programming connector
CN5	Heating unit NTC probe
CN7	Low voltage connector
CN8	GR2 pushbutton panel connector
CN9	GR1 pushbutton panel connector
CO	Power switch
CT	Power supply connector
CV1	GR1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

MOVABLE JUMPER	INSERTED	NOT INSERTED
JP1	RS232 serial port enabled	RS232 serial port disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP4	Filling the heating unit with the pump	Filling the heating unit without the pump
JP6	Dispensing tea with the pump	Dispensing tea without the pump
JP7	Continuous function enabled	Continuous function disabled
JP8	Not used	
JP9	Temperature control enabled	Temperature control disabled
JP11	Hysteresis at 2°C	Hysteresis at 4°C
JP12	Water supply from the tank	Water supply from the mains

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

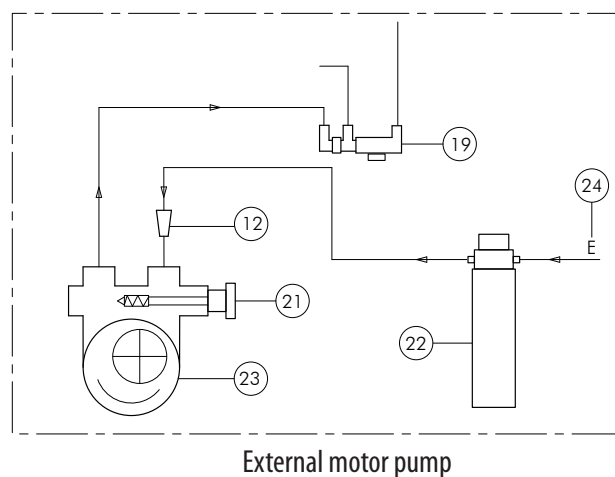
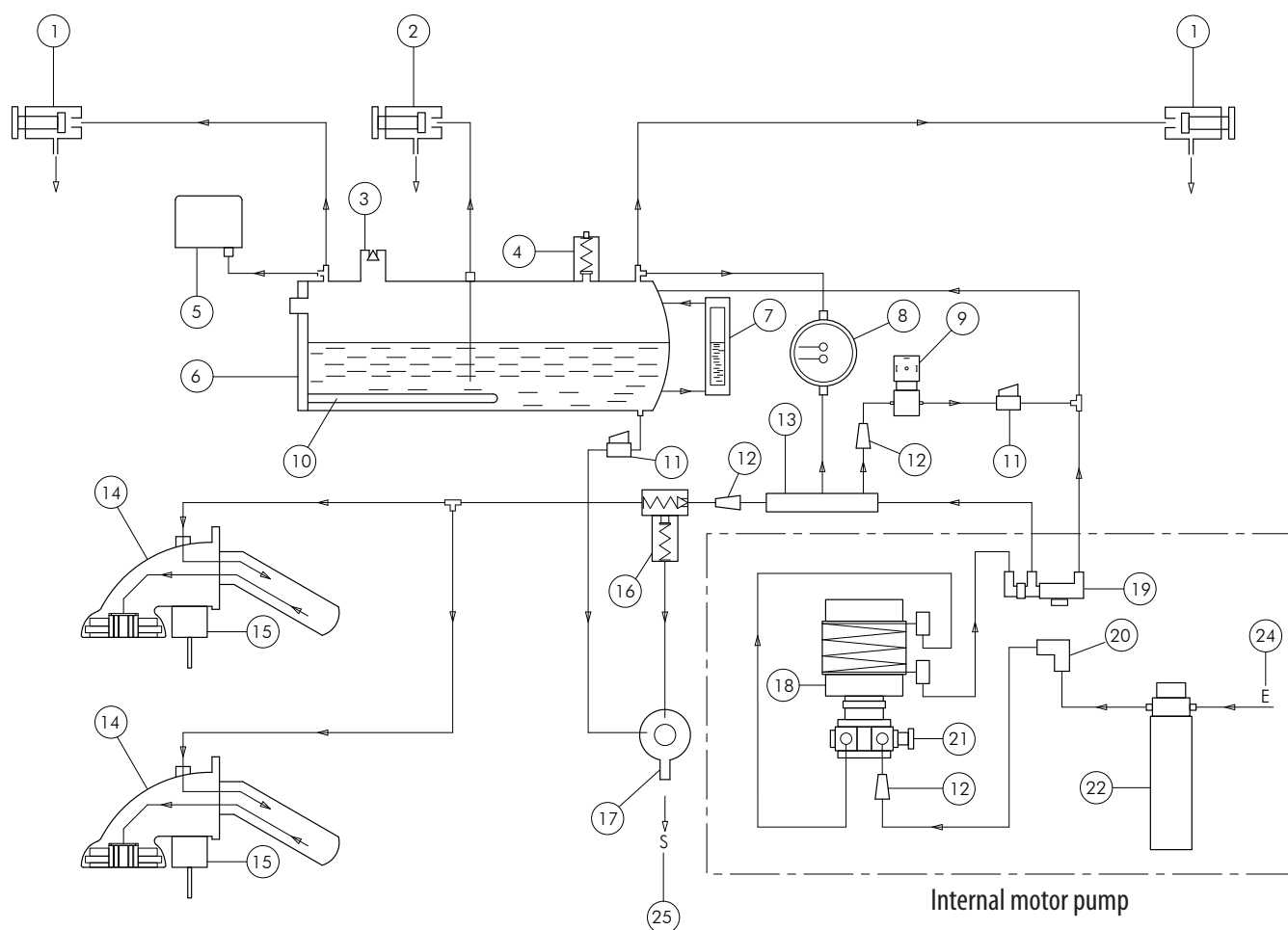
14. HYDRAULIC DIAGRAMS

14.1 LEVER GROUP hydraulic diagram



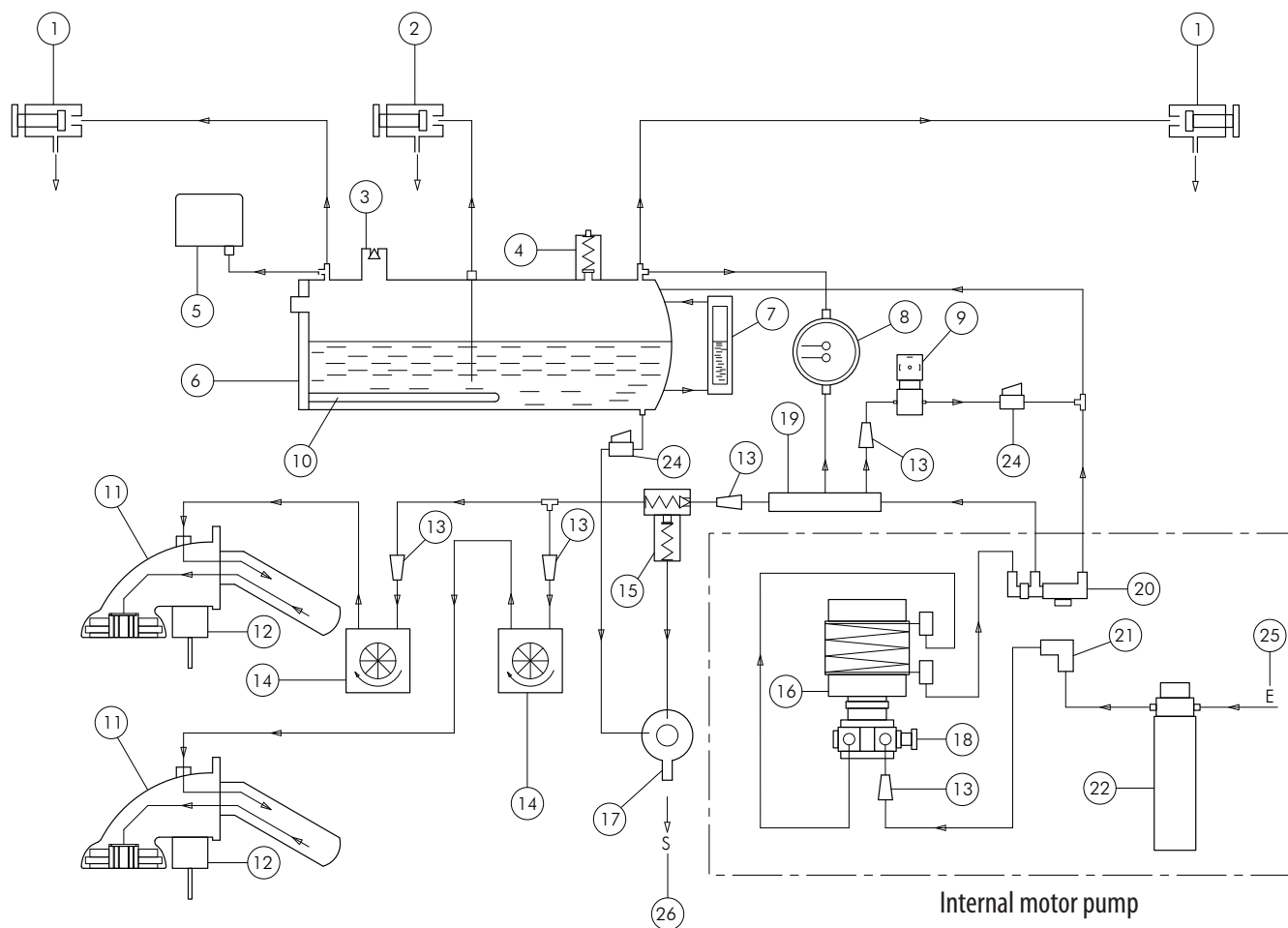
1	Steam valve
2	Hot water valve
3	Negative pressure valve
4	Safety valve
5	Pressure switch
6	Heating unit
7	Dispensing group
8	Heating unit heating element
9	Valve
10	Optical level
11	Pressure gauge
12	Water inlet filter
13	Automatic Water Entry solenoid valve (optional)
14	Manual water inlet valve
15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

14.2 AEP EXTRACTABLE EXCHANGER hydraulic diagram

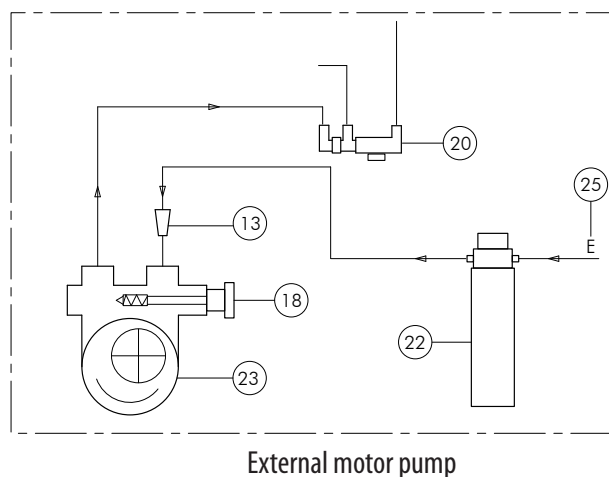


1	Steam valve
2	Hot water valve
3	Negative pressure valve
4	Safety valve
5	Pressure switch
6	Heating unit
7	Optical level
8	Pressure gauge
9	Automatic Water Entry Solenoid Valve
10	Heating unit heating element
11	Heating unit drain valve
12	Water inlet filter
13	Water dispenser
14	Dispensing group
15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

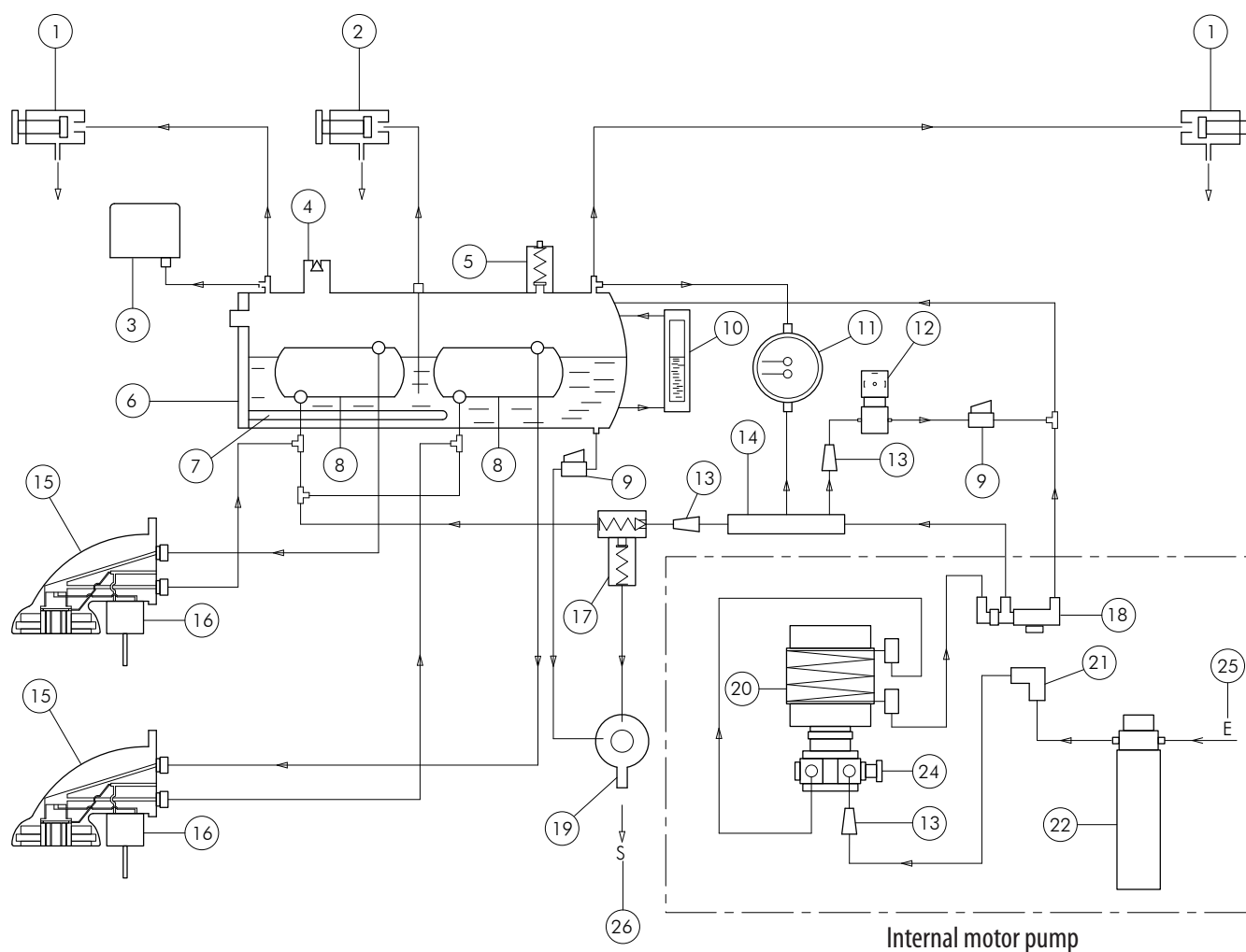
14.3 SAE EXTRACTABLE EXCHANGER hydraulic diagram



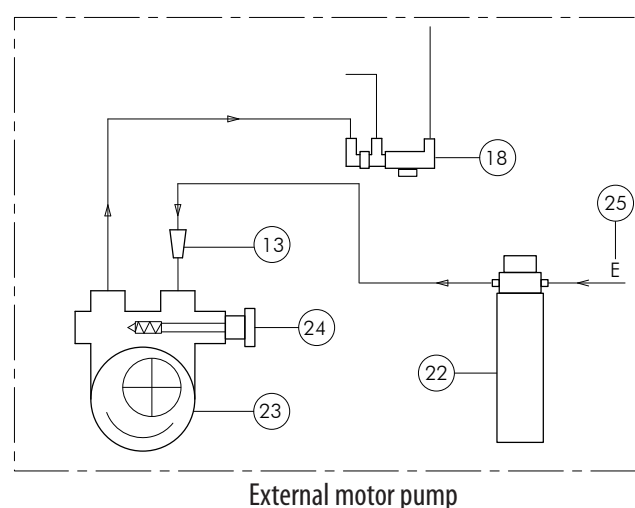
1	Steam valve
2	Hot water valve
3	Negative pressure valve
4	Safety valve
5	Pressure switch
6	Heating unit
7	Optical level
8	Pressure gauge
9	Automatic Water Entry Solenoid Valve
10	Heating unit heating element
11	Dispensing group
12	Group solenoid valve
13	Water inlet filter
14	Volumetric dosing device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



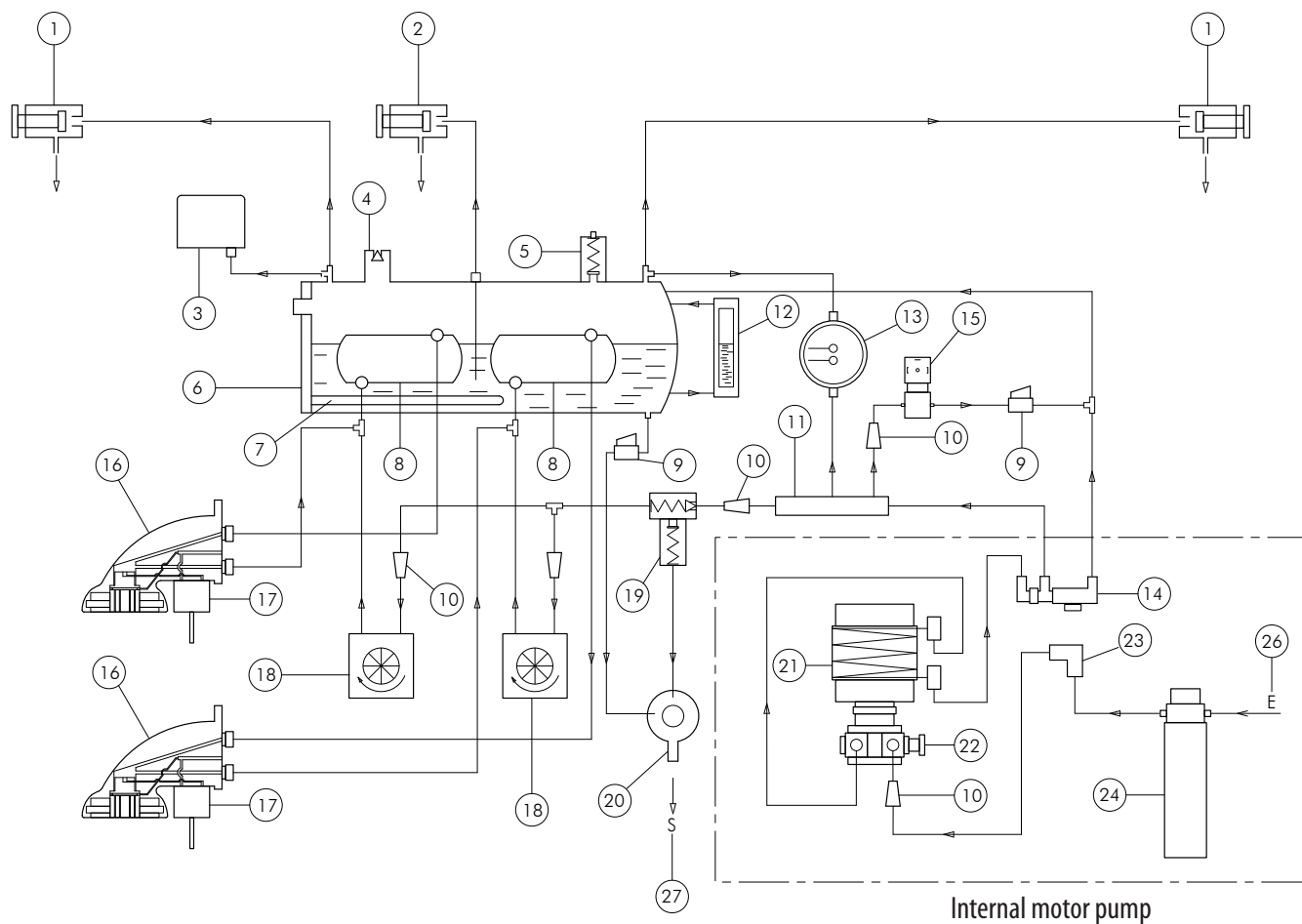
14.4 CTS SYSTEM hydraulic diagram - AEP



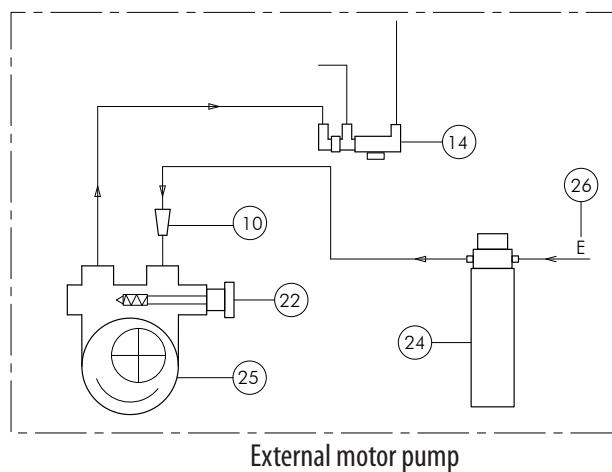
1	Steam valve
2	Hot water valve
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Heating unit
7	Heating unit heating element
8	Heat exchanger
9	Heating unit drain valve
10	Optical level
11	Pressure gauge
12	Automatic Water Entry Solenoid Valve
13	Water inlet filter
14	Water dispenser
15	Dispensing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



14.5 CTS SYSTEM hydraulic diagram - SAE



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



15. CREDIT-DEBIT and DEBIT-CREDIT SYSTEMS

15.1 CREDIT-DEBIT system

15.1.1 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 maker/automatic steam wand) with a software programme dated 20/05/05 or later.

When installing, proceed as follows:

- Turn the machine off.
- Activate the JP1 and JP9 jumpers in the control unit as indicated in the wiring diagram.
- Activate the JP12 and JP14 jumpers in the control unit as indicated in the wiring diagram.
- Connect the supplied CC cable (code 22556005) to the CN4 dedicated connector of the CE electronic board and the M signal converter (code 22556003).
- Connect via a standard CS serial cable with code 22556004 (max. 15 metres) to the M signal converter (code 22556003) and connect the other end to the till.
- Turn the machine back on.



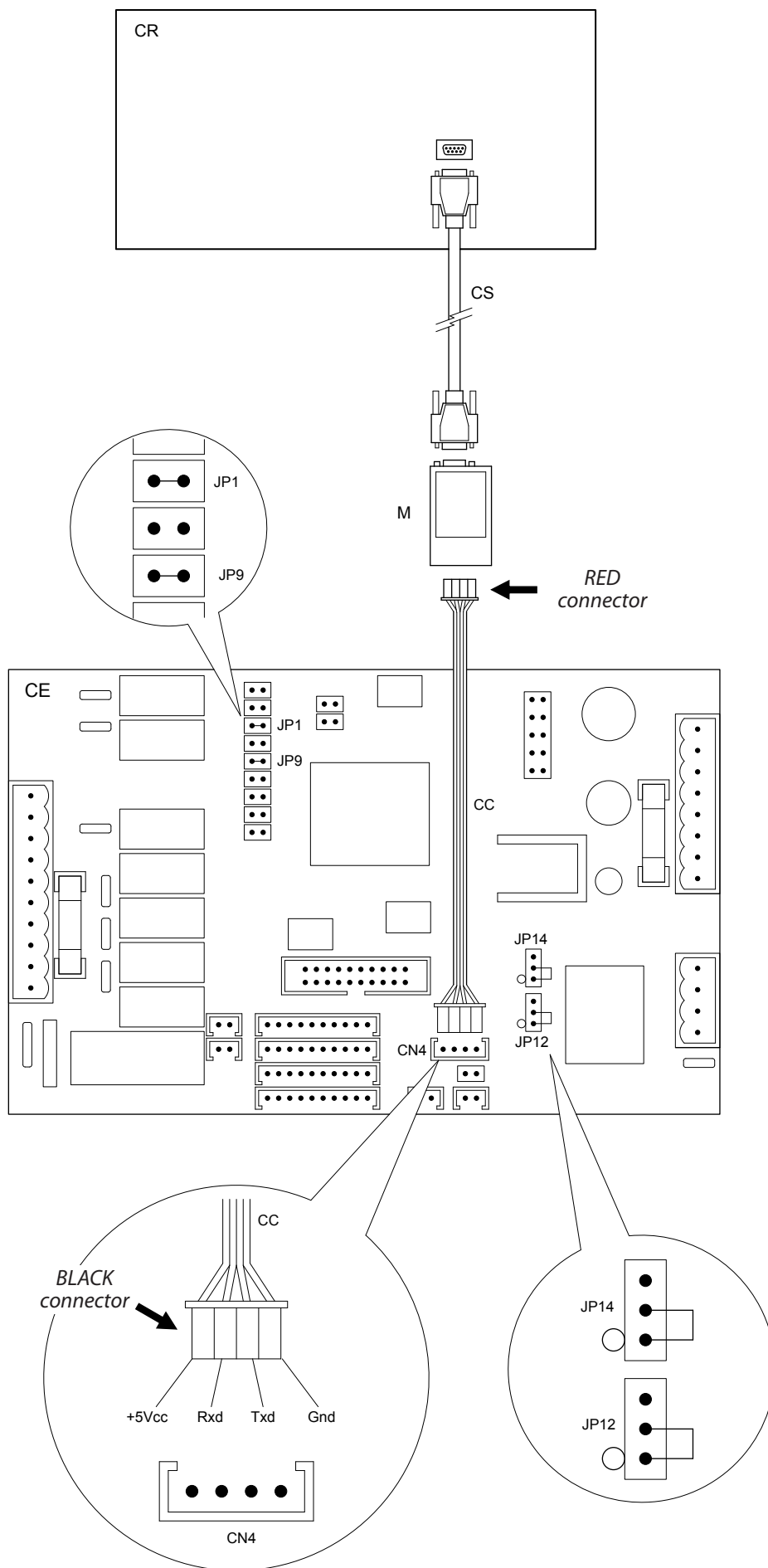
If machines have a software programme dated 23/06/04 or earlier, the control unit must be replaced.

The till management software and the standard CS serial cable (max. length: 15 metres) are not the responsibility of the manufacturer. Till response 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	Serial connection cable (supplied), code: 22556005
CS	Serial transmission cable supplied code 22556004 (max. 15 m)
CN4	Serial transmission connector
CR	Till
CE	Electronic control unit: - Plus1 code 18090047-48 - Plus2 code 18090079-80 - Plus3 code 18090051-52
M	Signal converter code 22556003



15.1.2 Communication protocol

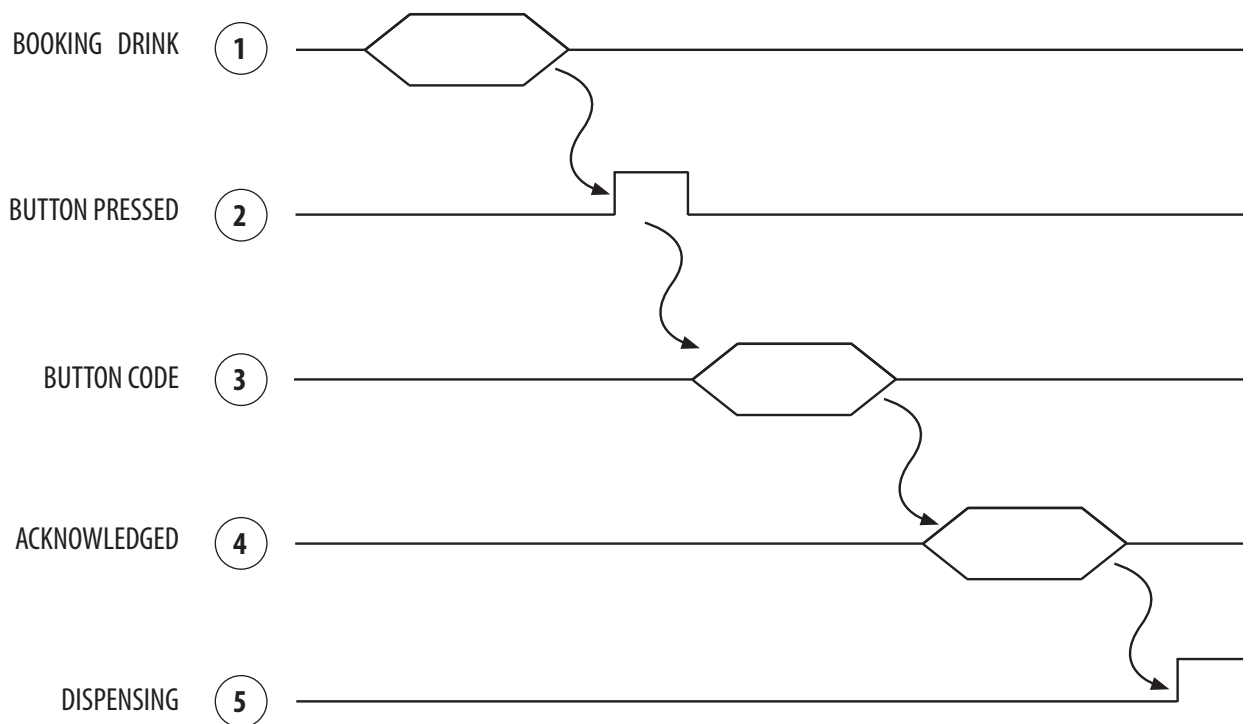
Description of the operating principle with reference to the diagram shown below:

- Order the beverage at the till.
- The till sends the reserved selection-related code to the machine.
- Select the ordered dose on the coffee machine.
- The code that corresponds to the selection is sent to the till (see the code table).
- The till replies with ACK=06H, thus enabling the beverage to be dispensed.
- The coffee machine dispenses the beverage.

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



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



15.1.3 Beverage selection code table

DESCRIPTION	SIGNAL	RELAY	I/O CONNECTOR REF.
1 GR1 Espresso	011 h	1	CN7-1
1 GR1 Medium	012 h	2	CN7-2
1 GR1 Large	013 h	3	CN7-3
2 GR1 Espressos	014 h	4	CN7-4
2 GR1 Medium	015 h	5	CN7-5
2 GR1 Large	016 h	6	CN7-6
1 GR2 Espresso	021 h	7	CN7-7
1 GR2 Medium	022 h	8	CN7-8
1 GR2 Large	023 h	9	CN7-9
2 GR2 Espressos	024 h	10	CN7-10
2 GR2 Medium	025 h	11	CN7-11
2 GR2 Large	026 h	12	CN7-12
1 GR3 Espresso	031 h	13	CN7-13
1 GR3 Medium	032 h	14	CN7-14
1 GR3 Large	033 h	15	CN7-15
2 GR3 Espressos	034 h	16	CN7-16
2 GR3 Medium	035 h	17	CN7-17
2 GR3 Large	036 h	18	CN7-18
1 GR4 Espresso / Cappuccino	041 h	19	CN7-19
1 GR4 Medium / Latte	042 h	20	CN7-20
1 GR4 Large / Frothed milk	043 h	21	CN7-21
2 GR4 Espressos / Warm milk	044 h	22	CN7-22
2 GR4 Medium / Latte Macchiato	045 h	23	CN7-23
2 GR4 Large	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

15.2 DEBIT - CREDIT system with direct connection to the TILL

15.2.1 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 maker/automatic steam wand) with a software programme dated 20/05/05 or later.

When installing, proceed as follows:

- Turn the machine off.
- Activate the JP1 jumpers in the control unit as indicated in the wiring diagram.
- Activate the JP12 and JP14 jumpers in the control unit as indicated in the wiring diagram.
- Connect the supplied CC cable (code 22556005) to the CN4 dedicated connector of the CE electronic board and the M signal converter (code 22556003).
- Connect via a standard CS serial cable with code 22556004 (max. 15 metres) to the M signal converter (code 22556003) and connect the other end to the till.
- Turn the machine back on.



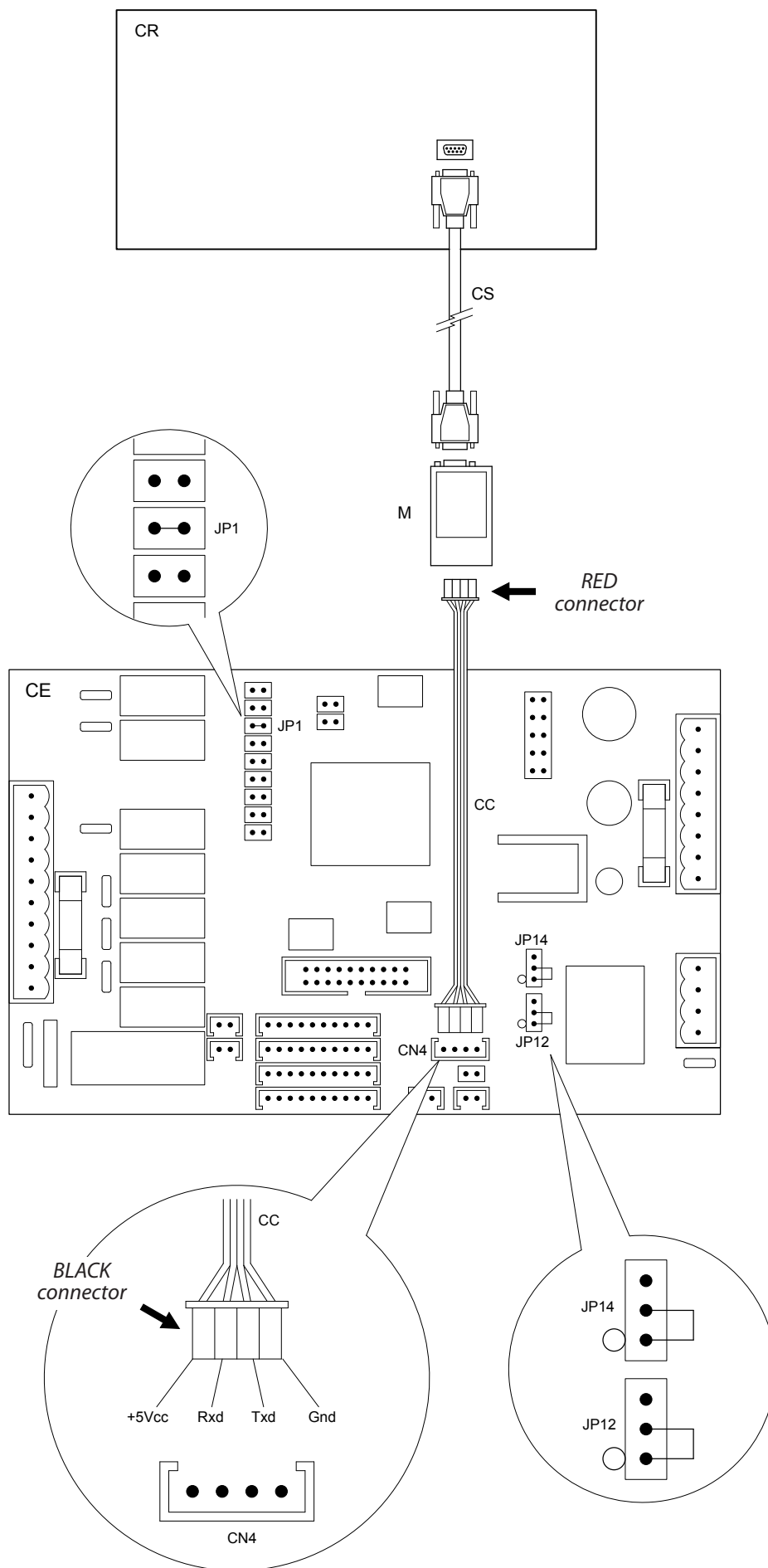
If machines have a software programme dated 23/06/04 or earlier, the control unit must be replaced.

The till management software and the standard CS serial cable (max. length: 15 metres) are not the responsibility of the manufacturer. Till response timeout: 1 second.

Doses can be programmed without having to disconnect the Debit-Credit device.

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

CC	Serial connection cable (supplied), code: 22556005
CS	Serial transmission cable supplied code 22556004 (max. 15 m)
CN4	Serial transmission connector
CR	Till
CE	Electronic control unit: - Plus1 code 18090047-48 - Plus2 code 18090079-80 - Plus3 code 18090051-52
M	Signal converter code 22556003



15.2.2 Communication protocol

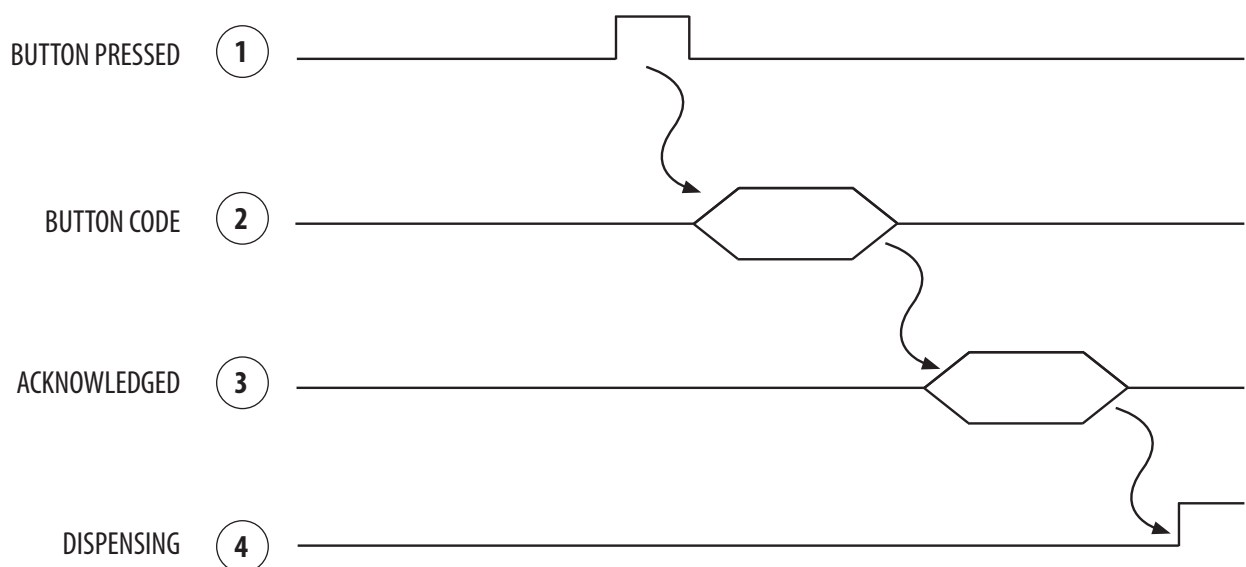
Description of the operating principle with reference to the diagram shown below:

- Select the desired dose on the coffee machine.
- The code that corresponds to the selection is sent to the till (see the code table).
- The till replies with ACK=1H, thus enabling the beverage to be dispensed.
- The coffee machine dispenses the beverage.
- The till system registers the dispensed beverage.

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



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



15.2.3 Beverage selection code table

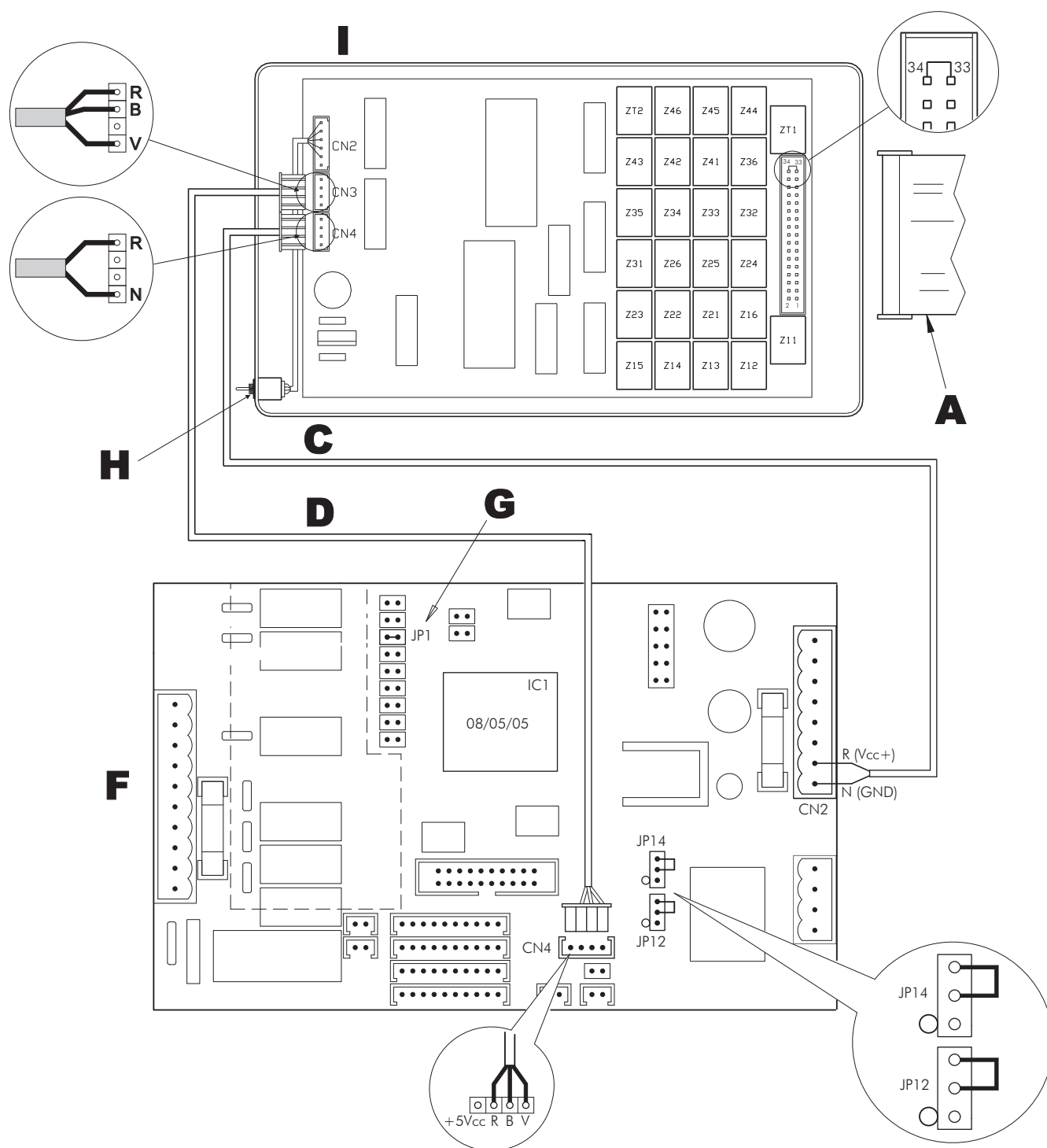
DESCRIPTION	SIGNAL	RELAY	I/O CONNECTOR REF.
1 GR1 Espresso	011 h	1	CN7-1
1 GR1 Medium	012 h	2	CN7-2
1 GR1 Large	013 h	3	CN7-3
2 GR1 Espressos	014 h	4	CN7-4
2 GR1 Medium	015 h	5	CN7-5
2 GR1 Large	016 h	6	CN7-6
1 GR2 Espresso	021 h	7	CN7-7
1 GR2 Medium	022 h	8	CN7-8
1 GR2 Large	023 h	9	CN7-9
2 GR2 Espressos	024 h	10	CN7-10
2 GR2 Medium	025 h	11	CN7-11
2 GR2 Large	026 h	12	CN7-12
1 GR3 Espresso	031 h	13	CN7-13
1 GR3 Medium	032 h	14	CN7-14
1 GR3 Large	033 h	15	CN7-15
2 GR3 Espressos	034 h	16	CN7-16
2 GR3 Medium	035 h	17	CN7-17
2 GR3 Large	036 h	18	CN7-18
1 GR4 Espresso / Cappuccino	041 h	19	CN7-19
1 GR4 Medium / Latte	042 h	20	CN7-20
1 GR4 Large / Frothed milk	043 h	21	CN7-21
2 GR4 Espressos / Warm milk	044 h	22	CN7-22
2 GR4 Medium / Latte Macchiato	045 h	23	CN7-23
2 GR4 Large	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

15.3 DEBIT - CREDIT SYSTEM with connection to the INTERFACE

15.3.1 Beverage selection code table

PIN	RELAY	GROUP	DOSE BUTTON
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	Common HTW signals		
30	Common HTW signals		
31			
32			
33			ABHART*
34			GND*

15.3.2 PLUS 1-2 type (GIEMME type) system



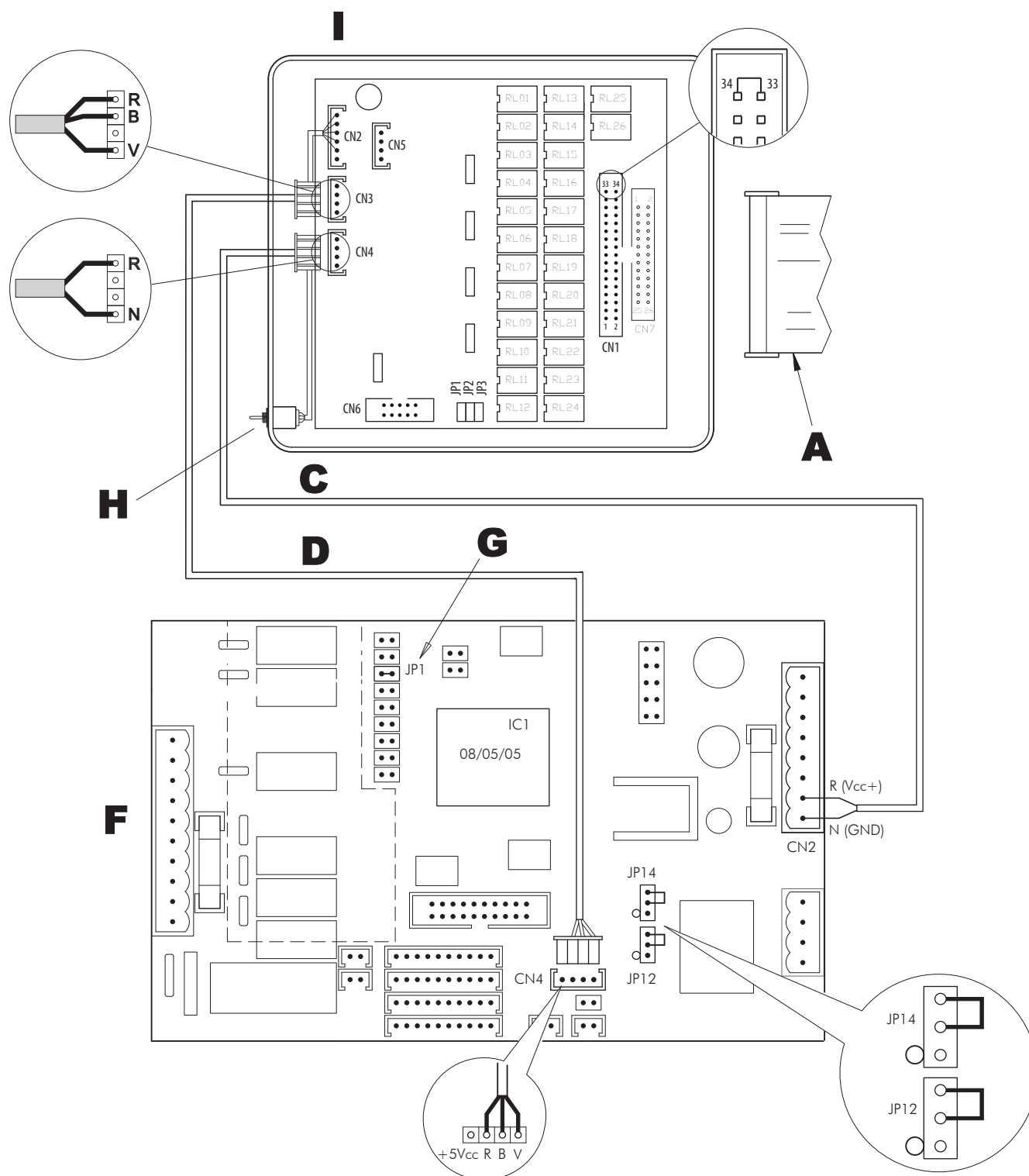
Components to be used for the INTERFACE - COFFEE MACHINE connection:

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



Interface kit code **WY83260002R**.

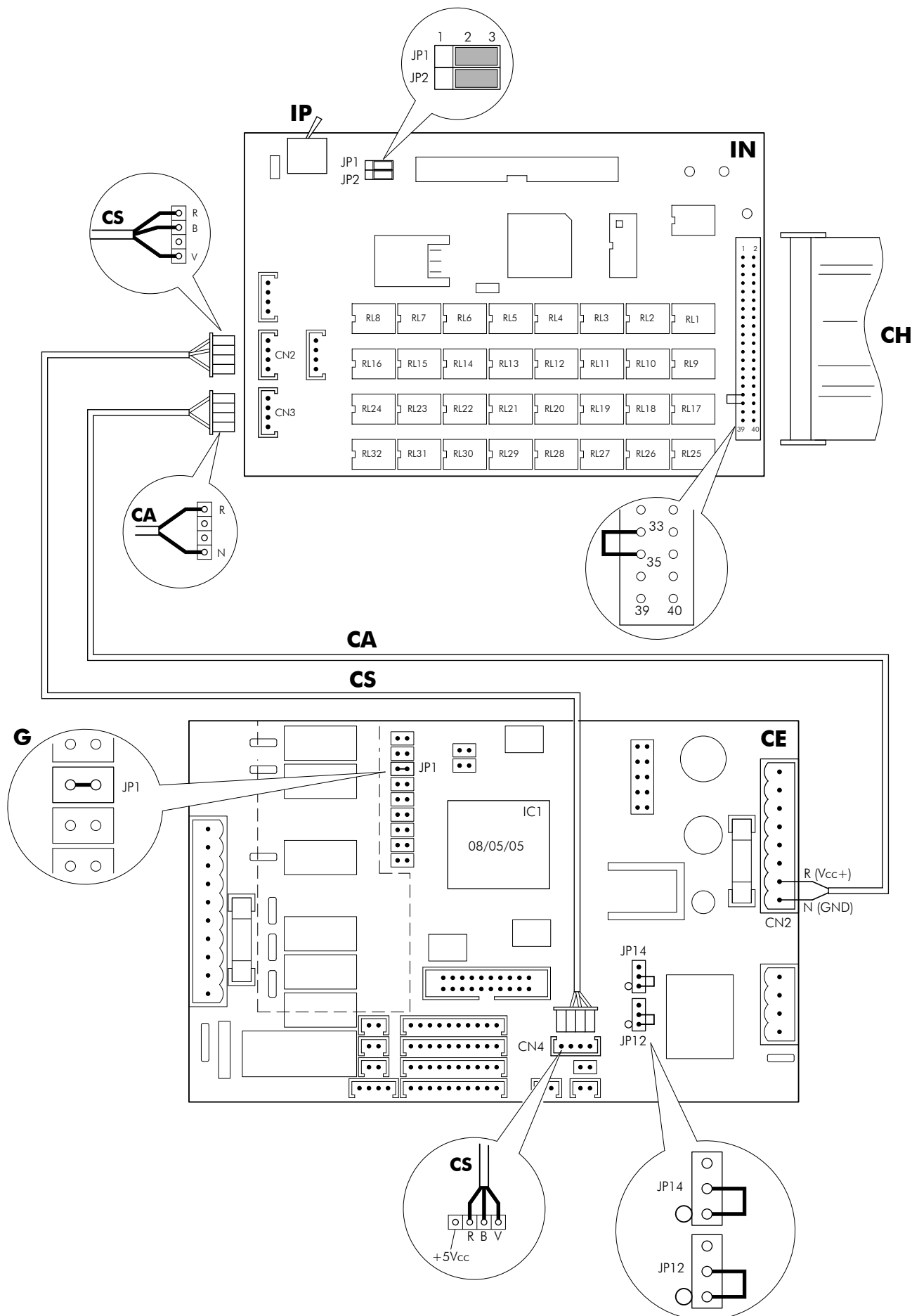
15.3.3 PLUS 1-2 (GICAR type) system



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	JP1 short circuit

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

15.3.4 PLUS 3 type system



Components to be used for 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 code WY83260002R.

REF.	DESCRIPTION
IN	32-relay interface code 26016
CE	Electronic control unit PLUS 3 code 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	JP1 short circuit
IP	Programming switch: Never move the lever to 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	I/O CONNECTOR REF.
1 GR1 Espresso	1	CN7-1
1 GR1 Medium	2	CN7-2
1 GR1 Large	3	CN7-3
2 GR1 Espressos	4	CN7-4
2 GR1 Medium	5	CN7-5
2 GR1 Large	6	CN7-6
1 GR2 Espresso	7	CN7-7
1 GR2 Medium	8	CN7-8
1 GR2 Large	9	CN7-9
2 GR2 Espressos	10	CN7-10
2 GR2 Medium	11	CN7-11
2 GR2 Large	12	CN7-12
1 GR3 Espresso	13	CN7-13
1 GR3 Medium	14	CN7-14
1 GR3 Large	15	CN7-15
2 GR3 Espressos	16	CN7-16
2 GR3 Medium	17	CN7-17
2 GR3 Large	18	CN7-18
1 GR4 Espresso / Cappuccino	19	CN7-19
1 GR4 Medium / Latte	20	CN7-20
1 GR4 Large / Frothed milk	21	CN7-21
2 GR4 Espressos / Warm milk	22	CN7-22
2 GR4 Medium / Latte Macchiato	23	CN7-23
2 GR4 Large	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



CMA MACCHINE PER CAFFÈ S.R.L.

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