Core600

AL
AEP
SAE
DISPLAY

EN **ESPRESSO COFFEE MACHINE**

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

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 is in operation.
- Do not immerse the machine in water.
- Do not spill liquids on 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.

It is the task of the Technician to 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 CO_2 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 CO_2 fire extinguisher.

Sommario generale

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 (indicated 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.

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 support service

ASTORIA MACCHINE PER CAFFÈ S.R.L.
Via Condotti Bardini, 1
31058 SUSEGANA (TV) - ITALY
Tel. +39.0438.6615 - Fax +39.0438.60657
E-mail: service@astoria.com
Web-site: www.astoria.com

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, in addition to those that do not endanger the safety of users or 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.

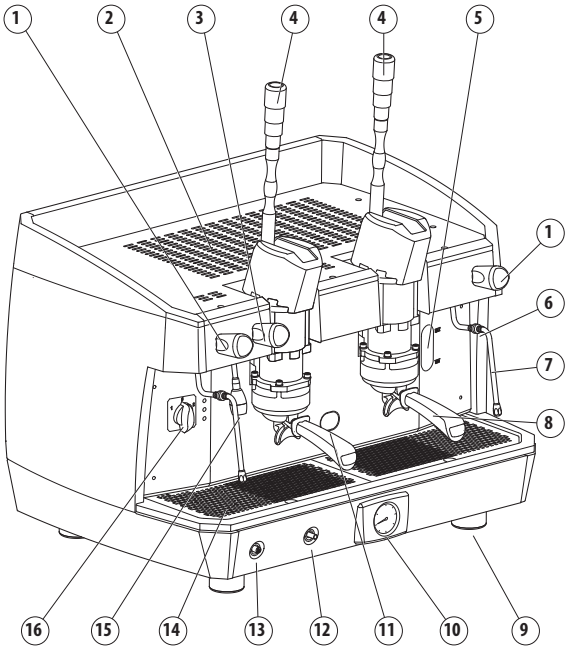
2.5 Machine diagram

1. Steam knob
2. Cup warmer shelf
3. Hot water knob
4. Group lever
5. Heating unit water level window
6. Scald protection
7. Steam nozzle
8. Filter holder
9. Adjustable foot
10. Pressure gauge
11. Gas burner inspection window (*)
12. Gas safety (*)
13. Gas ignition button (*)
14. Cup holder grille
15. Hot water nozzle
16. Power switch
17. Manual dispensing button
18. Pushbutton panel
19. Display
20. USB socket (for software updates only)
21. ON-OFF warning light/ heating unit/ cup warmer
22. Raised cup grille
23. ON switch
24. Automatic steam wand nozzle (*)
25. Blind filter
26. Tamper
27. Cleaning brush

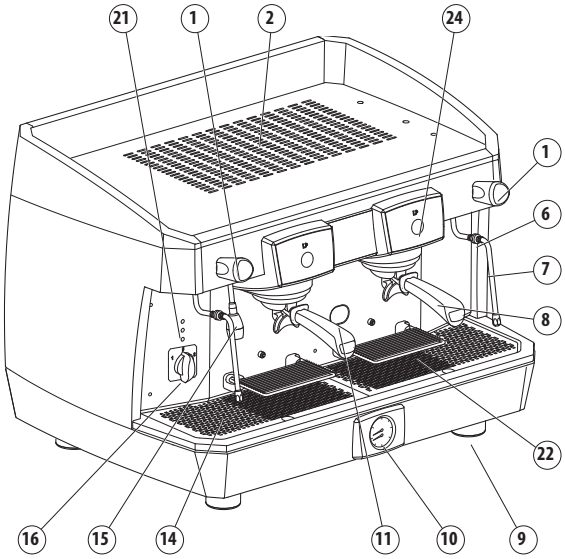
(*) *Optional device*

The only stick that can be used in the USB port (20) is the USB stick provided exclusively to the Maintenance Technician. Do not connect external devices (iPhones, iPads, PCs, etc.) to the USB port because it could create serious machine software problems.

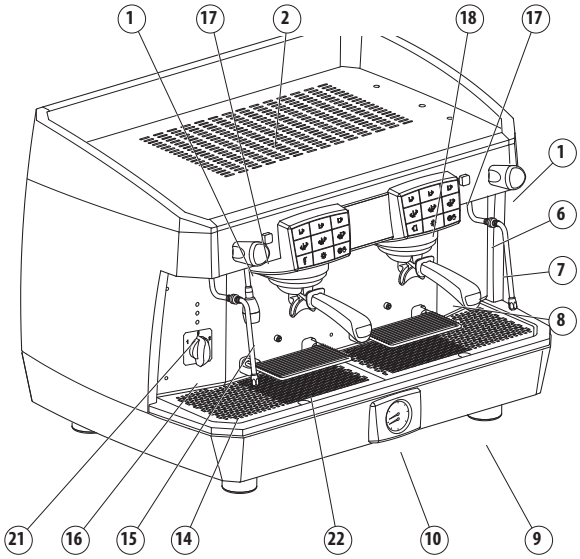
AL version



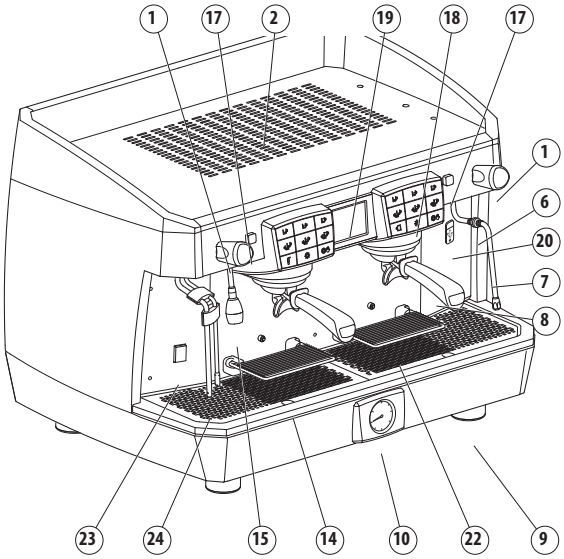
AEP version

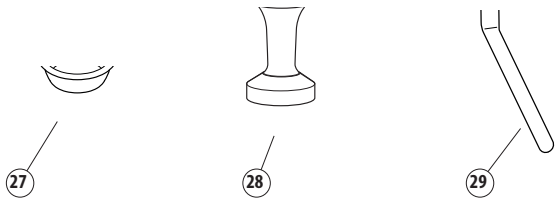


SAE version

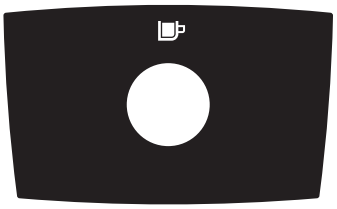


SAE - DISPLAY version



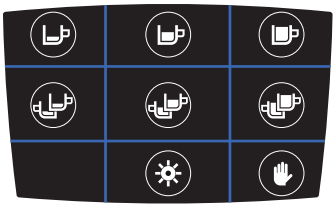


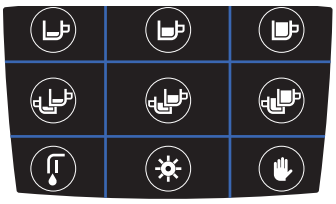
2.6 Pushbutton panels for the AEP version



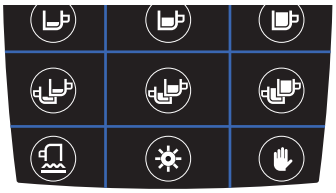
2.7 Pushbutton panels for the SAE version

1 GR ver.
COMPACT ver.





1



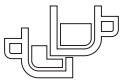
2

1 espresso

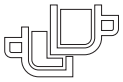
1 medium coffee

1 long coffee

2 espressos



2 medium coffees



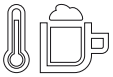
2 long coffees

1 - Work surface lighting
2 - Cup warmer lighting

Hot water

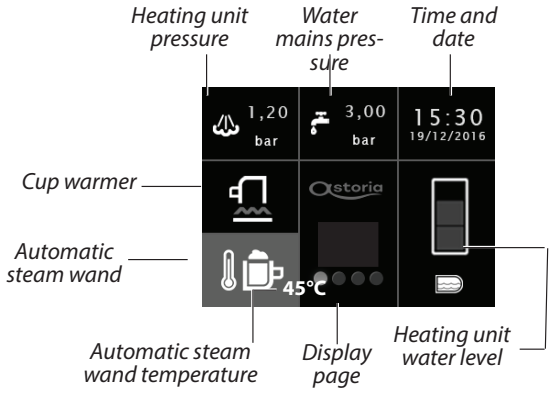
Cup warmer

Stop / Programming
Continuous dispensing



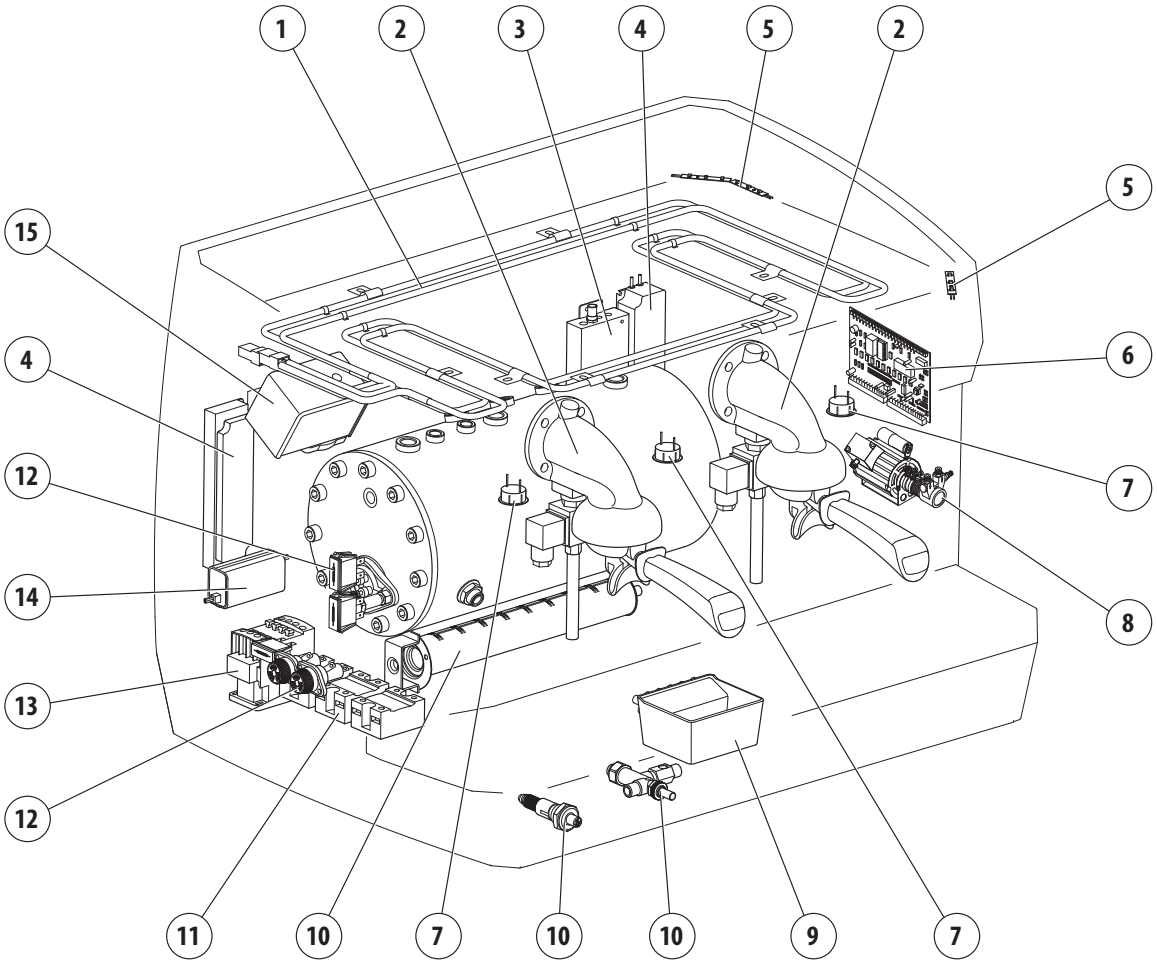
Automatic steam wand (optional)

2.8 Display



2.9 Internal components

1. Cup warmer heating element
2. Dispensing group
3. Electronic control unit
4. Side LED power supply
5. Side LEDs
6. Electronic control unit
7. Work surface LED
8. Motor pump
9. Drain tray
10. Gas system
11. Static relay
12. Fuses
13. Remote switch
14. Work surface LED power supply
15. Pressure switch

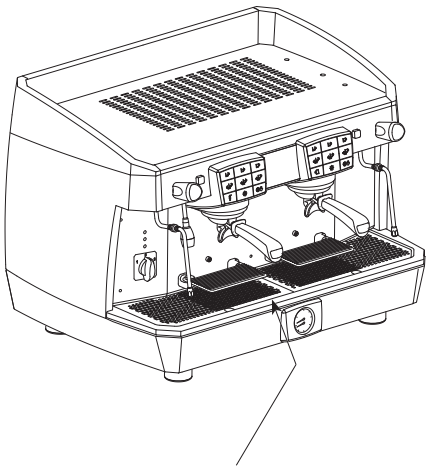


2.10 Data and marking

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

TECHNICAL DATA TABLE		1GR	COMPR.	2GR	3GR	4GR
120 V	Power	2200 W	2900 W	3100 W	---	---
220-240 V		2700-3100 W	2900-3100 W	3100-4900 W	5100-6850 W	5800-6900 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 L	7 L	9-10.6 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				

Conforming to directive 2006/42/CE, the machine is marked with the CE code with which the manufacturer states 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.

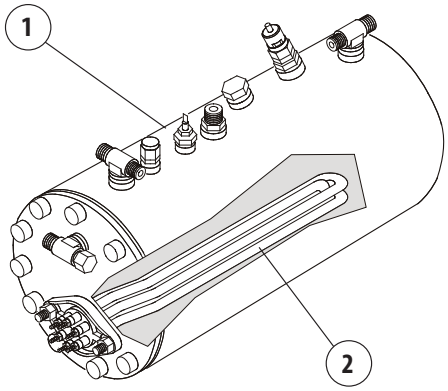
The appliance data can also be found on the label located on the machine's packaging.

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. "14. WIRING DIAGRAMS" on page 77.

2.10.1 *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

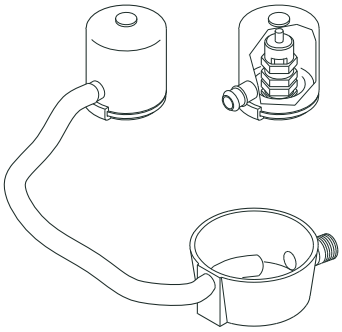
Gas heating is obtained by feeding the burner flame which is located under the heating unit.

Electric + gas heating

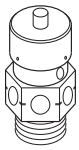
In machines equipped with both systems, it is possible to combine the two heating types.

2.10.2 *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.



2.10.3 *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. "8. MAINTENANCE AND CLEANING" on page 60.

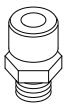
Two safety valves are installed on all machines with 4 groups.

2.10.4 *Expansion valve + check valve*

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

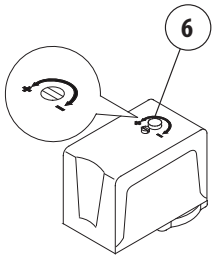
- **Expansion valve (A):** the cold water sent from the pump to the heat exchangers is heated. This heating causes an increase in the volume of water. To limit pressure increases in the hydraulic circuit, the valve limits the maximum internal pressure of the circuit to 1.2 MPa (12 bar).
- **Check valve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

2.10.5 *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.

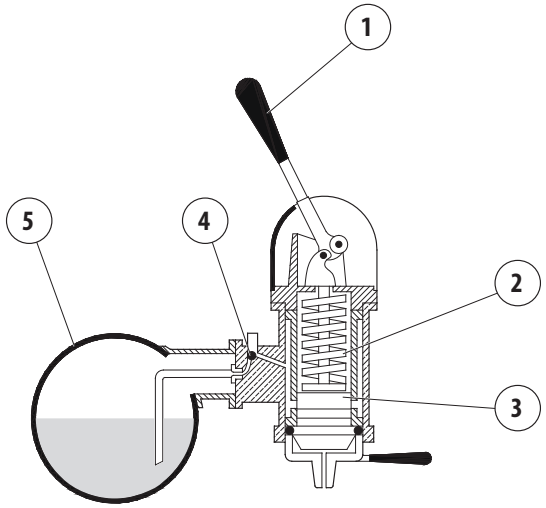
2.10.6 *Pressure switch*

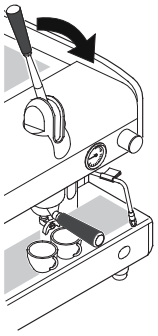


The pressure switch makes it possible to control the heating unit pressure by activating or bypassing the heating element in the heating unit. Any pressure switch calibration can be carried out with the machine in operation by turning the screw (**6**) located on the body of the component.

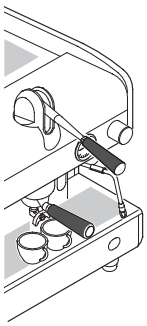
2.10.7 *LEVER group*

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**).

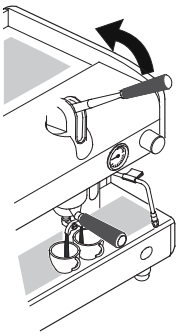




PHASE 1
Lowering the lever



PHASE 2
Pre-infusion for 3-5 seconds



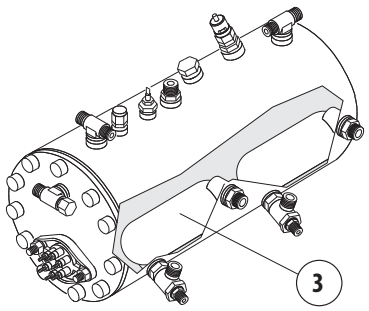
PHASE 3
The lever releases and coffee is dispensed.

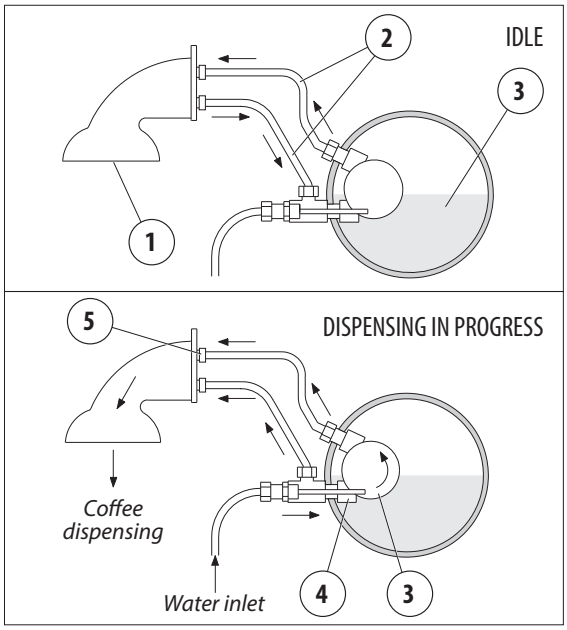
2.10.8 *CTS group (with a thermosiphonic circuit)*

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.

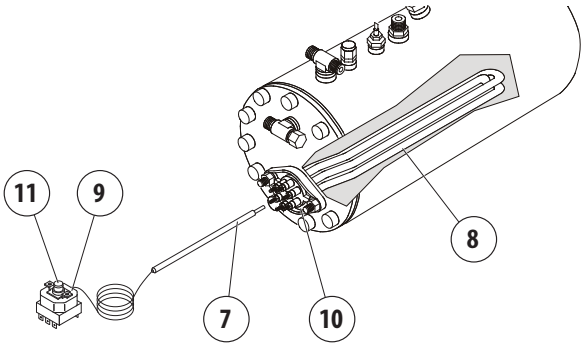
The injector (**4**) and the flow reducer (**5**) are important components for the dispensing group's operation. To increase the coffee extraction temperature, remove the flow reducer (**5**) or replace it with one that has a bigger diameter. To decrease the temperature, replace it with one that has 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.





2.10.9 *Safety thermostat*

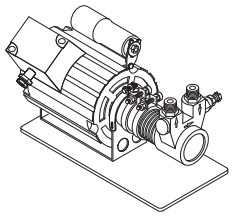
The thermostat prevents any damage occurring to the electrical heating element if there is no water in the heating unit. The thermostat bulb (**7**) is located inside a sheath (**8**) in the middle of the heating elements. The thermostat contacts (**9**) are connected to the electric heating element (**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.

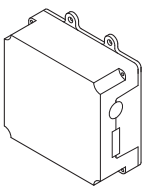
2.10.10 *Motor pump*

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.



2.10.11 *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.

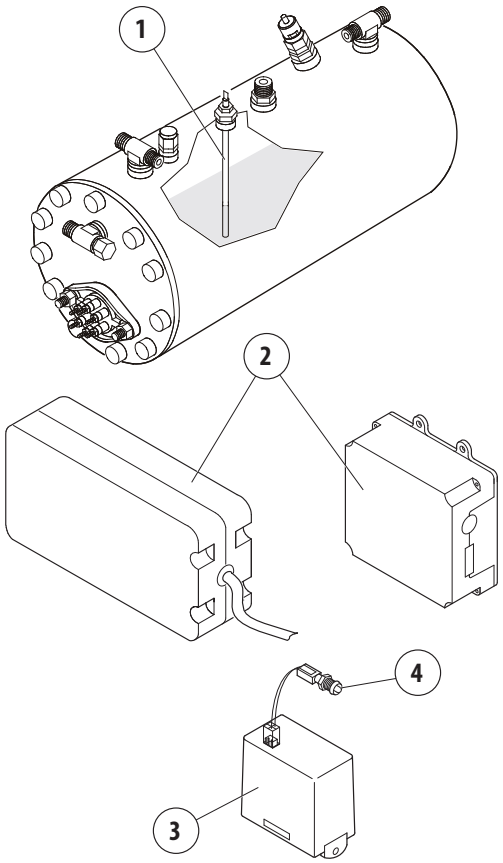


2.10.12 *Automatic Water Entry*

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

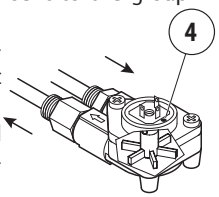
- A probe inserted into the heating unit (**1**) consisting of a stainless steel rod.
- The standard control unit (**2**) on SAE versions and the electronic level regulator on the other versions (**3**).
- A hydraulic circuit with a solenoid valve controlled by the regulator.

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.



2.10.13 *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.

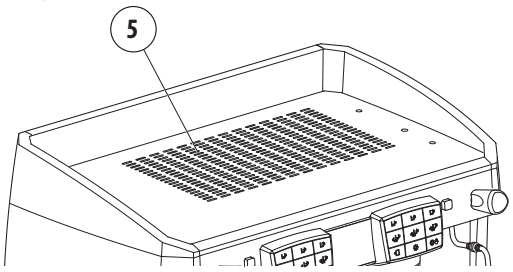


2.10.14 *Electronic pushbutton panels*

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.

2.10.15 *Cup warmer*

The cup warmer device (**5**) 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.



2.10.16 *Hot water spout*

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

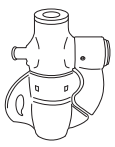
- Manually: by turning the adjustment knob on the front of the machine.
- Automatically: by selecting a button connected to a solenoid valve.

2.10.17 *Steam nozzle*

The steam nozzle is connected to the top of the heating unit. Adjust the dispensing setting by turning the knob on the front of the machine.

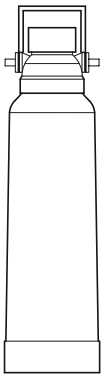
2.10.18 *Cappuccino maker (optional)*

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.



2.10.19 *Water filter*

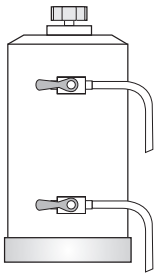
In the mains water, non-soluble salts are present which cause limestone to form in the heating unit and other parts of the machine.
Drinking water can also contain heavy metals and substances, such as chlorine which are harmful to health.
The filter makes it possible to eliminate or substantially reduce 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. "8.4 Water Filter Maintenance" on page 64.

2.10.20 *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.).

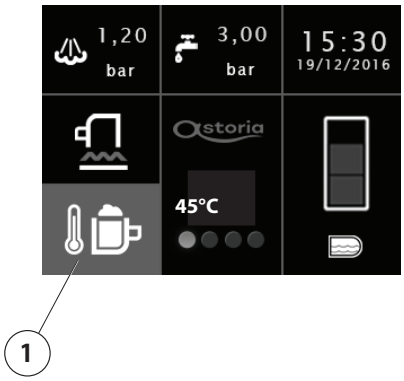


To use and regenerate the water softener, follow the instructions provided in para. "8.5 Softener regeneration" on page 66.

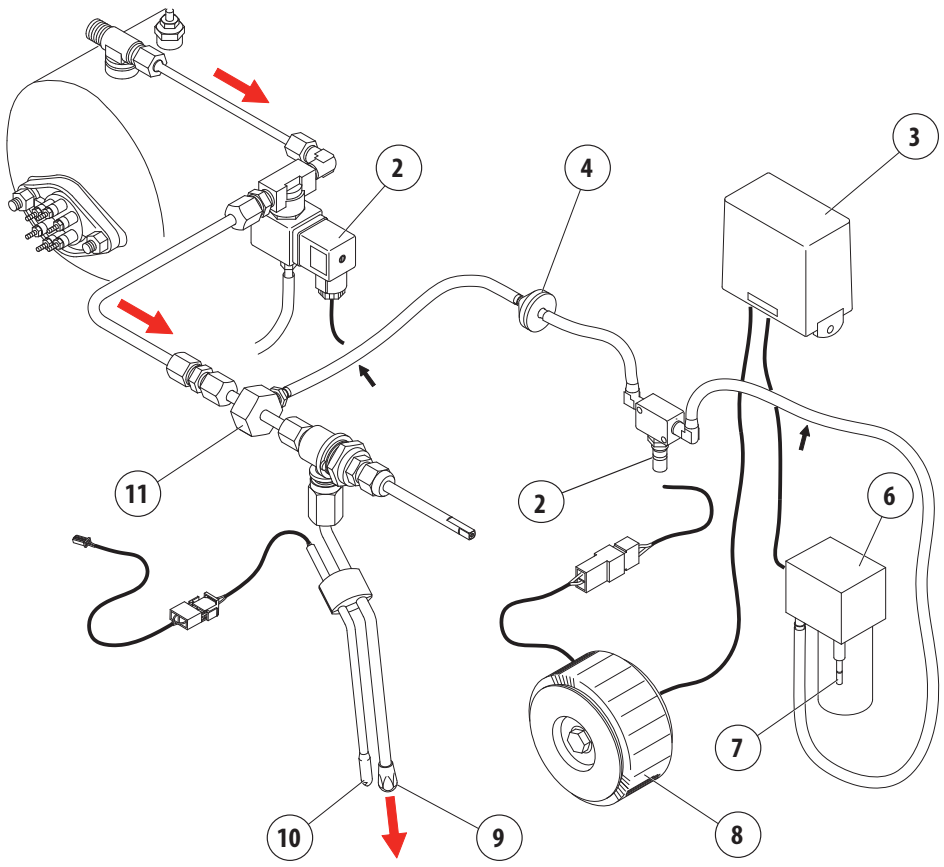
2.10.21 *Automatic steam wand (optional)*

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**).
- 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, see para. 7.3.



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

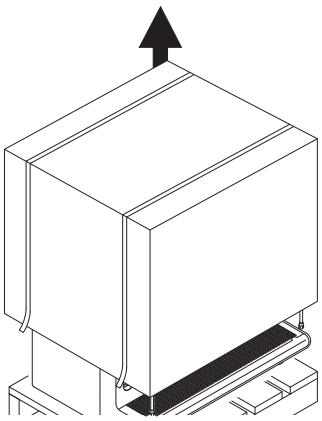
Upon arrival, the machine must be unloaded and handled with care, carefully following the instructions on the packaging, or those contained in this Manual.

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.

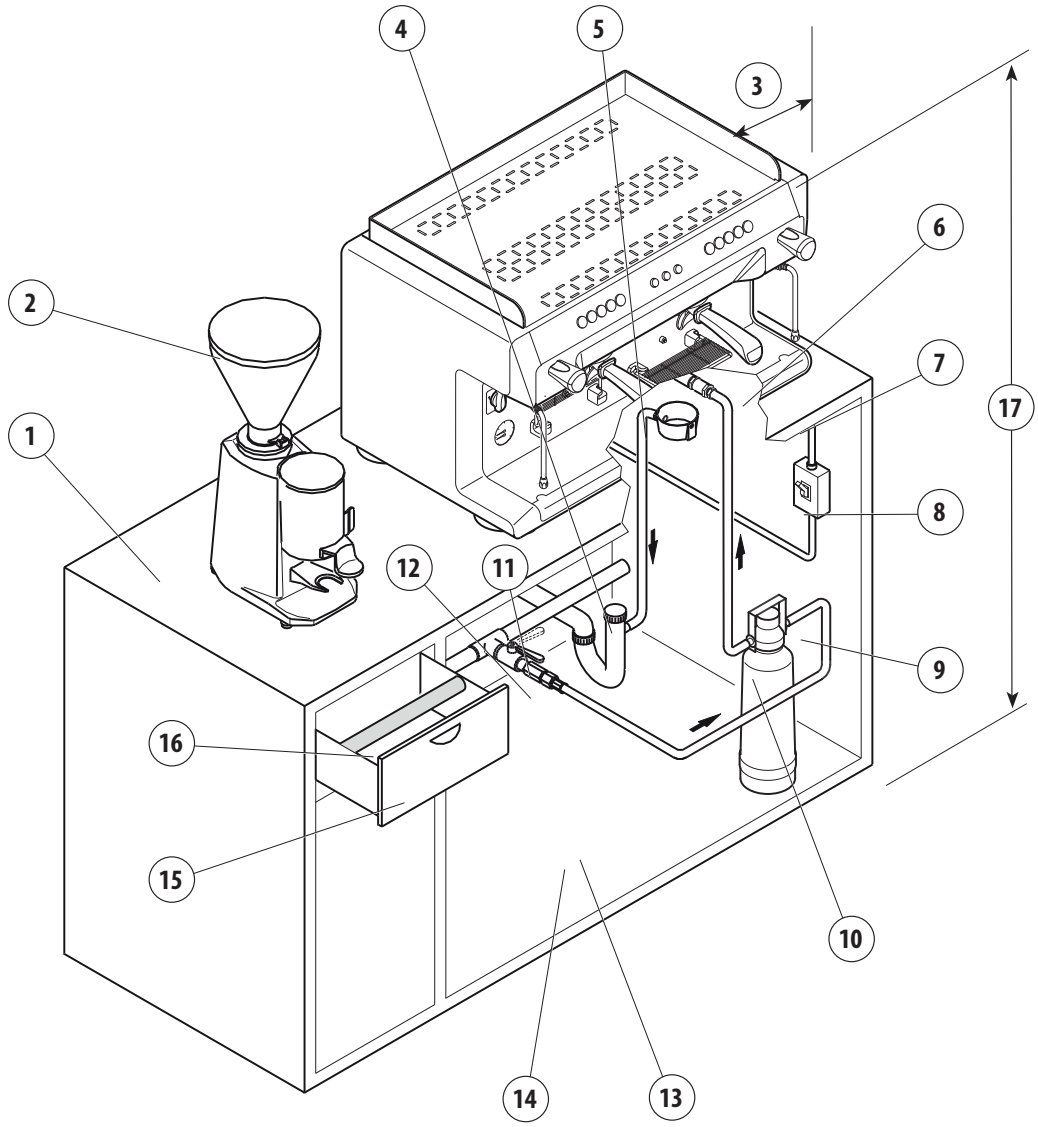
5.5 Support base

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 (**17**) 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 (**11**) and electrical mains (**8**) 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 (**15**) which will be used to deposit used coffee grounds and if possible, fit a rubber support as well (**16**) to knock the filter holder against.

FOR THE USA: Replace the machine's feet (7) 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 done by adjusting the feet (7).

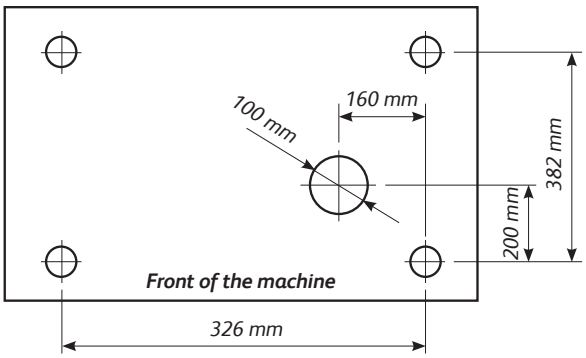


1. Support base
2. Grinder-dispenser
3. 50 cm minimum distance between the machine and the wall
4. Sewer drain
5. Drain tray
6. Water mains inlet
7. Adjustable feet of the machine
8. Electrical mains switch
9. Water filter inlet
10. Water filter outlet
11. Water mains tap
12. Water mains check valve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

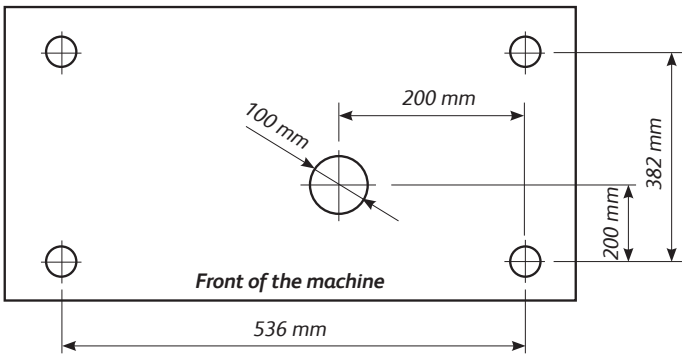
5.6 Drilling the support base

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.

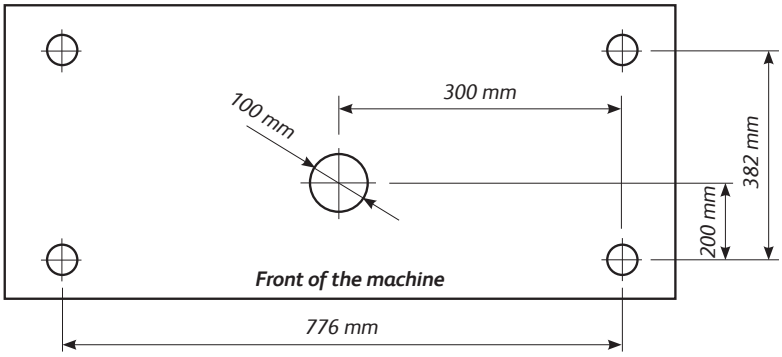
1 GROUP COMPACT



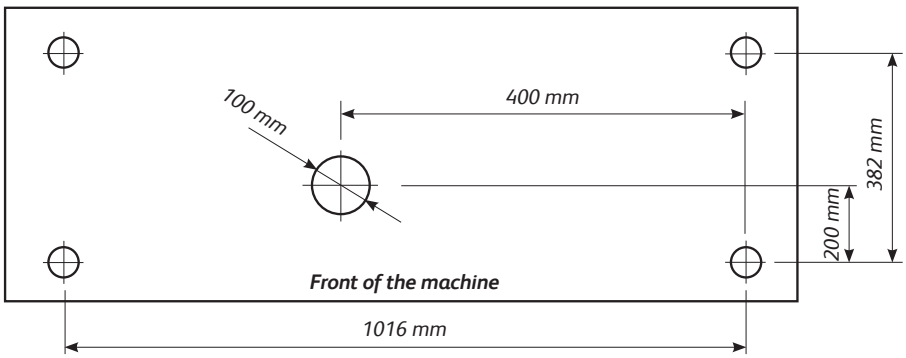
2 GROUPS



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:

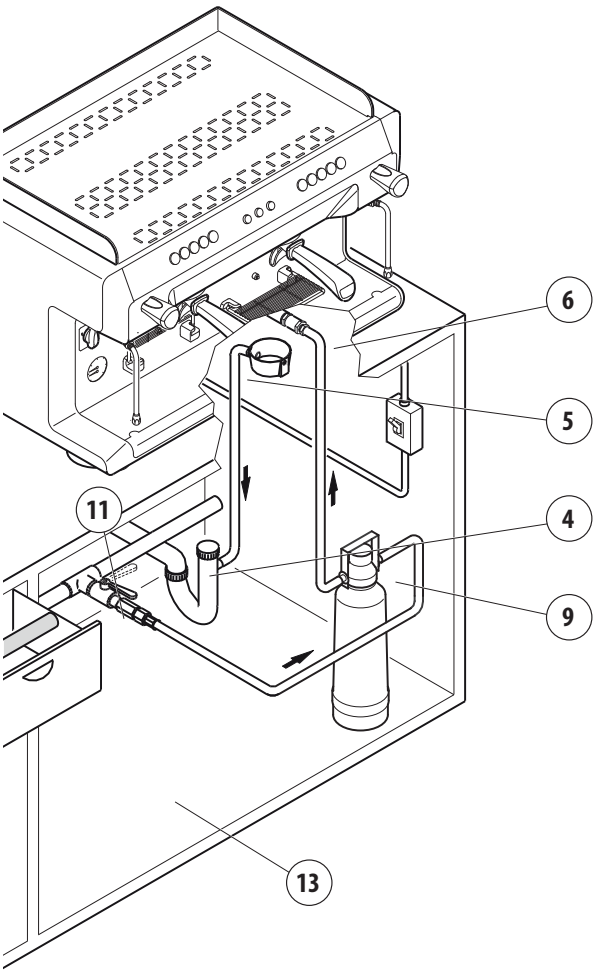
5.7.2 *Materials to be used*

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 (**9**) and/or motor pump (**13**), connect the water mains (**11**) directly to the machine's water inlet (**6**);
- When connecting the machine's tray (**5**) to the sewer drain (**4**), avoid overly tight curves or kinks, and make sure that there is sufficient inclination 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 oxidisation building up and damage to the machine over time, do not use iron connections for the hydraulic system, even if they are galvanised.



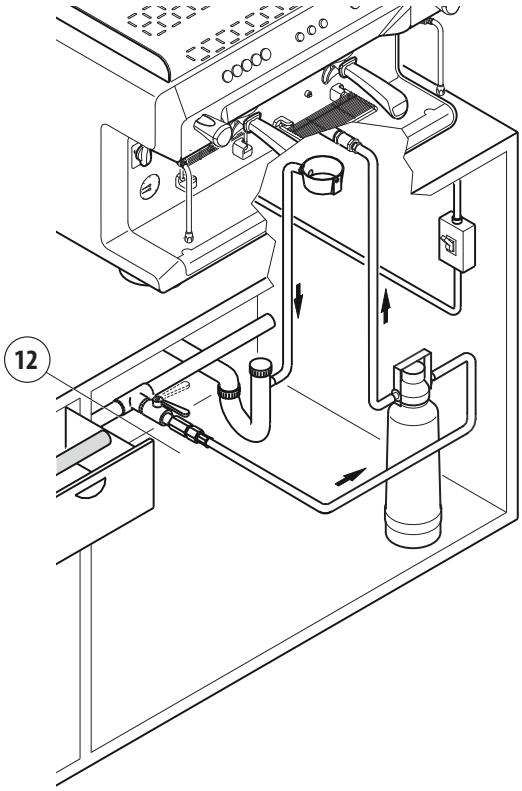
After installation and before using the machine, the water in the hydraulic circuits must be replaced, as indicated in para. "6.5 Water Renewal" on page 33.

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.

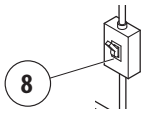
FOR THE EUROPEAN COMMUNITY: when connecting to a water mains or an external tank, a non-return valve (12) must be positioned upstream from the machine, as set forth by the EN 1717 standard.

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*

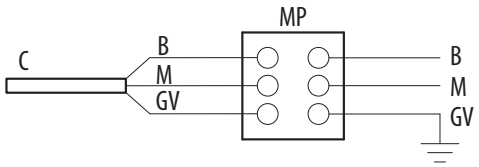
- The conformity of the electrical system, effectiveness of the earthing system and functionality of the differential circuit breaker - all of which are fundamental for guaranteeing the appliance's electrical safety - are the responsibility of the person in charge of the electrical system on which the 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. "14. WIRING DIAGRAMS" on page 77.
- 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. "14. WIRING DIAGRAMS" on page 77.



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 multimeter, 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.

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.

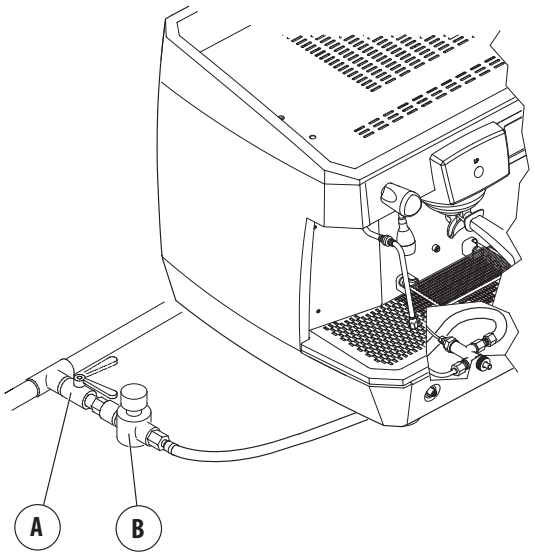
FOR GERMANY
The following requirements must be observed for installation:

- **The regulation regarding the local police and the fire department.**
- **The regulation regarding the workplace.**
- **The technical regulation on suction in terms of fireproofing.**
- **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.**

5.8.2 *Gas system connection*

To connect the gas system, proceed as follows:

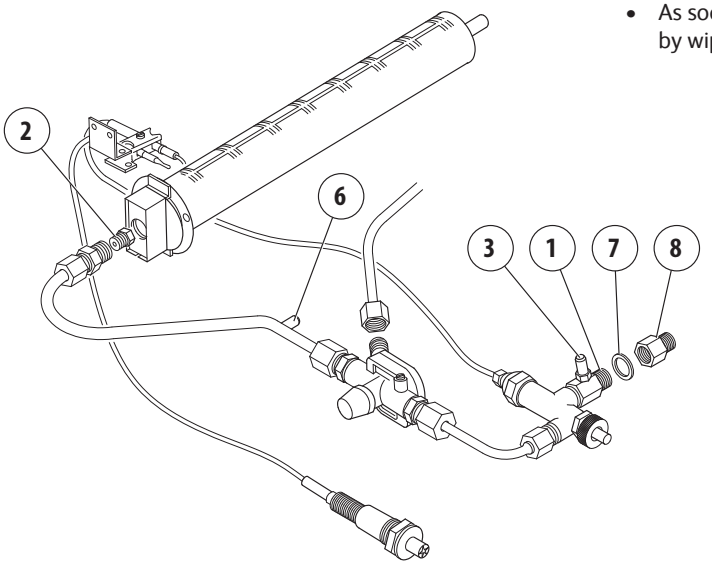
- Install a gas shut-off valve upstream of the machine (**A**).
- Install a gas pressure reducer upstream of the machine (**B**).
- The gas must be connected to the machine via a pipe in accordance with the current regulations of the country of installation using either a hose or rigid pipe.

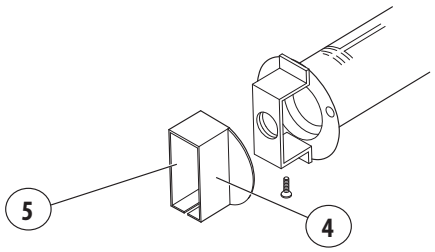


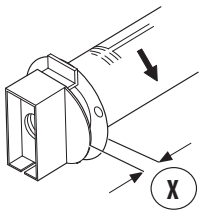
- If connecting with a hose, follow the instructions below:
  - Use a hose that complies with the current regulations (it is important to periodically replace it as indicated on the hose's stamp).
  - The hose must not be any longer than 1 metre.
  - Attach the hose to the connector (**1**) and if necessary, 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.

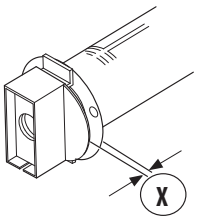
If the hose needs to be connected to the machine, we supply a conical fitting (8) with seal (7) to be installed on the cylindrical fitting (1).

- 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" a pagina 29 and replace the "Gas preparation" label on theating unitler cover with that 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" a pagina 29.
- 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	m3/h	kg/h
1 Group	G20	20	1.7	100	1	0.47	1.67	0.177	-
	G25	20	1.7	110	1	0.47	1.67	0.177	-
	G25.3	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 m3/h	=	2.78 x 10-4	m3/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

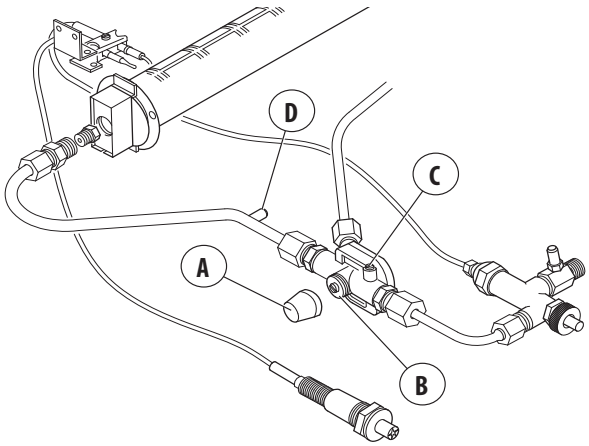
Set the minimum to 0.09 MPa (0.9 bar) and the maximum to 0.13 MPa (1.3 bar) and you will obtain a pressure in the heating unit of approx. 0.10-0.12 MPa (1.0-1.2 bar).

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**).

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.

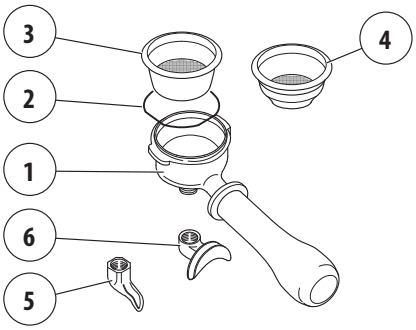
6.2 Preparing the filter holders

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**).

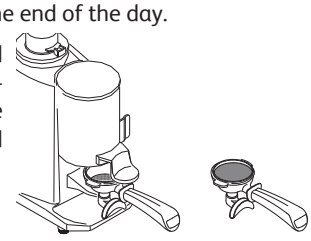


Properly connect the single filter with the single spout and the double filter with the double spout.

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:

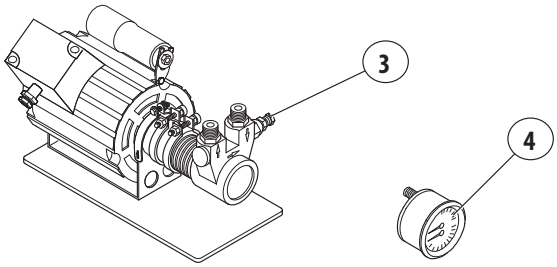
- To obtain a good espresso it is not recommended that you store large amounts of coffee beans. Comply with the expiry date indicated by the producer.
- Never grind large volumes of coffee, it is advisable to prepare the amount that can be held in the dosing device and if possible, use it by the end 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.

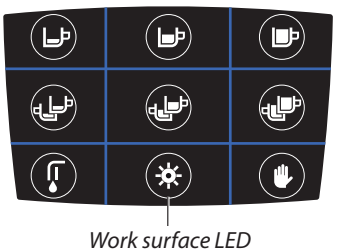


6.2.5 *Coffee grind*

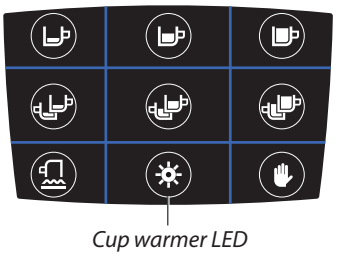
To adjust the coarseness of the ground coffee, use the appropriate regulator located on the grinder-dispenser hopper.

6.3 Lighting

To switch on or off the work surface lighting or cup warmer light, press the button on the corresponding pushbutton panel.



Work surface LED



Cup warmer LED

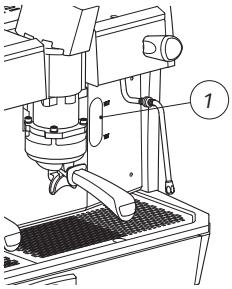
6.4 Turning the machine on and off

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.

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

6.4.1 *Electric heating for the AL version*

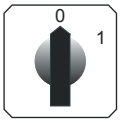
Before starting the machine, make sure that the level of water in the heating unit is higher than the minimum level indicated on the water level window (**1**).
If there is no water (first installation or after heating unit maintenance), the heating unit must be filled in advance in order to prevent the heating element from overheating.



Proceed as follows:

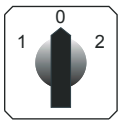
Switch

- Open the water mains valve.
- Using the manual fill function, 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.



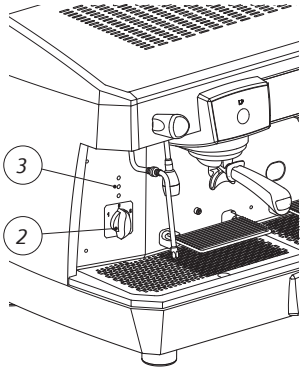
Power switch

- 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.



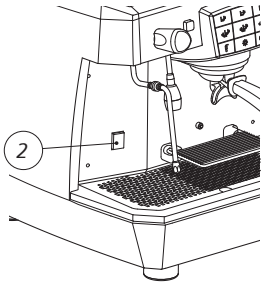
6.4.2 *Electric heating for the AEP and SAE versions*

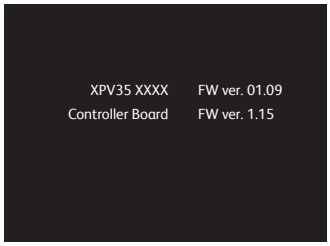
Press the machine's power switch (**2**).
The slow flashing warning light (**3**) indicates that the water is being filled up.
A steady warning light indicates that the standard water level has been reached in the heating unit.



6.4.3 *Electric heating for the DISPLAY version*

- Press the machine's main switch (**2**).
- Wait another second or so for the automatic test to be carried out.





- Wait for the water in the heating unit to be automatically refilled, if this is necessary. This will be shown on the display.

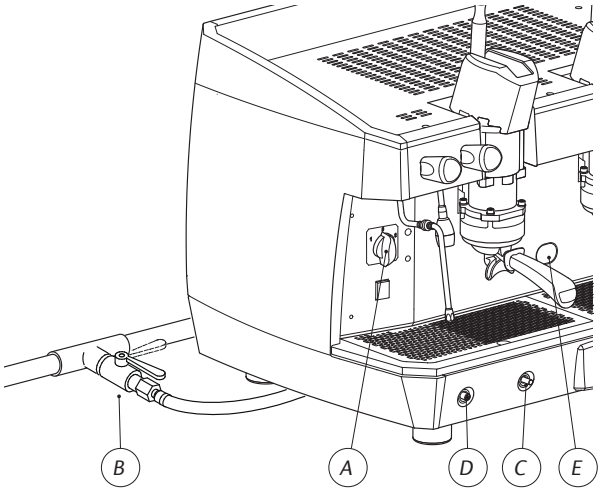
- Wait a few moments for the machine to fully heat up.

- If the timeout intervenes, a red flashing warning will appear on the display.

6.4.4 *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.
- Hold down the (**C**) button and, at the same time, press the ON button (**D**). Once the flame ignites, 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).



6.4.5 *Electric + gas heating*

(if a gas system has been installed)

- 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).

6.4.6 *Turning the machine off*

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

6.5 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 nozzle. 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.

6.6 Dispensing coffee

6.6.1 *Preparing the filter holder*

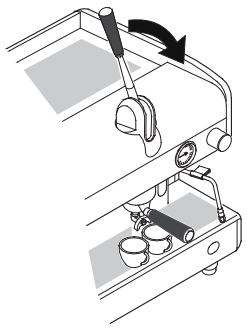
Before filling the filter holder, make sure it is empty and any previous coffee residue has been removed.

- Fill the filter with a dose of ground coffee (approx. 6-7 g); follow the procedures specified by the manufacturer of the grinder-dispenser.
- Compress the coffee with the special press.
- 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.

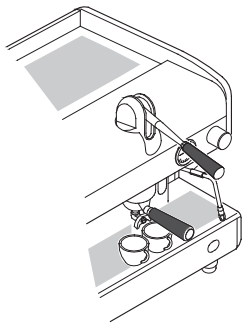
6.6.2 *AL version*

Never perform the 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.

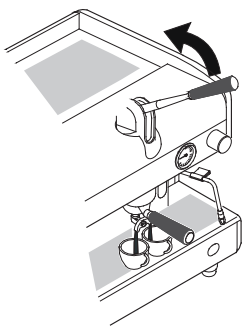
- Place the coffee cup under the dispensing spout.
- Pull the lever all the way down.



- Wait a short time for the coffee to be pre-infused (3-5 seconds).
- Lift the lever until a certain resistance is felt, then release it.

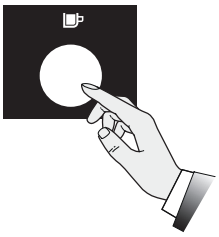


- Wait until the coffee has been dispensed.



6.6.3 *AEP version*

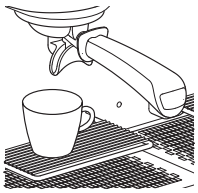
- Place the coffee cup under the dispensing spout.
- Press the desired dispensing switch; the coffee will begin being dispensed, and it can be stopped via the same switch once the desired amount of coffee has been dispensed into the cup.



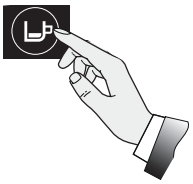
6.6.4 *SAE and DISPLAY versions*

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

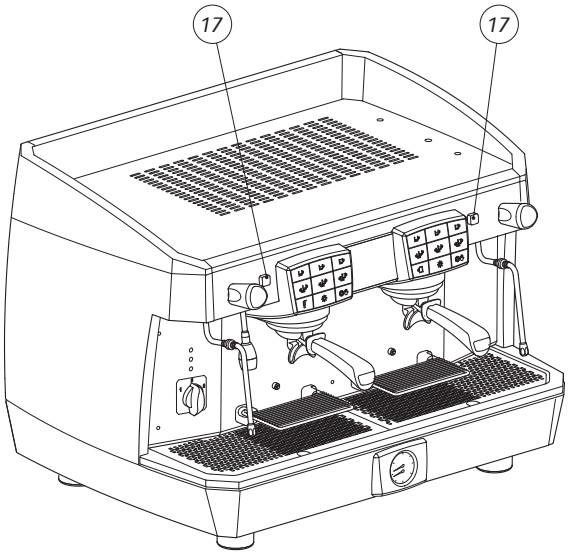
- Place the coffee cup under the dispensing spout.



- Press the desired dose button, e.g. and wait until the coffee is dispensed (LED will light up).
- To stop the coffee dispensing ahead of time, press the or button.



- When enabled, use the button to continuously dispense coffee.
- Should an anomaly occur or the pushbutton panel freeze, use the manual switch (**17**).

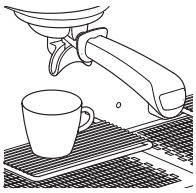


6.6.5 *Programming the coffee dispenses on the SAE and DISPLAY versions*

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

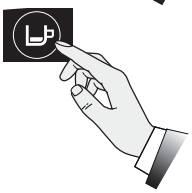
The machine is programmed by default. Should the coffee doses need to be modified, proceed as follows:

- Always programme the right pushbutton panel first. This way, all the pushbutton panels will be automatically programmed. If necessary, subsequently programme the others.

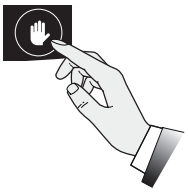


- Place the cup under the dispensing spout.
- Press the button for at least 5 seconds, until all the dose button LEDs are lit.

- Press the desired dose button, for example .
- To confirm the dose, press the button again or the button.



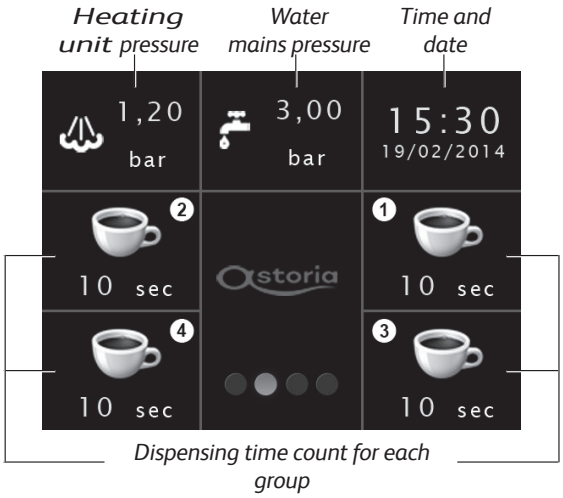
- Repeat this operation for the other dose buttons.
- When the programming is complete, press the button until all of the LEDs on the pushbutton panel go off.



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.

6.6.6 *Viewing information on the Display*

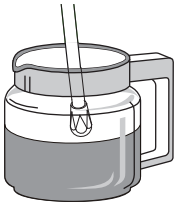
A series of information is shown on the display whilst the beverage is being dispensed.



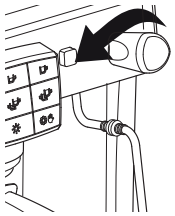
Dispensing time count for each group

6.7 Dispensing steam

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.

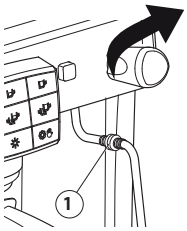


Before using the steam nozzle, the condensation draining operation must always be carried out for at least 2 seconds.



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

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



To optimally froth the milk, follow these simple rules:

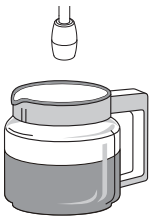
- Heat only the amount of milk you intend to use; once heated, it will have to be completely poured from the jug and not heated again.
- Froth the milk starting with a temperature of about 4°C.

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 nozzle 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.

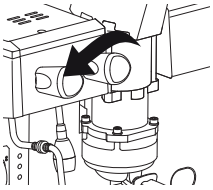
6.8 Dispensing hot water

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.

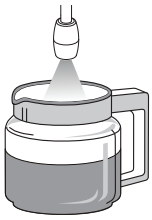


6.8.1 *AL and AEP versions*

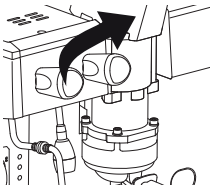
- Place the pot under the hot water nozzle.



- Rotate the valve knob anticlockwise.
- The hot water flow will be proportional to how open the valve is.

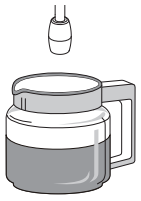


- To stop dispensing, turn the valve's knob clockwise.



6.8.2 *SAE and DISPLAY versions*

- Place the pot under the hot water nozzle.



- Press the water button and wait for the hot water to be dispensed.

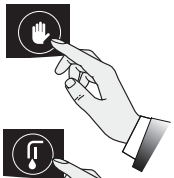
- To stop the dispensing ahead of time, press the hot water dispensing button again or press the button.

6.8.3 *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 nozzle.

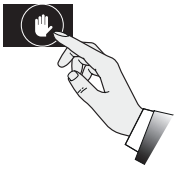
- Press the button for at least 5 seconds, until all the dose button LEDs are lit.



- Press the hot water dispensing button .

- To confirm the dose, press the button again.

- When the programming is complete, press the button until all of the LEDs on the pushbutton panel go off.



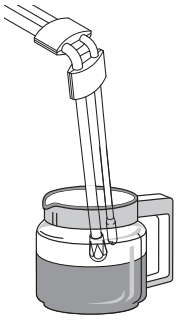
6.9 Automatic steam wand (optional)

6.9.1 *Tips regarding its use*

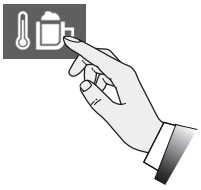
- Only froth the amount of milk that you intend to use; once heated, the milk will have to be completely poured out of the jug and cannot be reheated.
- The automatic steam wand only guarantees an accuracy of ± 3°C between the set temperature and the actual milk temperature, if the starting milk temperature 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).

6.9.2 *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 into the milk.
- Select the button.
- Wait until the dispensing process is complete. As an indication that the set temperature has been reached, the button will also change status.



- To stop dispensing ahead of time, press the button again.

The temperature of the beverage will always be shown on the display.

Automatic steam wand temperature

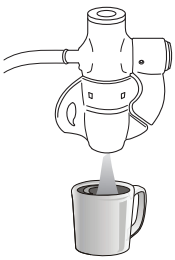
Select the button after the set temperature has been reached to dispense steam for an additional 10 seconds (function available up to a maximum temperature of 80°C) or disable it by pressing and holding down the first button for 10 seconds.

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. To keep the automatic steam wand nozzle tips in perfect working order, perform a brief dry dispensing run after each use.
When programmed, 5 minutes after the automatic steam wand was last used 2 sound alerts will go off and a few seconds later, the machine will automatically clean the steam wand using 5 short spurts of steam.
To change the temperature of the automatic steam wand, see para. 7.3.

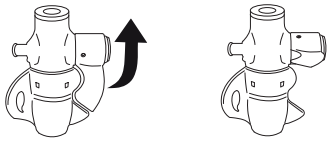
6.10 Dispensing cappuccinos (optional)

- 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 first, 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 8.9.2.

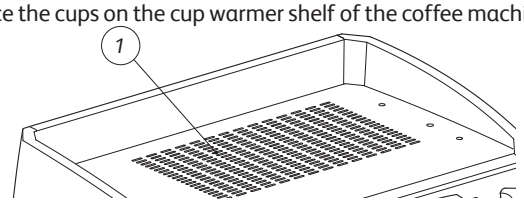


6.11 Cup warmer

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.

Place the cups on the cup warmer shelf of the coffee machine.



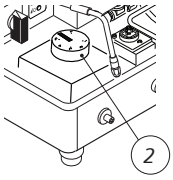
The cup warmer temperature can be set according to personal requirements. The procedure for activating and adjusting the cup warmer according to the model in your possession, is described below.

6.11.1 *AL and AEP versions*

To use the cup warmer, proceed as follows:

- Place the cups on the cup warmer shelf of the coffee machine.
- Turn the cup warmer switch to ON.

To adjust the cup warmer temperature, proceed as follows:



- Remove the cup holder grille and drip tray.
- Turn the thermostat (**2**); the temperature will be proportional to the value indicated on the thermostat.

0	Cup warmer off
30	Minimum temperature
60	Average temperature
90	Maximum temperature

6.11.2 *SAE and DISPLAY versions*

To use the cup warmer, proceed as follows:

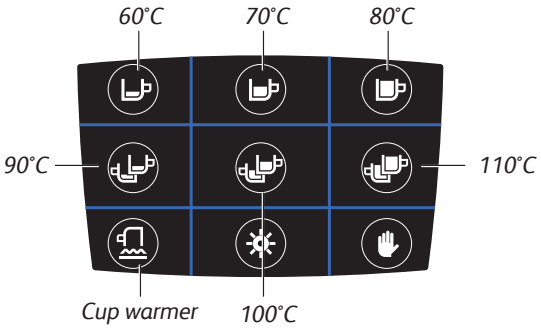
- Place the cups on the cup warmer (**1**) shelf of the coffee machine.
- Select the cup warmer button on the pushbutton panel .

The red colour on the display indicates that the cup warmer is heating up.

6.11.3 *Programming the cup warmer on the SAE version*

To adjust the cup warmer temperature, proceed as follows using the right pushbutton panel:

- When the machine is switched on, wait for all of the button LEDs to light up and then immediately press the button: the flashing LED will indicate the current configuration of the cup warmer, as shown in the diagrams below.
- Hold down the button until the LED on the panel goes from a flashing to a steady light.
- Press the key that corresponds to the desired configuration.
- Confirm the operation by switching the machine off and back on.



6.11.4 *Programming the cup warmer on the DISPLAY version*

To adjust the temperature of the cup warmer on the Display model, see chapter 6.13.4.

6.12 Programming the standby mode (SAE version)

To put the machine in standby mode, i.e. switch it off whilst keeping the pushbutton panel active, proceed as follows:

- Press the button on the right pushbutton panel and the button immediately afterwards.
- The machine is in standby mode when the button's LED flashes.
- To exit the standby mode, press the button.

7. Programming the "DISPLAY" version machine parameters

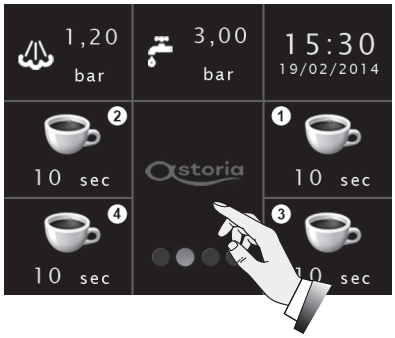
7.1 Accessing the menu

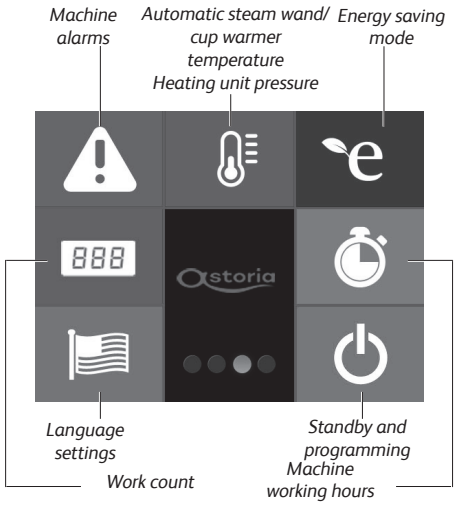
To access the machine's programming modes and where the data can be viewed, touch the display twice.
Select the various buttons to access the sections indicated in the following paragraphs.

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.

To update the machine's software, see para. 8.7.





ALARMS (para. 7.2)

AUTOMATIC STEAM WAND TEMPERATURE (para. 7.3)
CUP WARMER TEMPERATURE (para. 7.4)
HEATING UNIT PRESSURE (para. 7.5)

ENERGY SAVING MODE (para. 7.6)

WORK COUNT (par. 7.7)

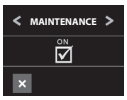
WORK SCHEDULE (para. 7.8)

LANGUAGE (para. 7.9)

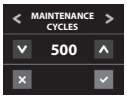
STANDBY (para. 7.10)
PROGRAMMING (para. 7.14)

SOFTWARE INFORMATION (para. 7.12)

Enabling PRE-INFUSION (para. 7.14.1)



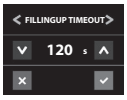
Enabling MAINTENANCE (para. 7.14.2)



MAINTENANCE CYCLE programming enabling the display warning (para. 7.14.3)

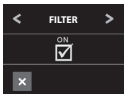
Programming the AUTOMATIC STEAM WAND OFFSET (para. 7.14.4)

Programming the STEAM NOZZLE AUTOMATIC WASH (para. 7.14.5)



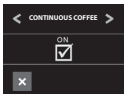
Programming the FILLING-UP TIMEOUT of the heating unit (para. 7.14.6)

Programming the LEVEL RESTORATION TIMEOUT of the heating unit (para. 7.14.7)

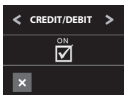


Enabling the WATER FILTER (para. 7.14.8)

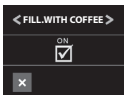
Programming the WATER FILTER WARNING (para. 7.14.9)



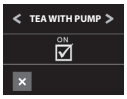
Enabling the CONTINUOUS COFFEE BUTTON (para. 7.14.10)



Enabling the CREDIT/DEBIT function (para. 7.14.11)

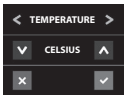


Enabling the HEATING UNIT FILLING PHASE whilst coffee is dispensing (para. 7.14.12)



Enabling the TEA WITH PUMP (para. 7.14.13)

Enabling the pump's PRESSURE SENSOR (para. 7.14.14)



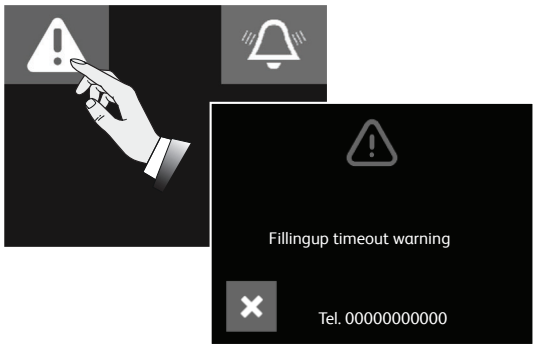
Programming the TEMPERATURE unit of measurement (para. 7.14.15)

Setting up the ASSISTANCE PHONE NR. (para. 7.14.16)

Setting the PASSWORD (para. 7.14.17)

7.2 Machine warnings

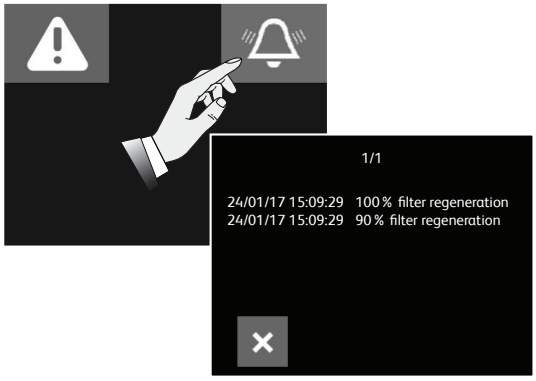
To view the machine alarms, press the ⚠ button.



Select the ⚠ button to view the machine's current warnings (see the list below).
Should any of these occur, call out the Technician by calling the number shown on the display.
To exit, press the ✕ button.

Warnings	Alarm
Steam heating unit temperature probe has overheated or short-circuited	Warning data is corrupted
Steam heating unit temperature probe is disconnected or cut off	Change filter warning (90 % worn)
Cup warmer temperature probe has overheated or short-circuited	Filter completely worn warning
Cup warmer temperature probe is disconnected or cut off	Maintenance warning
Steam nozzle probe has short-circuited	Heating unit heating time-out warning
Steam nozzle probe is disconnected or cut off	Volumetric counter warning for each group
Fillingup timeout warning	

Select the 🔔 button to view the machine's alarm history.
To exit, press the ✕ button.



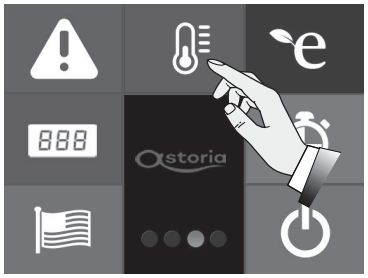
Should an alarm occur, call out the Technician by calling the number shown on the display and turn off the machine.

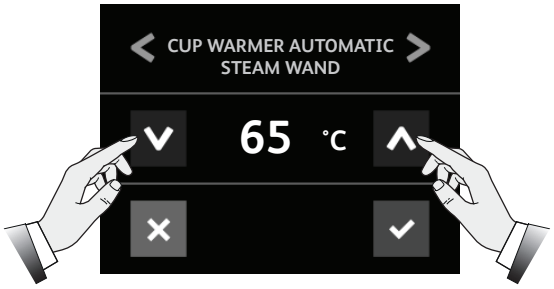
7.3 Automatic steam wand temperature

Select the button to programme the temperature of the automatic steam wand:

- Use the ∧ and ∨ arrows to set the desired temperature.
- To confirm, press the ✓ button.
- To exit, press the ✕ button.

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





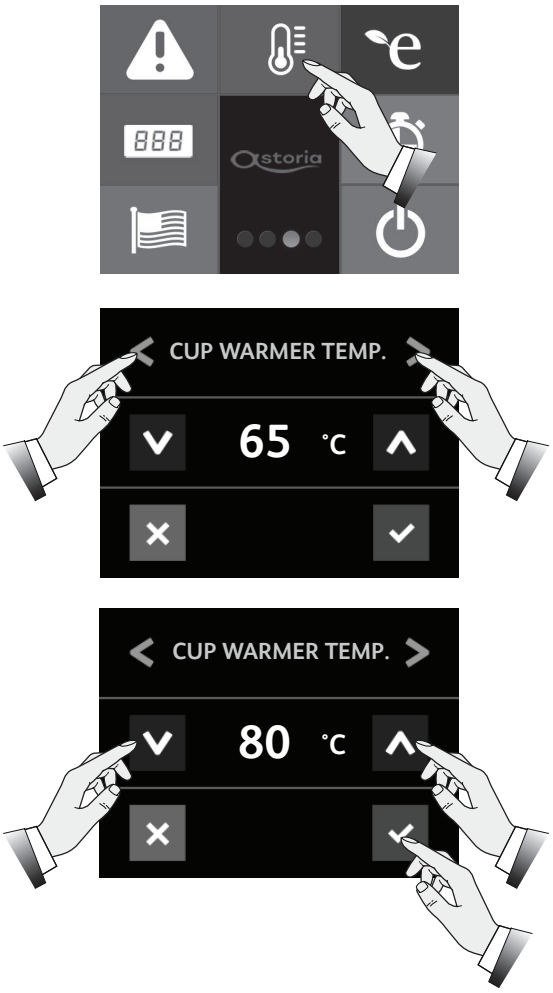
7.4 Cup warmer temperature

Select the button to programme the temperature of the cup warmer:

- Use the and arrows to set the "CUP WARMER TEMPERATURE";
- Use the and arrows to set the desired temperature.
- To confirm, press the button.
- To exit, press the button.

Whenever the cup warmer is on, an indicator will appear on the display.

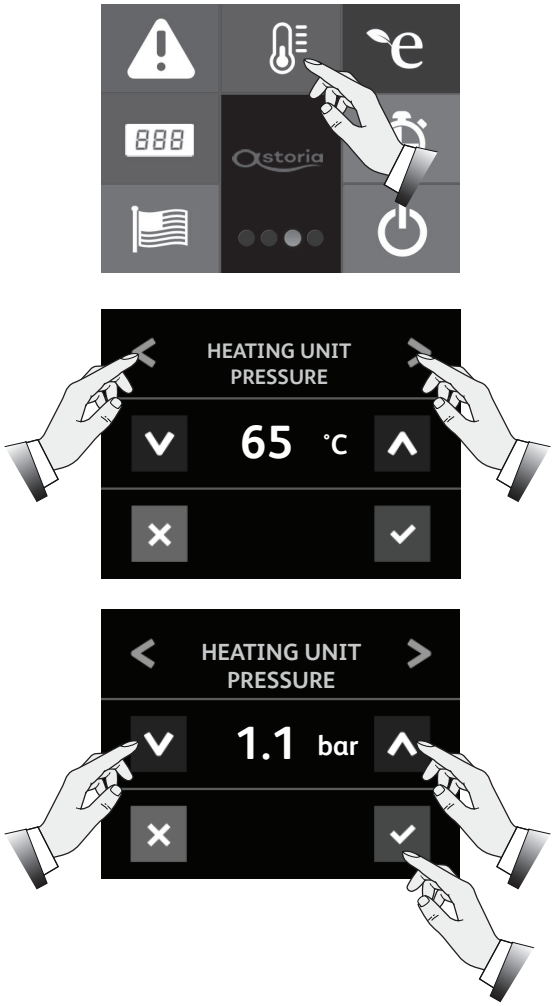
HIGH TEMPERATURE HAZARD: Please remember that a very high temperature can cause very serious burns.



7.5 Heating unit pressure

Select the button to programme the heating unit pressure:

- Use the and arrows to set the "HEATING UNIT PRESSURE".
- Use the and arrows to set the desired pressure.
- To confirm, press the button.
- To exit, press the button.



7.6 Energy saving mode

Select the e button to programme the machine's energy saving mode:

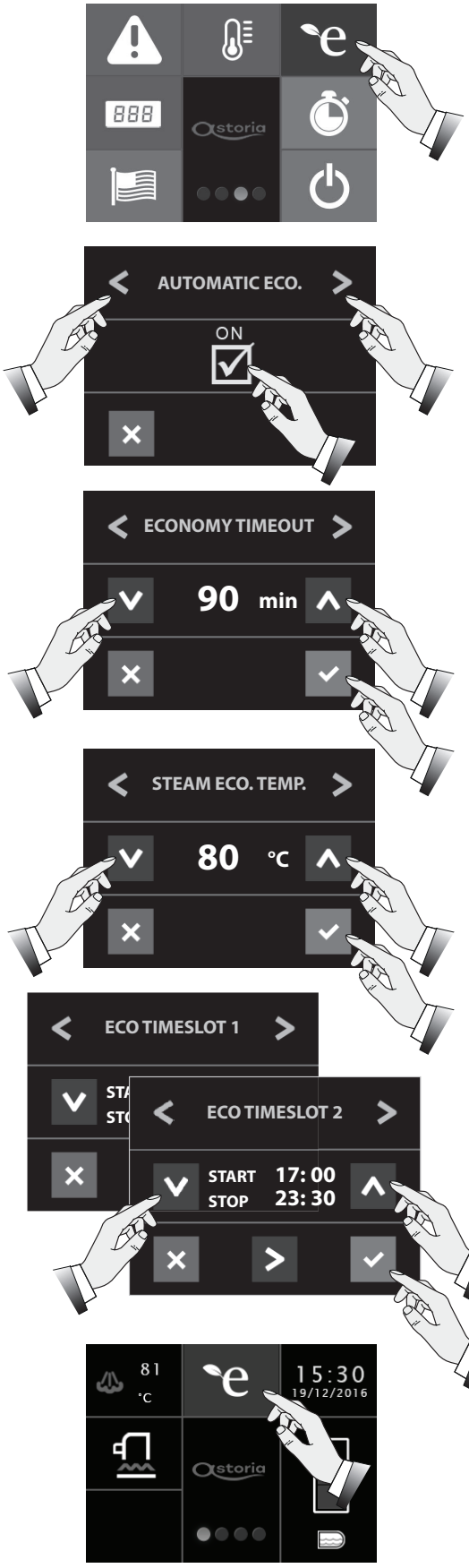
- Use the > and < arrows to set the AUTOMATIC ECO." mode;
- Select the ON programming button;
- Use the > and < arrows to set the "ECONOMY TIMEOUT" mode;
- Use the ∧ and ∨ arrows to set the desired timeout time;
- To confirm, press the ✓ button.
- Use the > and < arrows to set the "STEAM ECO. TEMP";
- Use the ∧ and ∨ arrows to set the heating unit temperature;
- To confirm, press the ✓ button.
- Use the > and < arrows to set the "ECO TIMESLOT 1" or "ECO TIMESLOT 2". This way it will be possible to programme two automatic machine ON and OFF times during the day;
- Use the > ∧ ∨ arrows to set the machine switch-on and switch-off times.
- To confirm, press the ✓ button;
- To exit, press the ✕ button.
- When the energy saving mode is enabled, the e icon will appear on the display.
- If the "MANUAL ECO." mode is set via the > and < arrows, the system will immediately enter the energy saving mode;

To exit the energy saving mode, select the e button again or any other selection button.

Two fixed logos (those below) are available in the Screen Saver, and it is possible to upload a customised image via USB stick to the boot loader.
This image must and have the following characteristics:

- File name: logo.bmp
- image type: bitmap
- resolution: 320x240 pixels.

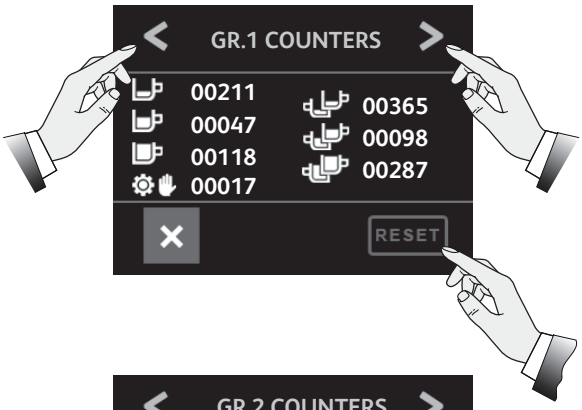
To delete the previously loaded image, reprogram the display software by omitting the image file on the USB stick.

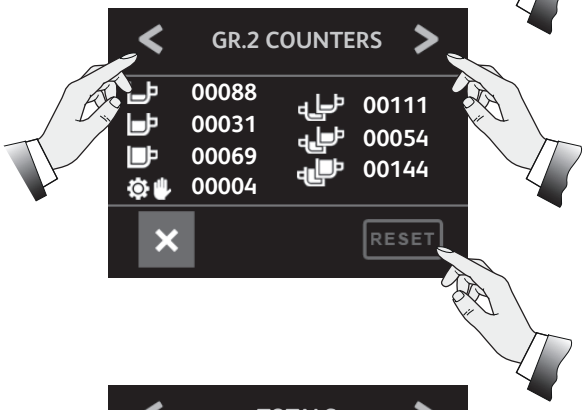


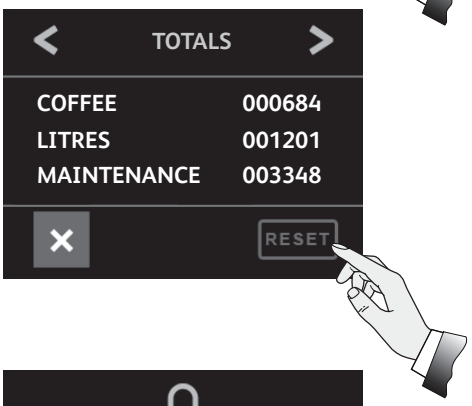
7.7 Work count

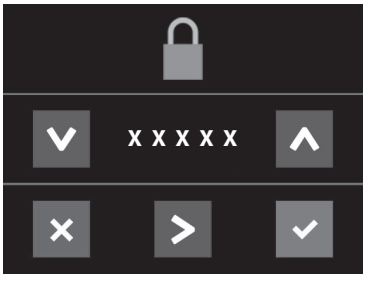
Select the 888 button to view the work that has been performed by the machine:

- Use the > and < arrows to select the desired group.
- To reset the counts to zero, press the RESET button;
- The counts for the total coffee dispenses, the litres of water consumed and the maintenance cycle are displayed on the last page. Only a Qualified Technician can reset all of the data (the life of the machine) by entering the specific password;
- To exit, press the ✕ button.





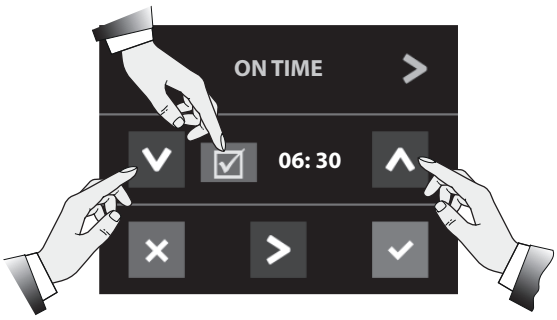


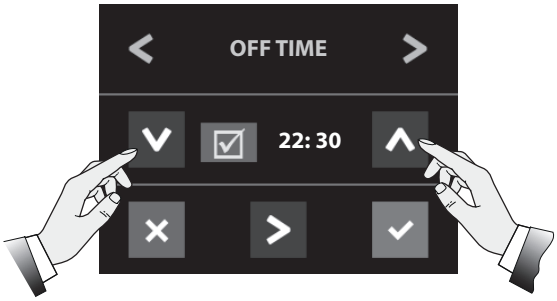


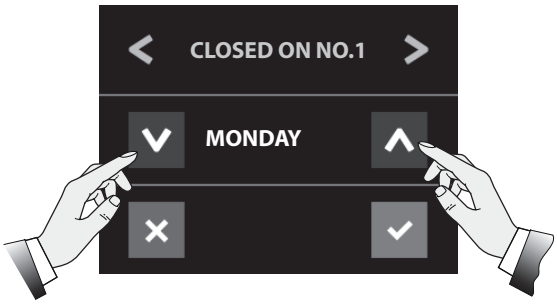
7.8 Work schedule

Select the button in order to programme the ON and OFF times of the machine, and its non-operating days:

- Use the and arrows to set the “ON” time;
- To enable the machine's ON function, press the button.
- Use the and arrows to set the time when the machine switches on;
- Use the arrow to move the cursor to the value.
- To confirm, press the button.
- Use the and arrows to set the “OFF” time;
- To enable the machine's OFF function, press the button.
- Use the and arrows to set the time when the machine switches off;
- Use the arrow to move the cursor to the value.
- To confirm, press the button.
- Use the and arrows to set the “CLOSED ON 1”;
- Use the and arrows to set the machine's first non-operating day;
- Follow the same procedure for the second non-operating day;
- To confirm, press the button.
- To exit, press the button.



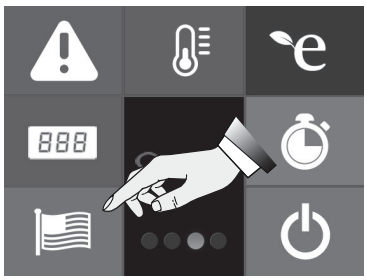


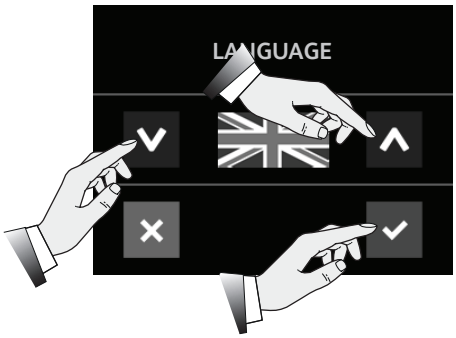


7.9 Language

Select the button to programme the language of the display:

- Use the and arrows to set the desired display language.
- To confirm, press the button;
- To exit, press the button.

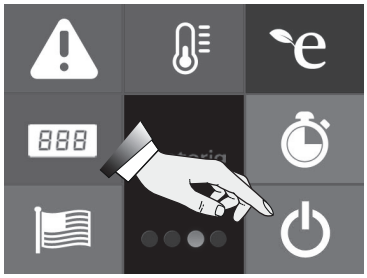




7.10 Machine standby and programming

Select the button to enter the machine's programming mode.

Only the Technician is authorised to perform this operation via the specific password.

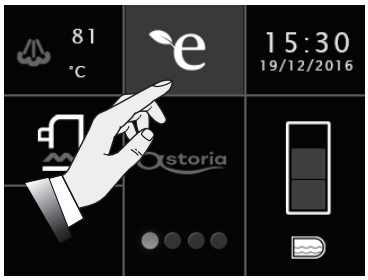


7.11 Energy saving mode

When the energy saving mode is active, the icon will appear on the display.

To stop the energy saving mode, press the button or any dispensing button.

For information on programming the energy saving mode, see para. 7.6.

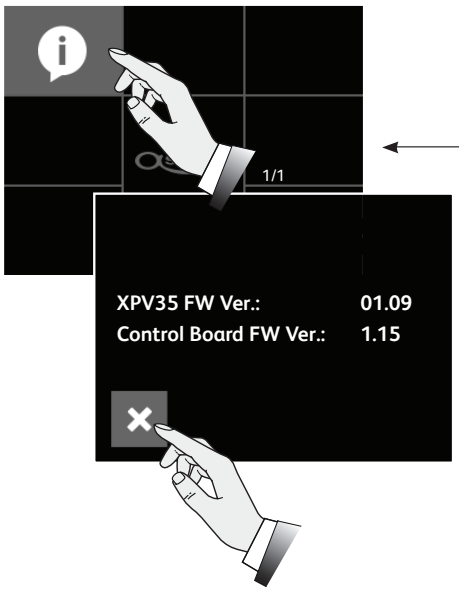


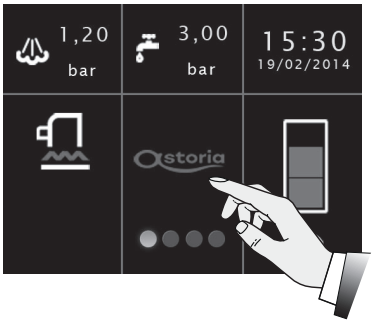
7.12 Software information

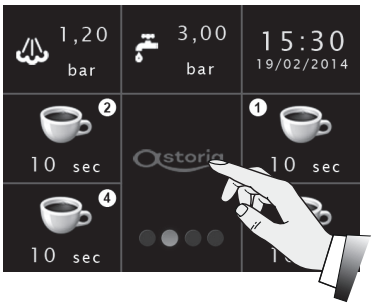
To view the data regarding the installed software, tap the display several times.

Select the button and the information regarding the software will be made available.

To exit, press the button.





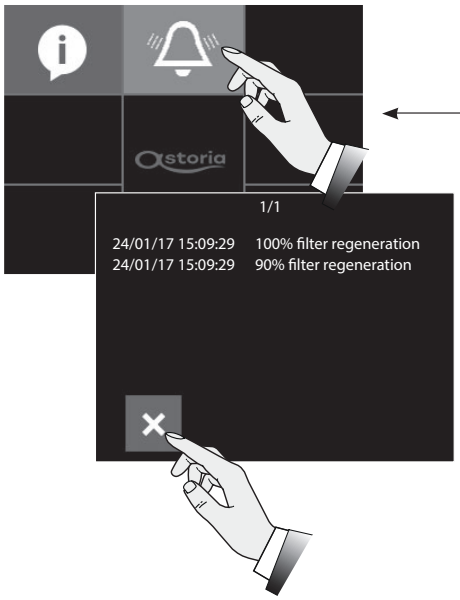


7.13 Alarm history

Select the button to view the machine's alarm history.

Only a Maintenance Technician can reset the data RESET by entering the specific password.

To exit, press the button.

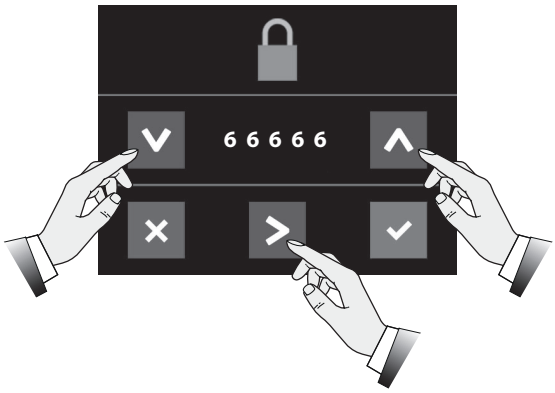


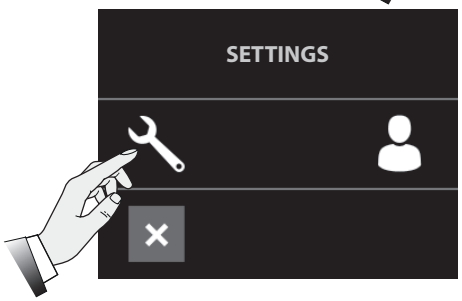
7.14 Parameter programming

Select the button in order to programme the ON and OFF times of the machine, and its non-operating days:

- Select the button.
- Use the and arrows to enter the access password:
  6 6 6 6 6

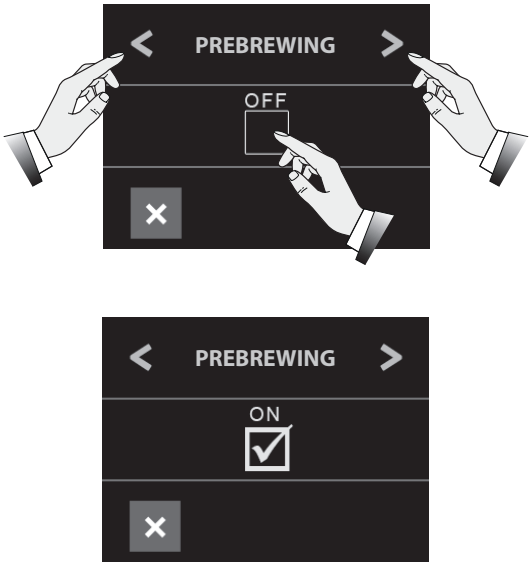
- Use the arrow to move the cursor to the value;
- Press the button;
- Programme the machine parameters as indicated in the following paragraphs;
- To exit, press the button.





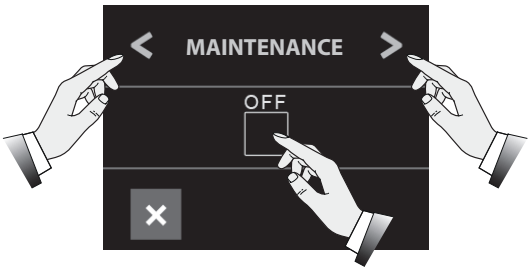
7.14.1 *Prebrewing*

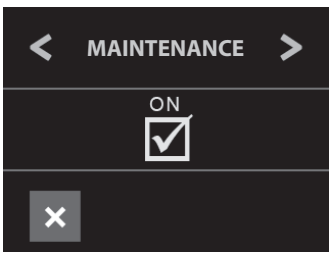
- Select the > and < arrows until the word "PREBREWING" appears on the display;
- Tick the checkbox to enable or disable the prebrewing function;
- To exit, press the ✕ button.



7.14.2 *Maintenance*

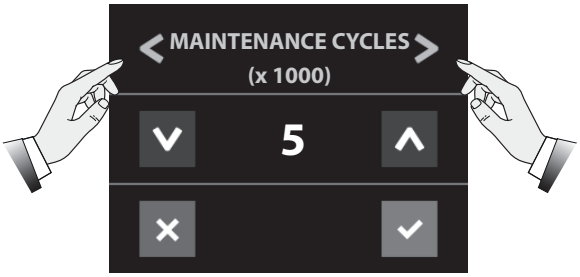
- Select the > and < arrows until the word "MAINTENANCE" appears on the display;
- Tick the checkbox to enable or disable the service function;
- To exit, press the ✕ button.



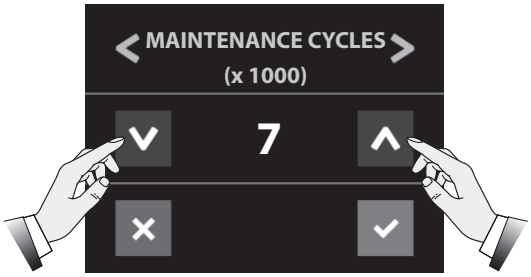


7.14.3 *Maintenance cycles*

- Select the > and < arrows until the words "MAINTENANCE CYCLES" appear on the display;

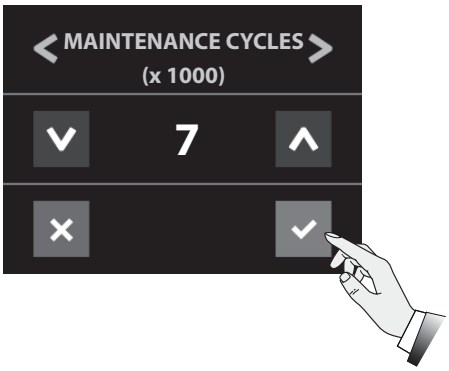


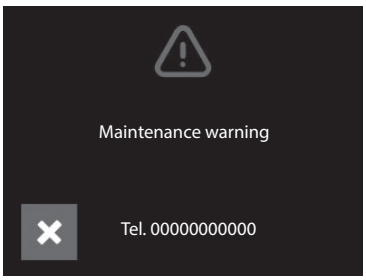
- Use the ∧ and ∨ arrows to set the number of cycles (x 1000) after which the display will prompt for maintenance to be carried out;



- To confirm, press the ✓ button;
- To exit, press the ✕ button.

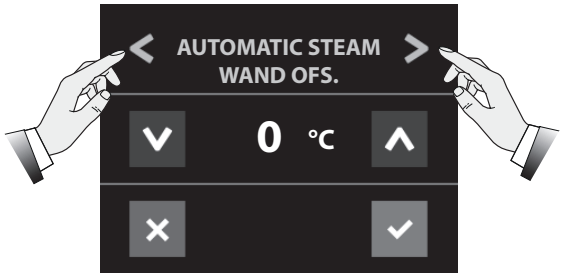
To reset the “Maintenance warning" on the display, follow the instructions in para. “8.1 MACHINE ALARMS” on page 48.

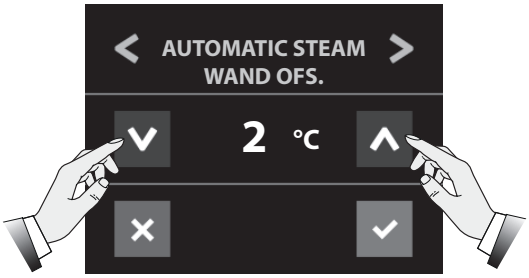


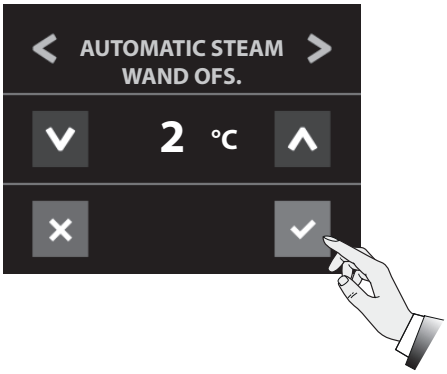


7.14.4 *Automatic steam wand offset*

- Select the > and < arrows until the words "STEAM WAND OFS." appear on the display;
- Use the ∧ and ∨ arrows to set the automatic steam wand offset temperature;
- To confirm, press the ✓ button;
- To exit, press the ✕ button.



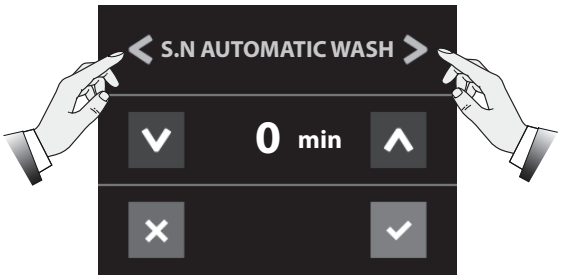


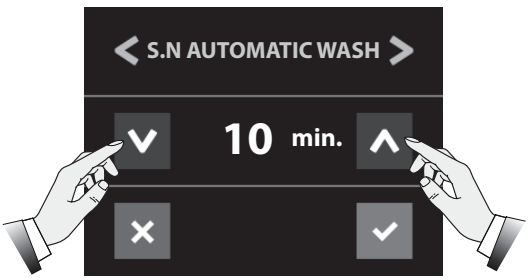


7.14.5 *Steam nozzle automatic wash*

- Select the > and < arrows until the word "S.N AUTO. WASH" appears on the display;
- Use the ∧ and ∨ arrows to set the automatic activation time (in minutes) of the steam nozzle wash, after its last use. If a "0" is entered, this function will be disabled;
- To confirm, press the ✓ button;
- To exit, press the ✕ button.

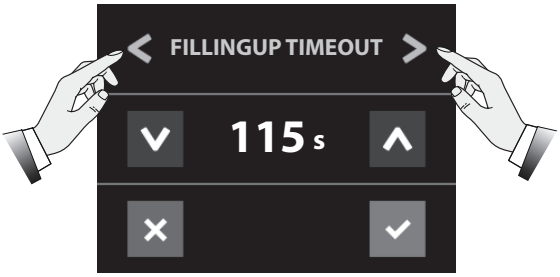
A few seconds before the automatic steam nozzle wash starts, 2 sound alerts will go off and then 5 short spurts of steam will be dispensed.

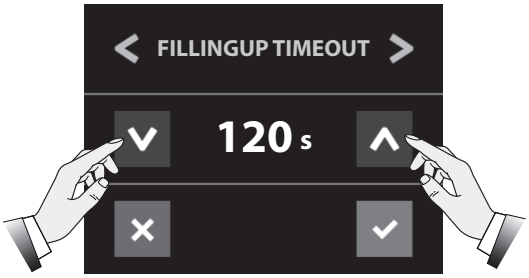


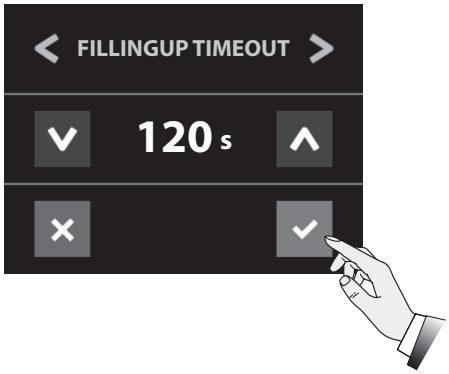


7.14.6 *Filling-up timeout*

- Select the > and < arrows until the words "FILLINGUP TIMEOUT" appear on the display;
- Use the ∧ and ∨ arrows to set the maximum heating unit filling time (in seconds);
- To confirm, press the ✓ button;
- To exit, press the ✕ button.

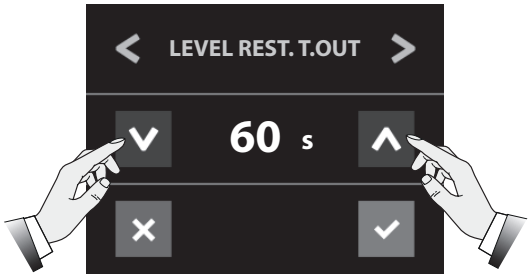


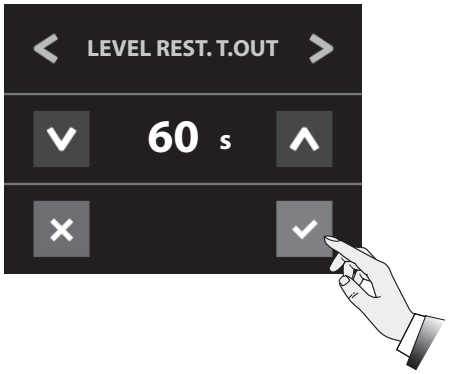




7.14.7 *Level restoration timeout*

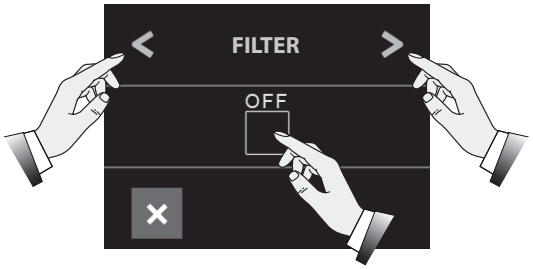
- Select the > and < arrows until the words "LEVEL REST. T.OUT" appear on the display;
- Use the ∧ and ∨ arrows to set the maximum heating unit level restoration time (in seconds);
- To confirm, press the ✓ button;
- To exit, press the ✕ button.

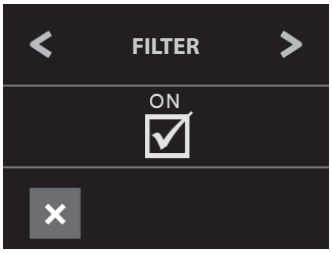




7.14.8 *Water filter*

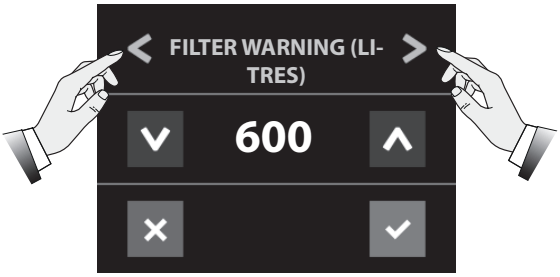
- Select the > and < arrows until the word "FILTER" appears on the display;
- Tick the checkbox to enable or disable the water filter function;
- To exit, press the ✕ button.

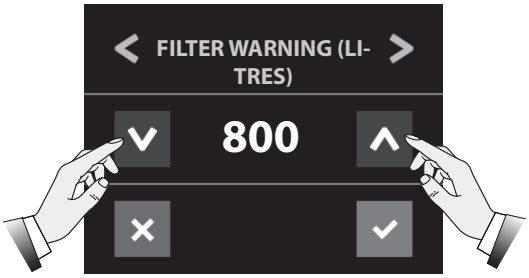


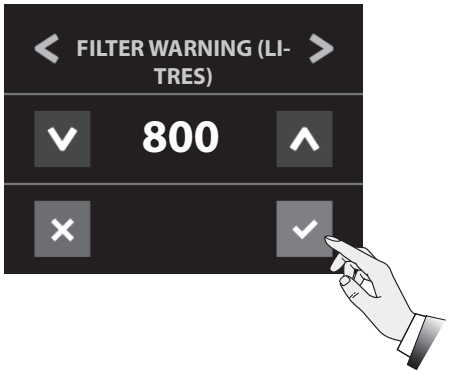


7.14.9 *Water filter warning*

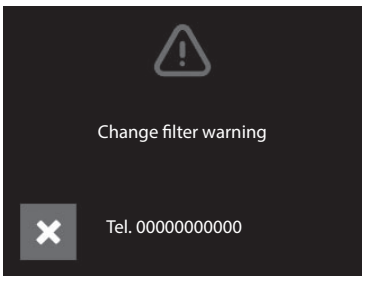
- Select the > and < arrows until the words "FILTER WARNING (LITRES)" appear on the display;
- Use the ∧ and ∨ arrows to set an amount of water used by the machine after which the display will prompt for filter to be replaced;
- To confirm, press the ✓ button;
- To exit, press the ✕ button.





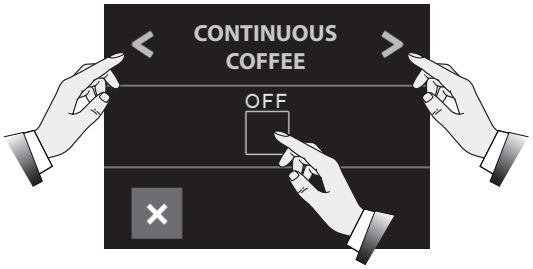


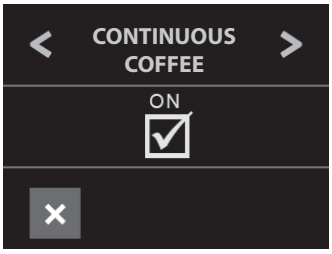
To reset the "Change filter warning" or the "Filter completely worn warning" on the display, follow the instructions in para. “8.1 MACHINE ALARMS” on page 52.



7.14.10 *Continuous coffee*

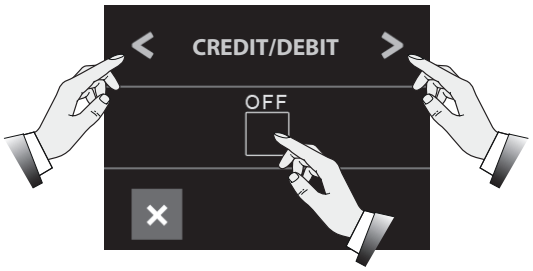
- Select the > and < arrows until the words "CONTINUOUS COFFEE" appear on the display;
- Tick the checkbox to enable or disable the continuous dispensing button ;
- To exit, press the ✕ button.

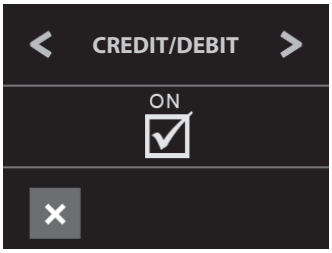




7.14.11 *Credit - Debit*

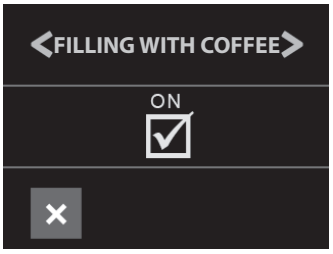
- Select the > and < arrows until the word "CREDIT/DEBIT" appears on the display;
- Tick the checkbox to enable or disable the Credit - Debit function;
- To exit, press the ✕ button.





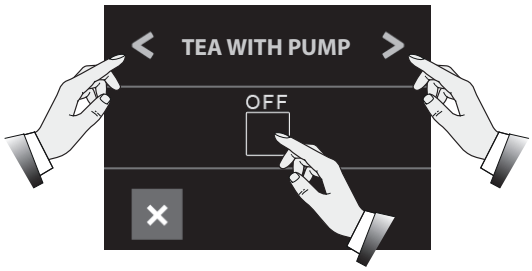
7.14.12 *Filling with coffee*

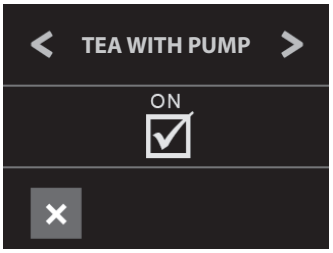
- Select the > and < arrows until the words "FILL. WITH COFFEE" appear on the display;
- Tick the checkbox to enable or disable the heating unit filling function while coffee is being dispensed;
- To exit, press the ✕ button.



7.14.13 *Tea with pump*

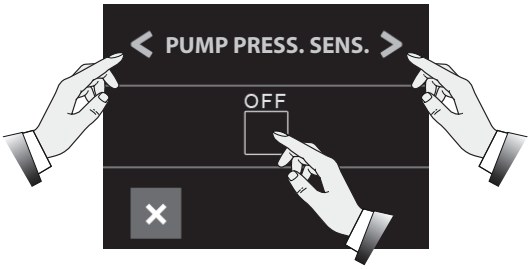
- Select the > and < arrows until the words "TEA WITH PUMP" appear on the display;
- Tick the checkbox to enable or disable the tea dispensing function with the pump;
- To exit, press the ✕ button.

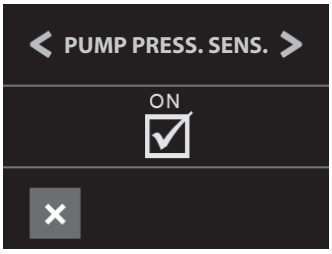




7.14.14 *Pump pressure sensor*

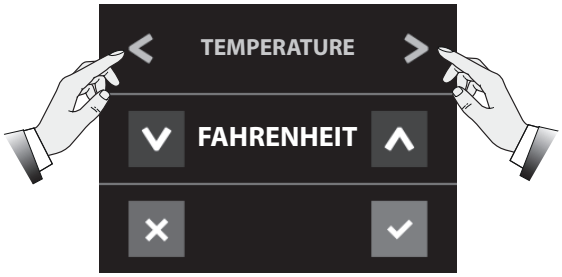
- Select the > and < arrows until the words "PUMP PRESS. SENS." appear on the display;
- Tick the checkbox to enable or disable the pump pressure sensor;
- To exit, press the ✕ button.

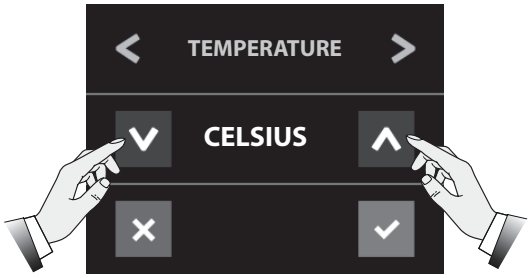


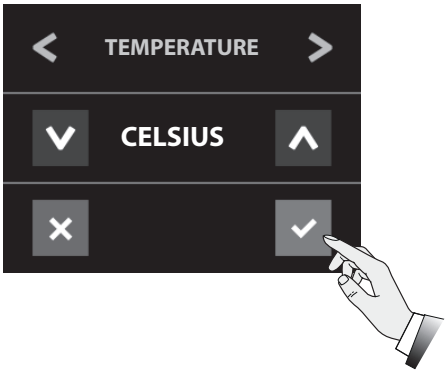


7.14.15 *Temperature*

- Select the > and < arrows until the word "TEMPERATURE" appears on the display;
- Use the ∧ and ∨ arrows to set the unit of measurement to use for the temperature (°C or °F);
- To confirm, press the ✓ button;
- To exit, press the ✕ button.

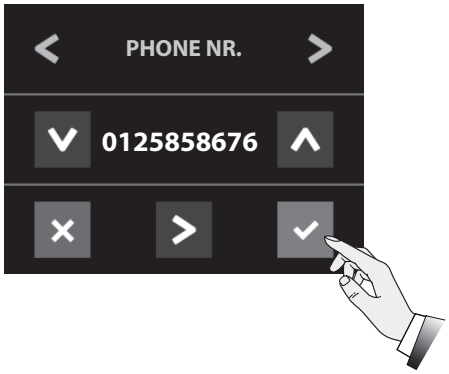






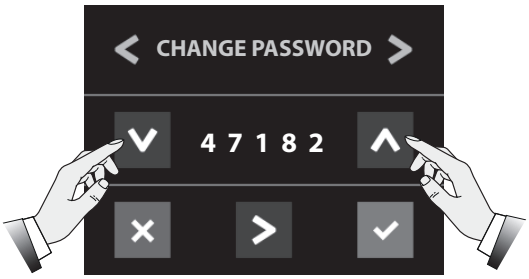
7.14.16 *Support phone number*

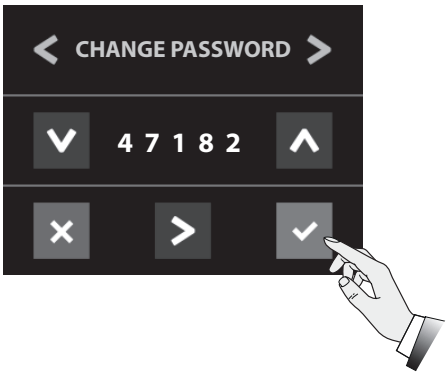
- Select the > and < arrows until the words "PHONE NR." appear on the display;
- Use the ∧ and ∨ arrows to set the phone number for the Technical Assistance which will be shown if the user requires it. Use the > arrow to move the cursor to the value;
- To confirm, press the ✓ button;
- To exit, press the ✕ button.



7.14.17 *Technician Password*

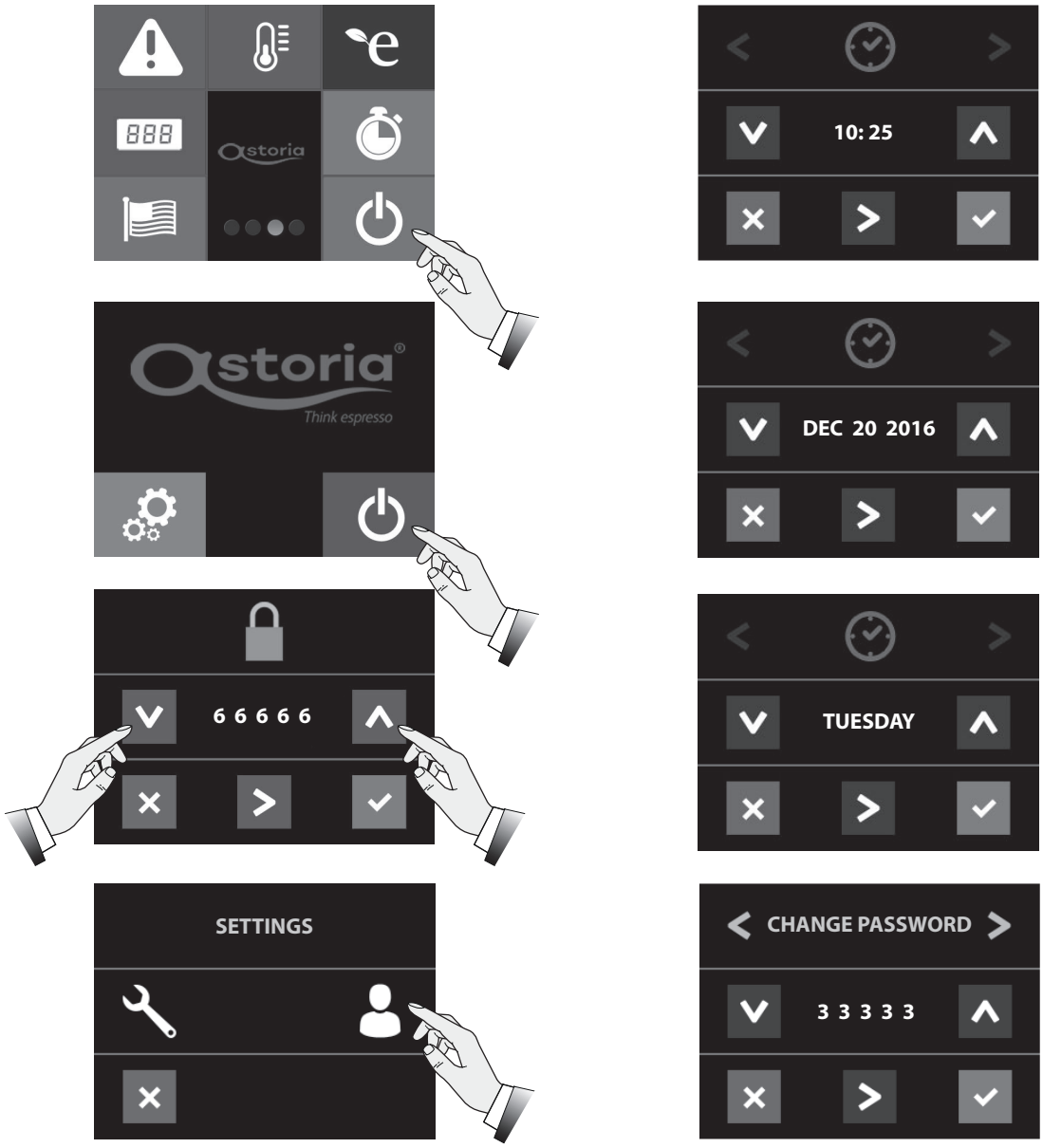
- Select the > and < arrows until the words "CHANGE PASSWORD" appear on the display;
- Use the ^ and v arrows to set the new technician password; Use the > arrow to move the cursor to the value;
- To confirm, press the ✓ button;
- To exit, press the ✕ button.





7.14.18 *Time - Date - User Password*

- Press the button and the same button again from the menu screen.
- Use the and arrows to set the access password (**6 6 6 6 6**);
- Select the icon;
- Use the and arrows to change the: time, date, day and password;
- Use the and arrows to set the value;
- Use the arrow to move the cursor to the value.
- To confirm, press the button;
- To exit, press the button.

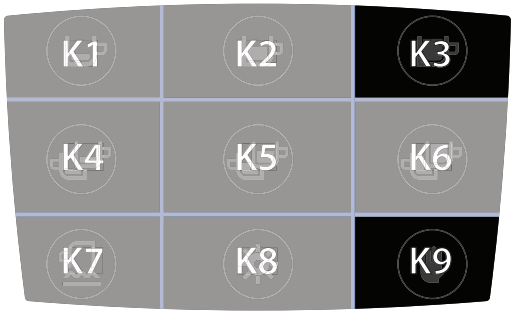


7.15 Machine Parameter Programming (Version Without DISPLAY)

To modify the function settings on this machine version (excluding cup warmer), it is necessary to activate Stand-By mode.

7.15.1 *Stand-By Activation*

- Position yourself at keypad no. 1, the one on the far right.



- Press and hold **K9** and **K3** consecutively.
  Stand-By activation is confirmed by the **blinking LED** on button **K5**.

- Proceed with parameter adjustments as described in the following sections..
- Once programming is complete, press **K5** to restart the machine.

7.15.2 *Pre-Infusion*

- Activate **Stand-By** mode (see section 7.15.1).
- Check the pre-infusion status by pressing and holding K1

- **K1** LED status:
  Blinking = Pre-infusion is **disabled**
  Solid (Activated) = Pre-infusion is **enabled**
- To change the setting, press **K1** until the LED status changes.
- To exit, press **K5** and wait for the system to restart.

7.15.3 *Enable "Continuous coffee" Button"*

- Activate **Stand-By** mode (see section 7.15.1).
- Check the status of the "Continuous coffee" button by pressing and holding **K3**:

- **K3** LED status:
  Blinking = Continuous coffee is **disabled**
  Solid (Activated) = Continuous coffee is **enabled**
- To change the setting, press **K3** until the LED status changes.
- To exit, press **K5** and wait for the system to restart.

7.15.4 *Enable Credit-Debit Function*

- Activate **Stand-By** mode (see section 7.15.1).
- Check the status of the "Credit-Debit" function by pressing and holding **K4**:

- **K4** LED status:
  Blinking = Function is **disabled**
  Solid (Activated) = Function is **enabled**
- To change the setting, press **K4** until the LED status changes.
- To exit, press **K5** and wait for the system to restart.

7.15.5 *Filling with coffee*

- Activate **Stand-By** mode (see section 7.15.1 at page 60).
- Check the status of the "Boiler Filling During Coffee Dispensing" function by pressing and holding **K6**:

- **K6** LED status:
  Blinking = Function is **disabled**
  Solid (Activated) = Function is **enabled**
- To change the setting, press **K6** until the LED status changes.
- To exit, press **K5** and wait for the system to restart.

7.15.6 *Tea Dispensing with Pump Activation*

- Activate **Stand-By** mode (see section 7.15.1 at page 60).
- Check the status of the "Boiler Filling During Coffee Dispensing" function by pressing and holding **K2**:

- **K2** LED status:
  Blinking = Function is **disabled**
  Solid (Activated) = Function is **enabled**
- To change the setting, press **K2** until the LED status changes.
- To exit, press **K5** and wait for the system to restart.

7.15.7 *Restore Default Settings*

Procedure 1

- Turn off the machine.
- Turn it on while pressing **K1**, **K2**, and **K3** for **10 seconds**.

Procedure 2

- Activate Stand-By mode (see section 7.15.1 at page 60).
- Press and hold **K1**, **K2**, and **K3** for **5 seconds** until the LEDs remain lit.
- Turn off and restart the machine.

7.16 Tips for a good cup of coffee

Wash the filters and filter holders on a daily basis, as indicated in para. 8.9.3 a pagina 73. 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.

8. MAINTENANCE AND CLEANING

8.1 Safety precautions

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

8.2 PPE features

When installing the machine, the following PPE is required:

The use of protective gloves is mandatory.

8.3 Maintenance

8.3.1 *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. The burrs 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. 6.5.	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

Component	Type of operation	Quarterly	Yearly
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. 8.3.5 - 8.3.6 - 8.3.7. 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
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.

8.3.2 *Maintenance after a short period of machine inactivity*

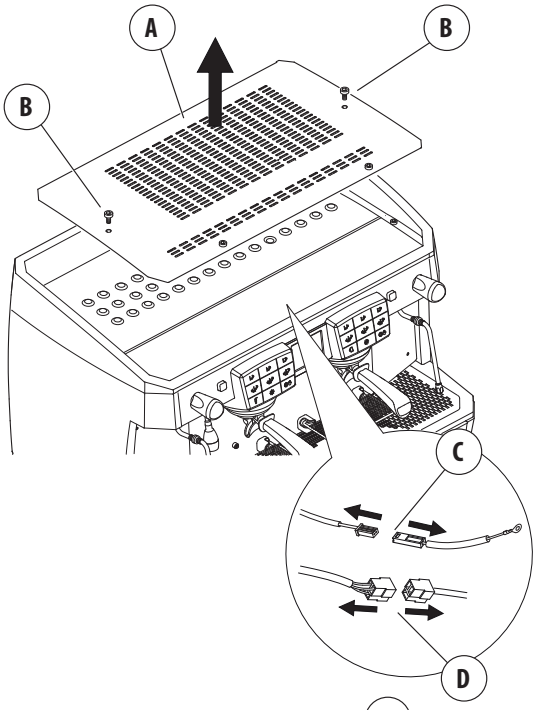
"Short period of machine inactivity" refers to a period of time exceeding one working week.
If the machine is switched back on after this period, all the water inside the hydraulic circuits must be replaced as indicated in para. 6.5.
Furthermore, all periodic maintenance operations must be carried out, see the previous paragraph.

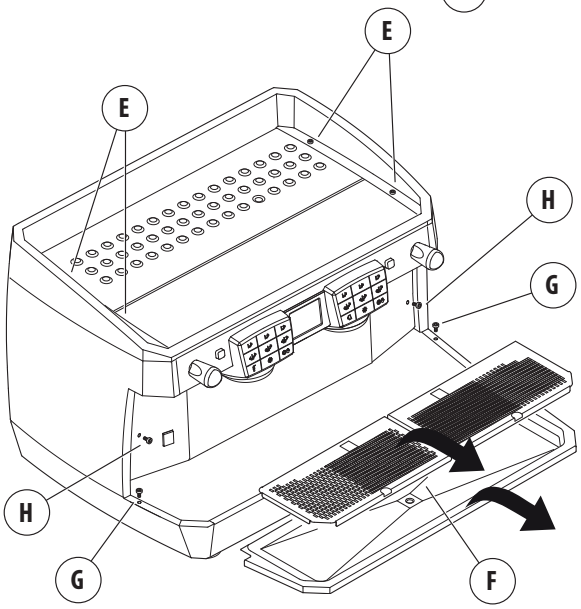
8.3.3 *Removing the machine's side panels*

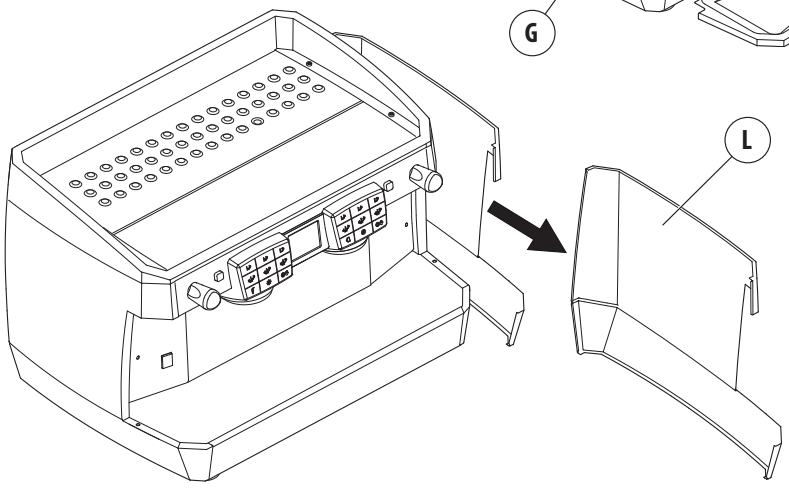
If maintenance work needs to be carried out inside the machine, correctly remove the side panels to avoid damaging them.
Proceed as follows:

- Turn the machine off.
- Unscrew the 2 screws (**B**) from the upper grille (**A**).
- Lift the upper grille (**A**) and disconnect the cup warmer heating element's power supply connector (**D**) and the temperature probe connection (**C**).
- Loosen the screws (**E**) on the top without removing them.
- Remove the tray and cup holder grille (**F**).
- Unscrew the screws under the tray (**G**).
- Unscrew the screws on the side of the appliance's cover (**H**).
- Slide the side panel (**L**) towards the front of the machine and remove it from its housing.
- Once the maintenance work has been carried out, reposition the side panel (**L**) in its original location by carrying out the steps in reverse order.

Do not carry out maintenance work when the machine is in operation or still hot.

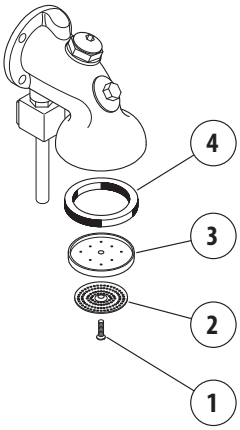






8.3.4 *Dispensing group maintenance*

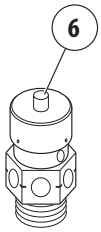
Replace the dispensing group's shower screen (**2**) and group gasket (4) on a quarterly basis (we recommend only using original spare parts), by proceeding as follows:



- 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.

8.3.5 *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.

8.3.6 *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.

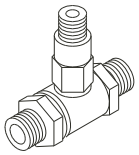
Second check:

- 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.

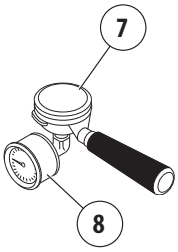
If any malfunctions are detected, the valve must be replaced.

8.3.7 *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.

8.4 Water filter maintenance

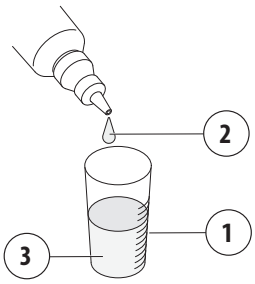
8.4.1 *Determining the water hardness*

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



8.4.2 *Bypass configuration*

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

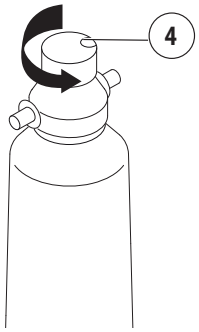
9°dKH water hardness

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

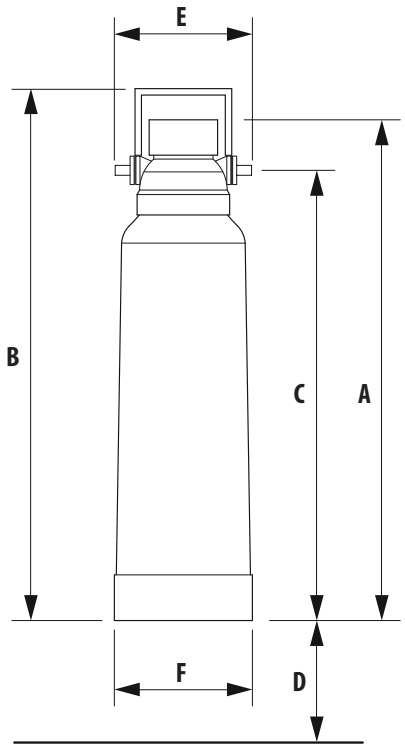
The values indicated in the table may vary, depending on the type of filter cartridge used.

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



8.4.3 *Technical data*

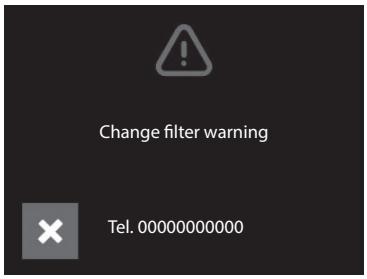
Model	V	M	L	XL
Connection coupling type	3/8"	3/8"	3/8"	3/8"
Min.-max. water supply pressure (bar)	2-8	2-8	2-8	2-8
Water temperature min. - max. (°C)	4-30	4-30	4-30	4-30
Room temperature min-max (°C)	4-40	4-40	4-40	4-40
Total height (A) without bracket (mm)	420	475	500	500
Total height (B) with bracket (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

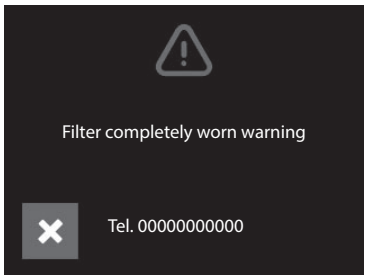


Replace the water filter cartridge at the frequency indicated by the manufacturer.

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

To reset the "Change filter warning" or the "Filter completely worn warning" on the display, follow the instructions in Chap. 9.





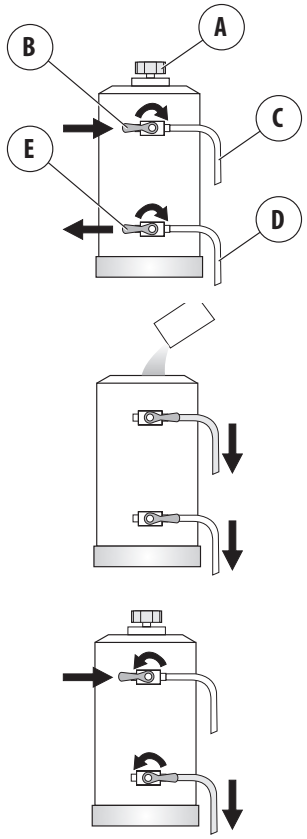
8.5 Water softener regeneration

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.

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	

Amount of softened water based on hardness					
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

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

8.6 Descaling

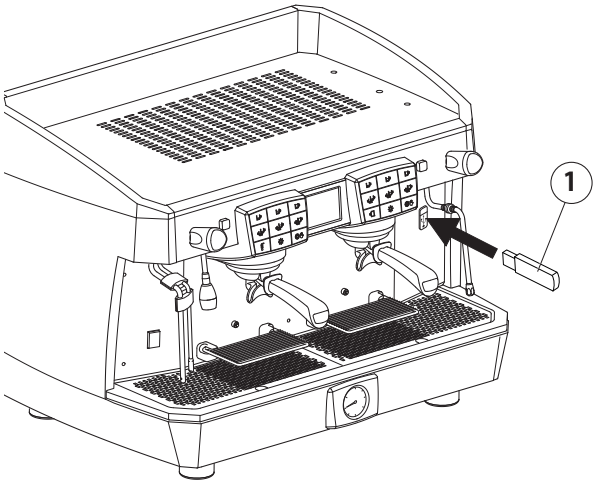
For all descaling operations on machine components, use only the RUVECO® CLEAN product supplied by the manufacturer.

In cases where an excessive amount of limescale is present in the boiler and/or in the machine's hydraulic circuit to such an extent that it hinders the correct operation of the equipment, it is necessary to carry out descaling and, if necessary, replace the affected components. The RUVECO ® CLEAN product has been specially developed for descaling coffee machines. The product is non-toxic and non-harmful, removes limescale and does not affect surfaces. For how to use the product, carefully follow the instructions on the packaging or on the manufacturer's website.

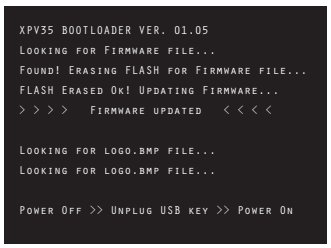
8.7 Software Update

8.7.1 *DISPLAY software update*

- Turn the machine off.
- Insert the memory stick (**1**) into the front of the machine;
- Turn the machine on again;
- Wait for the update to finish installing;
- Turn the machine off;
- Remove the memory stick (**1**) from the front of the machine and switch the machine back on.

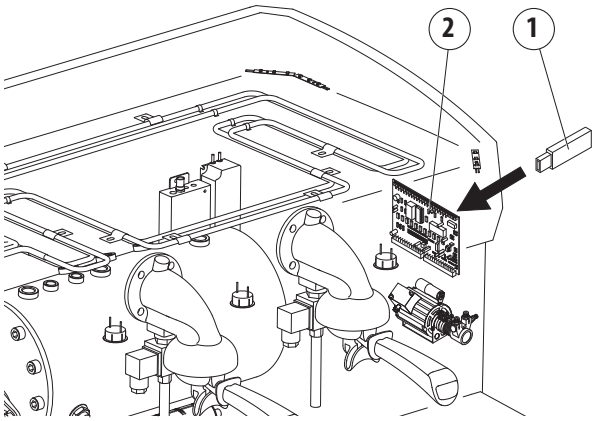


The only stick that can be used in the USB port is the USB stick provided exclusively to the Maintenance Technician. Do not connect external devices (iPhones, iPads, PCs, etc.) to the USB port because it could create serious machine software problems.

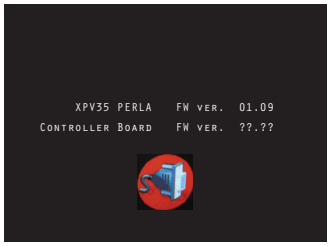


8.7.2 *Circuit Board software update*

- Turn the machine off.
- Remove the machine's right side panel;
- Remove the circuit board cover;
- Insert the memory stick (**1**) into the special port on the electronic control unit (**2**);
- Turn the machine on again;
- Wait for the update to finish installing;
- Turn the machine off;
- Remove the memory stick (**1**) from the electronic control unit;
- Reposition the circuit board cover;
- Reposition the machine's side panel and turn the machine back on.



The only stick that can be used in the USB port is the USB stick provided exclusively to the Maintenance Technician. Do not connect external devices (iPhones, iPads, PCs, etc.) to the USB port because it could create serious machine software problems.



8.8 Malfunctions and solutions

Problem	Cause	Action
NO MACHINE POWER	• 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.	• 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	• 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.	• 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	• The solenoid valve of the automatic level device is faulty. • The level probe is out of order (clogged by lime-scale).	• Replace the solenoid valve of the automatic level device. • Replace the level probe.
WATER IS LEAKING FROM THE MACHINE	• 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.	• 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 IS LEAKING FROM THE DISPENSING GROUP	• The group gasket is worn.	• Replace the group gasket.
THE GAUGE INDICATES A NON-CONFORMING PRESSURE	• The pressure gauge is faulty. • The pressure switch has been calibrated incorrectly. • The motor pump has been calibrated incorrectly.	• Replace the pressure gauge. • Adjust the pressure switch calibration. • Adjust the motor pump calibration.
THE SAFETY VALVE IS IN OPERATION	• The pressure transducer is broken. • The electronic control unit is faulty.	• 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.
NO STEAM RELEASED FROM NOZZLE	• 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.	• Turn on the machine. • Replace the electrical heating element. • Replace the temperature probe. • Clean the steam nozzle sprayer. • Reactivate or replace the thermostat.
WATER OR STEAM MIXED WITH WATER COMES OUT OF STEAM NOZZLES	• 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.	• 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	• 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.	• 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	• 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.	• Clean the group drain. • Wait until the group has fully heated up. • Adjust the coffee grinding. • Increase the amount of ground coffee.
GROUNDS FOUND IN CUPS	• 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.	• Clean the filter holder. • Replace the filter. • Replace the burrs. • Replace the seal. • Adjust the pump pressure.
THE CUP IS DIRTY WITH SPLASHES OF COFFEE	• There are steam pockets in the dispensing system. • There are air pockets in the hydraulic circuit. • The coffee has been ground too coarsely.	• Reduce the water temperature. • Check the cause and resolve the problem. • Adjust the grinder as appropriate.
COFFEE TOO COLD	• 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.	• 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: • 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.
COFFEE TOO HOT	• The heating unit temperature is too high. • The group’s flow reducer is not suitable.	• 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 DISPENSING TOO FAST	• The coffee has been ground too coarsely. • The diameter of the injector is too big. • The dose of ground coffee is too small.	• Adjust the coffee grinding. • Replace the injector with one that has a smaller diameter. • Check the amount (grams) of ground coffee being used.
COFFEE DISPENSING TOO SLOWLY	• The coffee has been ground too finely. • The injector is clogged. • The dispensing group is clogged. • The filter holder is dirty.	• Adjust the coffee grinding. • Replace the injector. • Check and clean the dispensing group. • Clean and replace the filters, if necessary.
SAE version: SHUTDOWN OF THE ELECTRONIC SYSTEM	• The control unit main fuse has burned out. • One of the volumetric dosing device's contacts is grounded.	• Replace the main fuse (125 mA). • Check the volumetric dosing device connection.
SAE version: COFFEE IS ONLY DISPENSING VIA THE MANUAL BUTTON	• The control unit fuse is burned out. • The solenoid valve coil is malfunctioning or has shorted.	• Replace the control unit fuse (1A). • Replace the coil of the solenoid valve.

Problem	Cause	Action
SAE version: COFFEE DISPENSING IN INCONSISTENT MANNER THE COFFEE DOSE IS NOT CONSISTENT WITH SET VALUES THE DOSE BUTTON LED IS FLASHING	• 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.	• 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 burrs, 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.
SAE version: THE LEDS OF ALL THE PUSHBUTTON PANELS ARE FLASHING AEP version: THE FRONT PANEL LED IS FLASHING	• 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.	• 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.
UNEVEN AMOUNTS OF MILK ARE DISPENSING FROM THE CAPPUCCINO MAKER	• 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.	• Refill the milk. • Clean the milk injector. • Clean the cappuccino maker with the brush. • Clean the milk suction hose. • Connect the hose correctly.
THERE ARE AIR POCKETS IN THE MILK FROTH FROM THE CAPPUCCINO MAKER	• The air regulator is open too much. • The air suction hose is disconnected from the cappuccino maker.	• Properly calibrate the air regulator. • Restore the connection via the hose.
THE PUMP WORKS ONLY WITH THE MANUAL DISPENSING BUTTON	• The pump fuse of the electronic control unit is burned out.	• Replace the pump fuse of the electronic control unit (10A).
COFFEE DISPENSING IN INCONSISTENT MANNER THE COFFEE DOSE IS NOT CONSISTENT WITH SET VALUES	• 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.	• 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 burrs, if necessary. • Clean and replace the solenoid valve, if necessary. • Clean or replace the volumetric dosing device.
BUBBLES IN THE MILK FROTH	• The air regulator is open too much. • The air suction hose is disconnected from the cappuccino maker. • The frothed milk is too hot.	• 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.

8.9 Cleaning operations

8.9.1 *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.
For all the cleaning operations of the machine components, only use the following detergents supplied by the Manufacturer:

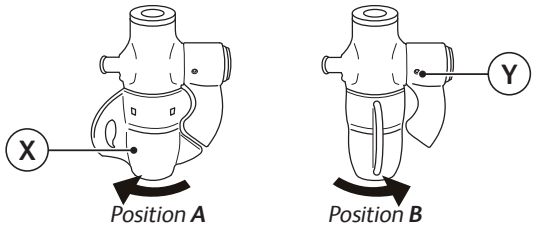
- **EVO ® ESPRESSO MACHINE**
- **MFC ® BLUE MILK**

Cleaning	Daily	Weekly
Cappuccino maker: Clean at least once a day or more often if the cappuccino maker is used constantly, by following the instructions in para. 8.9.2 a pagina 73.	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. 8.9.3 a pagina 73. Perform the cleaning operations on a daily basis as indicated in para. 8.9.5 .	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. Perform the wash on a weekly basis, as indicated in para. 8.9.6 a pagina 74.	X	X
Dispensing group: Wash the dispensing group as described in para. 8.9.4 Perform the cleaning operations on a daily basis as indicated in para. 8.9.5. Internally clean the group on a weekly basis, as indicated in para. 8.9.5 a pagina 74.	X	X
Grinder-dispenser and Hopper: Clean the hopper and the dispenser inside and out with a cloth dampened with warm water. When finished, dry all parts thoroughly.		X

8.9.2 *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.



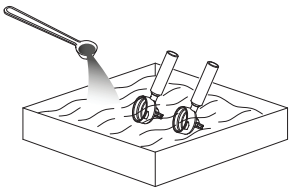
Clean the cappuccino maker after each continuous use and at least once a day.

8.9.3 *Cleaning the filters and filter holders*

Caution: only immerse the filter holder cup in water and try not to get the handle wet.

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:

For the weekly cleaning of the filters and filter holders, use the EVO ® detergent diluted in water according to the procedures indicated on the packaging or on the manufacturer's website.

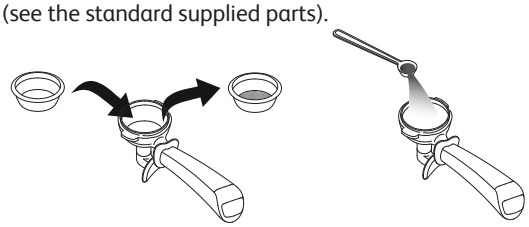
8.9.4 *Washing the dispensing group*

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

Use the EVO ® detergent according to the procedures indicated on the packaging or on the manufacturer's website.

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 1 level scoop of EVO ® detergent into the blind filters and hook the filter holders to the dispensing units.

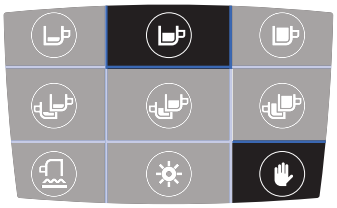
From here on, follow the instructions specific to your machine.

"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-DISPLAY" version

- On the pushbutton panel of the group being washed, simultaneously hold down the following buttons (and).

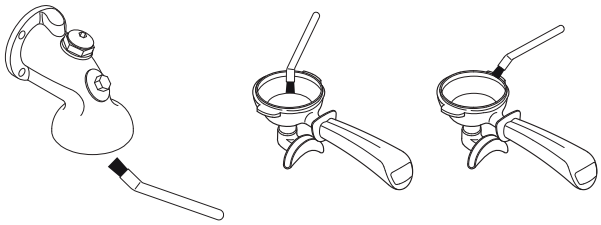


- Wait for the 5 automatic rinse cycle to completely finish (this takes roughly 30 seconds).
- Remove the filter holder and press the button to start the approx. 30-second rinsing cycle.

8.9.5 *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.

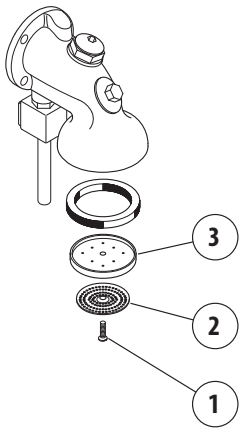


Use the special brush supplied (see the Spare Parts Catalogue).

Weekly

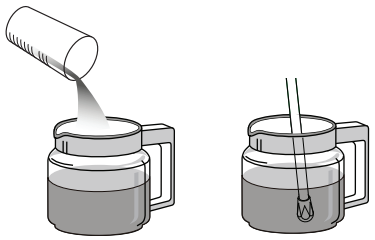
Clean the shower screen and shower screen containment ring as follows:

- 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.



8.9.6 *Cleaning the steam nozzle*

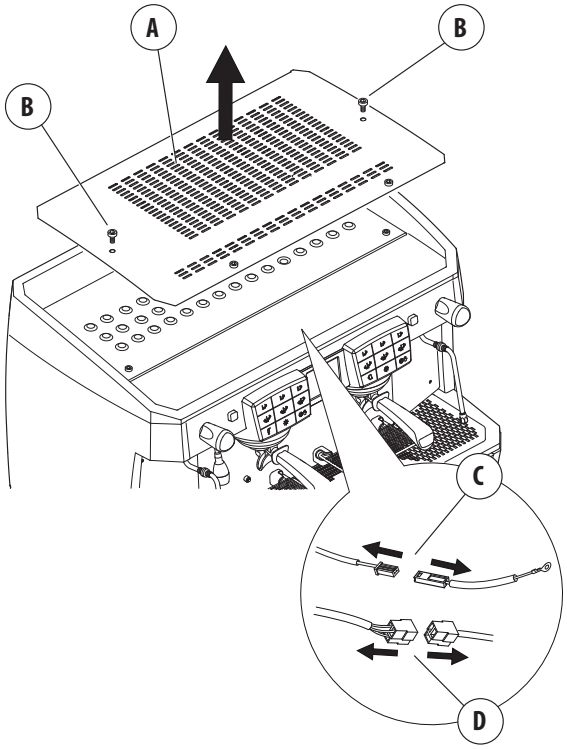
For the weekly cleaning of the steam nozzle, use the MFC ® detergent diluted in water according to the procedures indicated on the packaging or on the manufacturer's website.

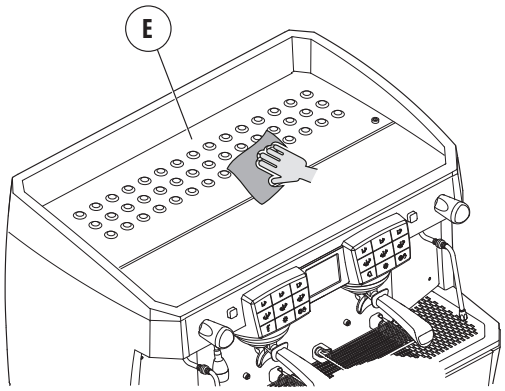


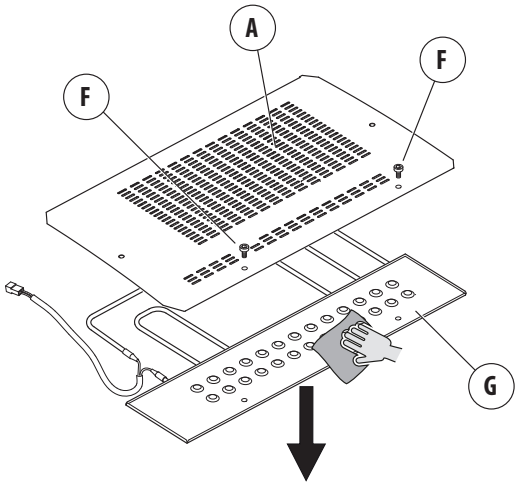
8.9.7 *Cleaning the drip tray*

Periodically clean the drip tray as follows:

- Unscrew 2 screws (**B**) from the upper grille (**A**).
- Lift the upper grille (**A**) and disconnect the cup warmer heating element's power supply connector (**D**) and the temperature probe connection (**C**).
- Clean the rear drip tray (**E**) - secured to the machine - with a cloth dampened in lukewarm water.
- Unscrew the screws (**F**) by detaching the front drip tray (**G**) from the grill (**A**).
- Clean the front drip tray (**G**) with a cloth dampened in lukewarm water.
- Once the maintenance work has been carried out, reposition all the components in their original location by carrying out the steps in reverse order. Restore the electrical mains connections of the cup warmer heating element and the temperature probe.







9. DISPLAY WARNINGS

Select the ⚠ button to see the machine's current warnings.
The table below lists the probable causes and solutions for each warning.

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

WARNING	CAUSE	ACTION
Steam heating unit temperature probe has overheated or short-circuited	• Heating unit temperature probe is disconnected or faulty.	• Check the heating unit probe connection and if necessary, replace it.
Steam heating unit temperature probe is disconnected or cut off	• Heating unit temperature probe is disconnected or faulty.	• Check the heating unit probe connection and if necessary, replace it.
Cup warmer temperature probe has overheated or short-circuited	• The cup warmer temperature probe is disconnected. • The temperature probe has short-circuited. • The cup warmer has overheated.	• Check the cup warmer probe connection and if necessary, replace it.
Cup warmer temperature probe is disconnected or cut off	• The cup warmer temperature probe is disconnected. • The temperature probe has short-circuited. • The cup warmer has overheated.	• Check the cup warmer probe connection and if necessary, replace it.
The steam nozzle probe has short-circuited	• The steam nozzle temperature probe is disconnected. • The steam nozzle temperature probe has short-circuited. • The steam nozzle temperature probe has overheated.	• Check the steam nozzle temperature probe connection and if necessary, replace it.
The steam nozzle probe is disconnected or cut off	• The steam nozzle temperature probe is disconnected. • The steam nozzle temperature probe has short-circuited. • The steam nozzle temperature probe has overheated.	• Check the steam nozzle temperature probe connection and if necessary, replace it.
Fillingup timeout warning	• The heating unit did not fill up completely within the maximum time. • The level probe does not detect any water.	• Check the hydraulic circuit which fills the heating unit. • Check that there is water in the water mains. • Check the filling solenoid valve/pump filter. • Check the control unit fuse.
Warning data is corrupted	• A circuit board problem.	• Contact the Manufacturer.
Change filter warning (90 % worn)	• The amount of water used by the machine has almost been reached for the filter.	• Replace the water filter. To reset the warning on the display, follow the instructions in para. . 8.1.
Filter completely worn warning	• The amount of water used by the machine has been reached for the filter.	• Replace the water filter. To reset the warning on the display, follow the instructions in para. . 8.1.
Maintenance warning	• The number of machine work cycles has been reached, so maintenance is due.	• Carry out the envisaged maintenance operations.
Heating unit heating timeout warning	• The heating unit's heating circuit is disconnected. • The heating unit's heating element has burned out. • The safety thermostat is open. • The fuse has burned out.	• Check the heating unit's heating: heating element; safety thermostat; fuses and control unit; main switch; connection for the three-phase version. • If necessary, replace the faulty components.
Volumetric counter warning for each group	• The volumetric dosing device is not counting the water.	• Check the volumetric dosing device connection. • Check that there is water in the water mains. • Check the pump filter / volumetric dosing device filter. • Check the group jet. • Check the volumetric dosing device jet.

10. 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.

11. DECOMMISSIONING

11.1 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.

11.2 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.

12. DISASSEMBLY

To disassemble the machine, follow the installation procedure in reverse order - see chap. "5. INSTALLATION" on page 21.
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. "13. DISPOSAL" on page 76.

13. DISPOSAL

13.1 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.

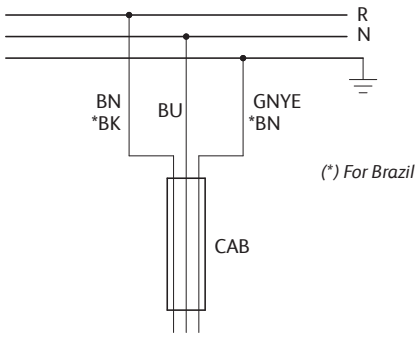
Before disposing of the machine, we recommend seeking advice from the Technician and/or the seller.

13.2 Environmental information

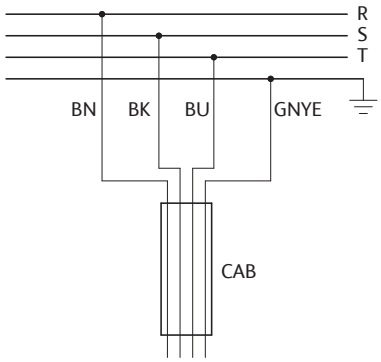
The machine features an internal lithium button battery, which is located in the circuit board and ensures data storage. Dispose of the battery in accordance with current national regulations.

14. WIRING DIAGRAMS

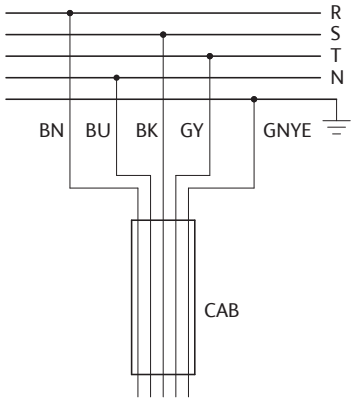
14.1 ELECTRIC MAINS connection



3-CONDUCTOR CABLE (Phase+Neutral+Earth)



4-CONDUCTOR CABLE (3 Phase+Earth)



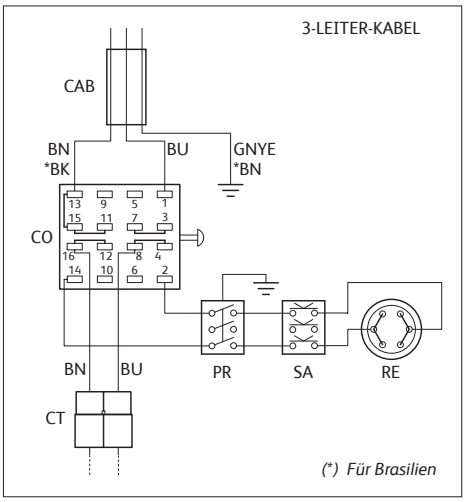
5-CONDUCTOR CABLE (3 Phase+Neutral+Earth)

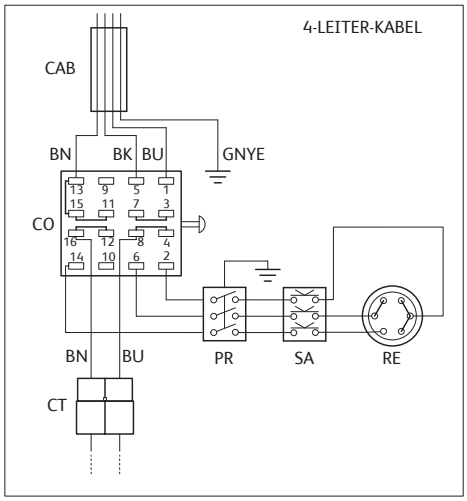
R	Phase
S	Phase
T	Phase
N	Neutral
⏚	Earth
BU	Blue
CAB	Power cable
GY	Grey
GNYE	Yellow-green
BN	Brown
BK	Black

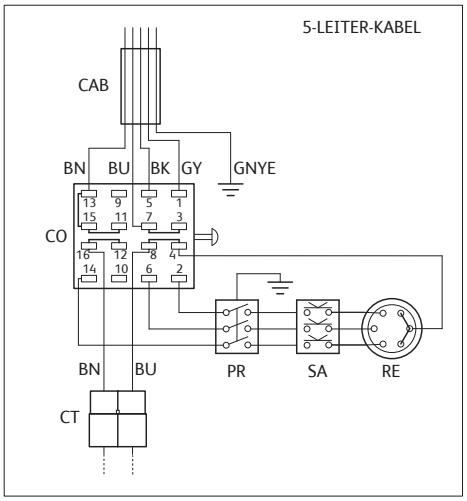
To correctly connect the machine to the electric mains, please refer to the information provided on the nameplate (see the example in paragraph 2.7).

14.2 MACHINE Power Supply

14.2.1 *AL-AEP-SAE version*

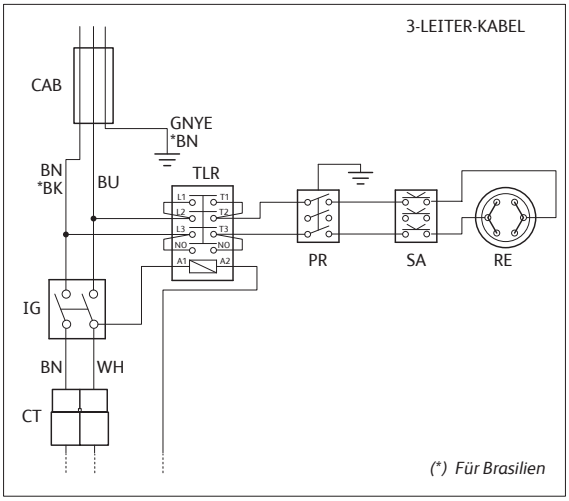


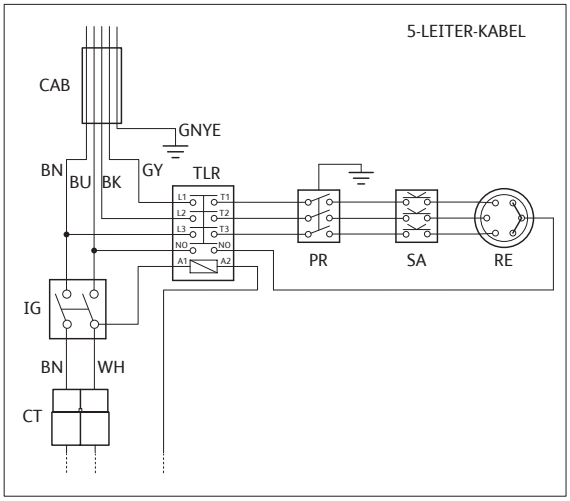




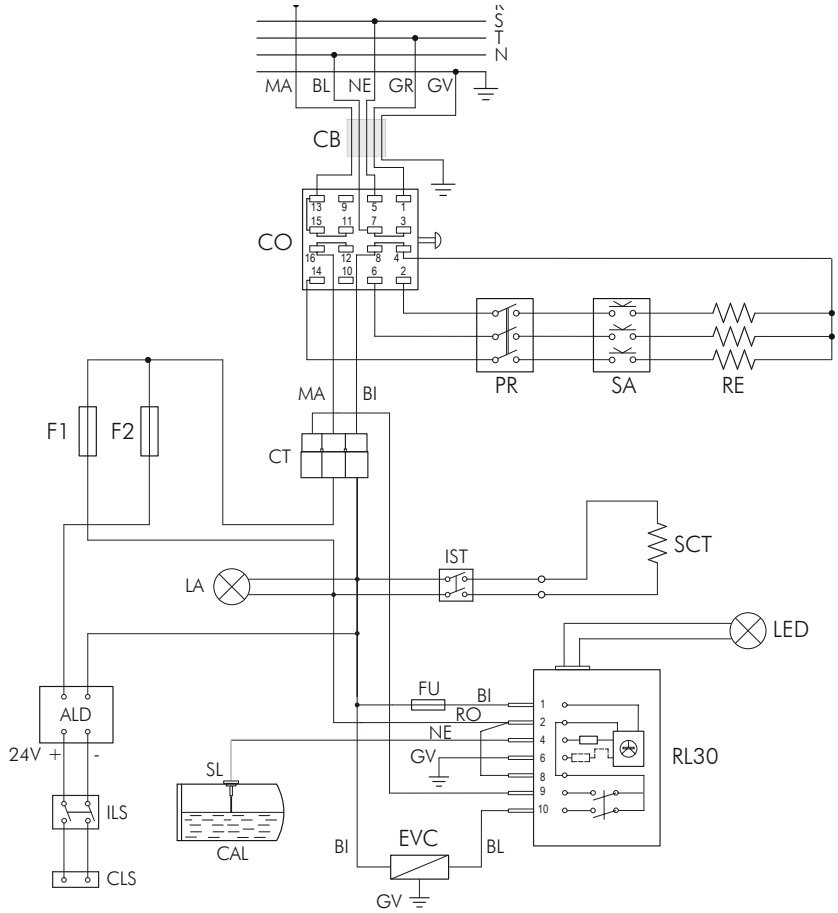
R	Phase
S	Phase
T	Phase
N	Neutral
⏚	Earth
BU	Blue
CAB	Power cable
CO	Power switch
CT	Connector
GY	Grey
GNYE	Yellow-green
IG	Main switch
BN	Brown
BK	Black
PR	Pressure switch
RE	Heating element
SA	Safety heating element
TLR	Remote switch
WH	White

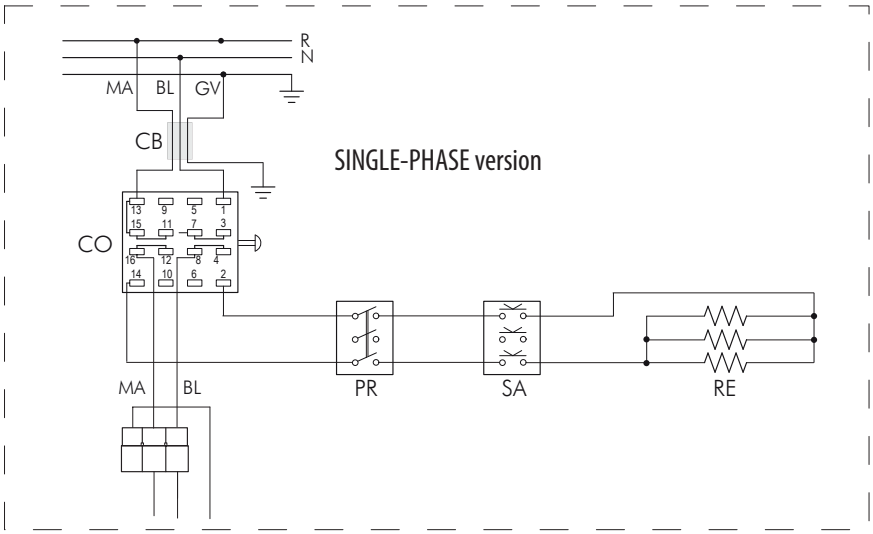
14.2.2 *DISPLAY version*





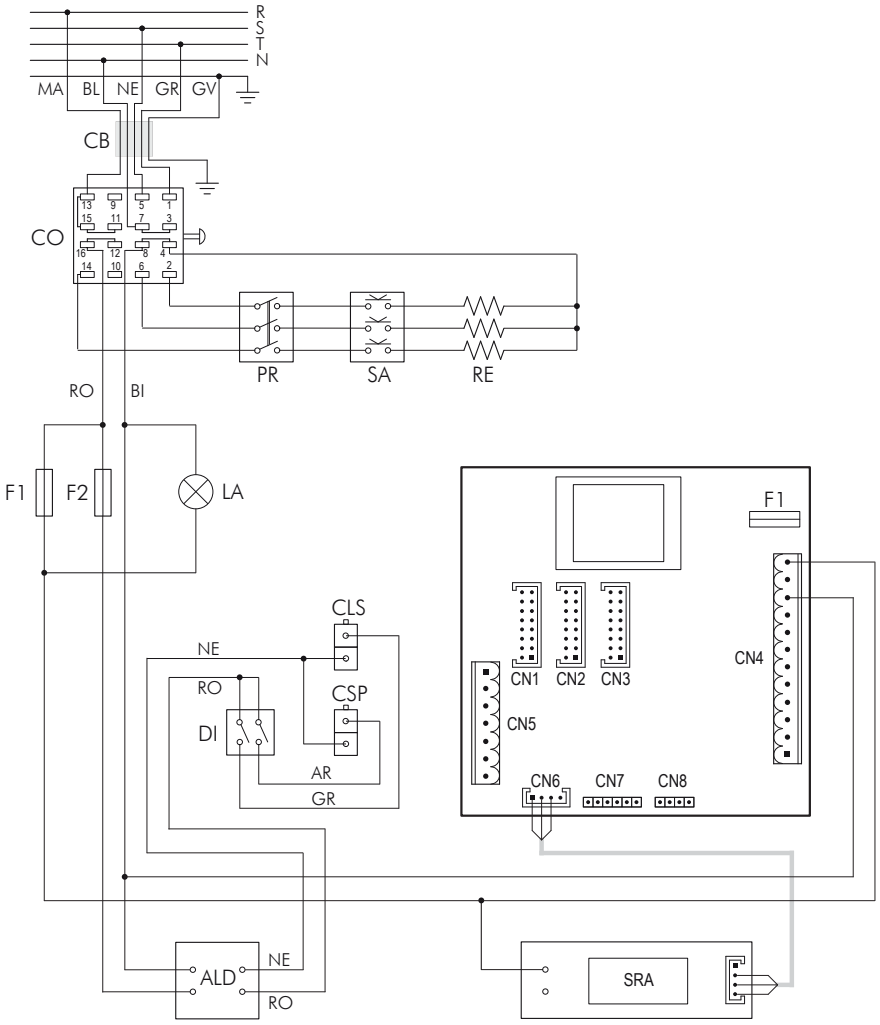
14.3 AL version



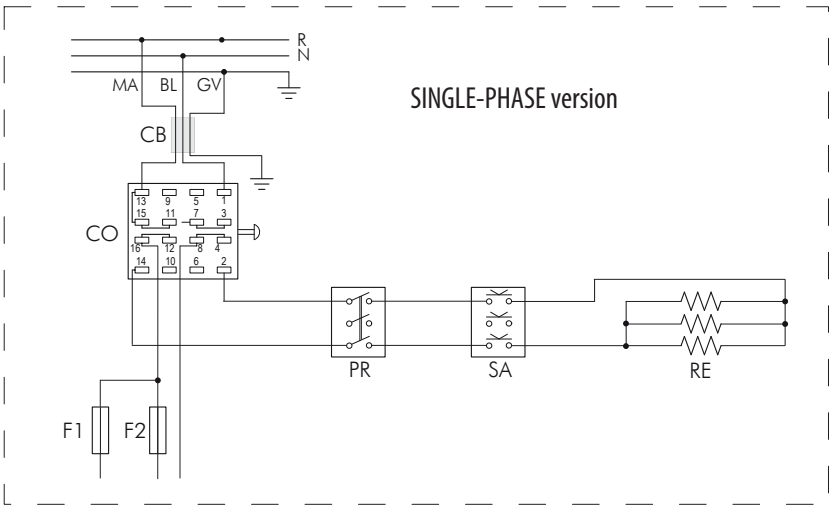


ALD	Cup warmer LED power supply
BI	White
BL	Blue
CAL	Heating unit
CB	Wiring
CO	Power switch
CLS	Cup warmer LED connector
CT	Connector
EVC	Heating unit filling solenoid valve
F1	10 A fuse
F2	6.3 A fuse
GR	Grey
GV	Yellow green
ILS	Cup warmer LED switch
IST	Cup warmer switch
LA	Light switched on
LED	Timeout LED
MA	Brown
N	Neutral
NE	Black
PR	Pressure switch
R	Phase
RE	Heating unit heating element
RL30	AEA control unit
RO	Red
S	Phase
SA	Heating element protection thermostat
SCT	Cup warmer heating element
SL	Heating unit level probe
T	Phase

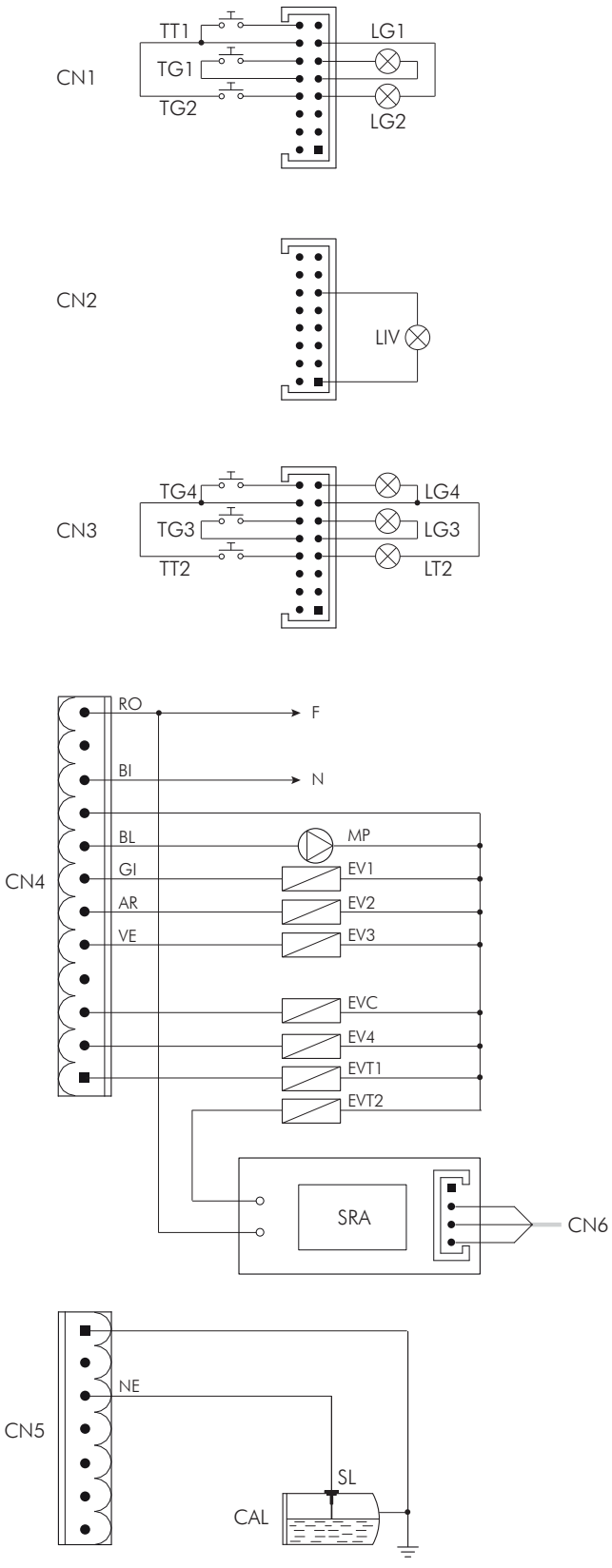
14.4 AEP version



ALD	LED power supply
BI	White
BL	Blue
CB	Wiring
CLS	Cup warmer LED connector
CO	Power switch
CSP	LED spotlight connector
CT	Connector
DI	Double switch
F1	10 A fuse
F2	6.3 A fuse
GR	Grey
GV	Yellow green
LA	Light switched on
MA	Brown
N	Neutral
NE	Black
PR	Pressure switch
R	Phase
RE	Heating unit heating element
RO	Red
S	Phase
SA	Heating element protection thermostat
SRA	Auxiliary relay board
T	Phase

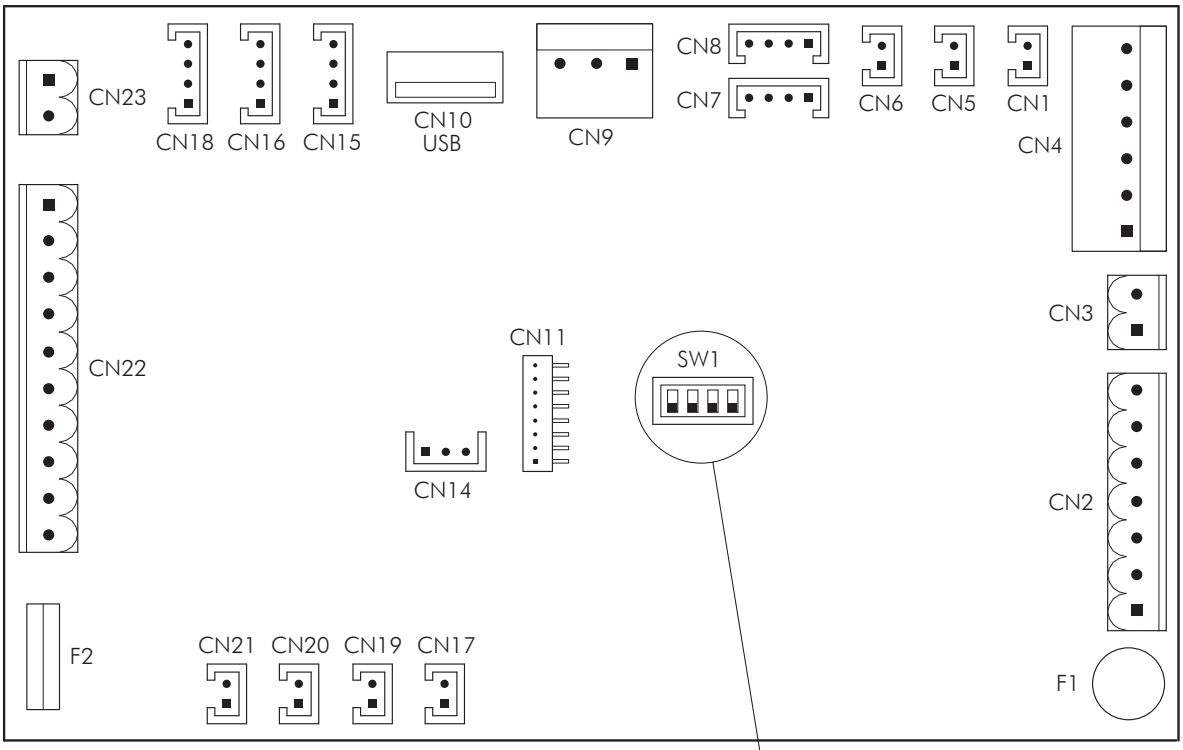


14.5 AEP connector connection

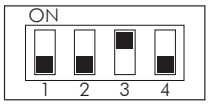


AR	Orange
BI	White
BL	Blue
CAL	Heating unit
EV1	GR1 dispensing solenoid valve
EV2	GR2 dispensing solenoid valve
EV3	GR3 dispensing solenoid valve
EV4	GR4 dispensing solenoid valve
EVC	Heating unit filling solenoid valve
EVT1	Tea dispensing solenoid valve 1
EVT2	Tea dispensing solenoid valve 2
F	Phase
GI	Yellow
LG1	GR1 light
LG2	GR2 light
LG3	GR3 light
LG4	GR4 light
LIV	Level warning light
MP	Motor pump
N	Neutral
NE	Black
RO	Red
SL	Level probe
SRA	Auxiliary relay board
TG1	GR1 button
TG2	GR2 button
TG3	GR3 button
TG4	GR4 button
TT1	Tea button 1
TT1	Tea button 2
VE	Green

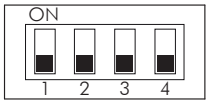
14.6 Circuit Board Diagram



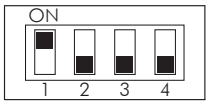
CN1	NTC Cup warmer
CN2	Power supply
CN3	Work surface LED power supply
CN4	Volumetric dosing devices
CN5	NTC Automatic Steam wand
CN6	NTC Heating unit
CN7	Steam pressure (4 bar)
CN8	Dispensing pressure (16 bar)
CN9	Heating unit level probe
CN10	USB port
CN11	Dose Prog.
CN14	Cup warmer LED power supply
CN15	Pushbutton panel connection
CN16	Display connection
CN17	Air pump - Static relay
CN18	RS232 socket
CN19	SSR heating unit heating element 2
CN20	SSR heating unit heating element 1
CN21	Level warning light
CN22	Dispensing, filling, tea + motor pump solenoid valves
CN23	Cup warmer



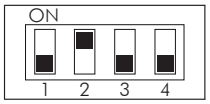
1 GR - COMPACT



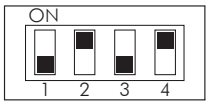
2-3-4 GR without display



2-3-4 GR with display

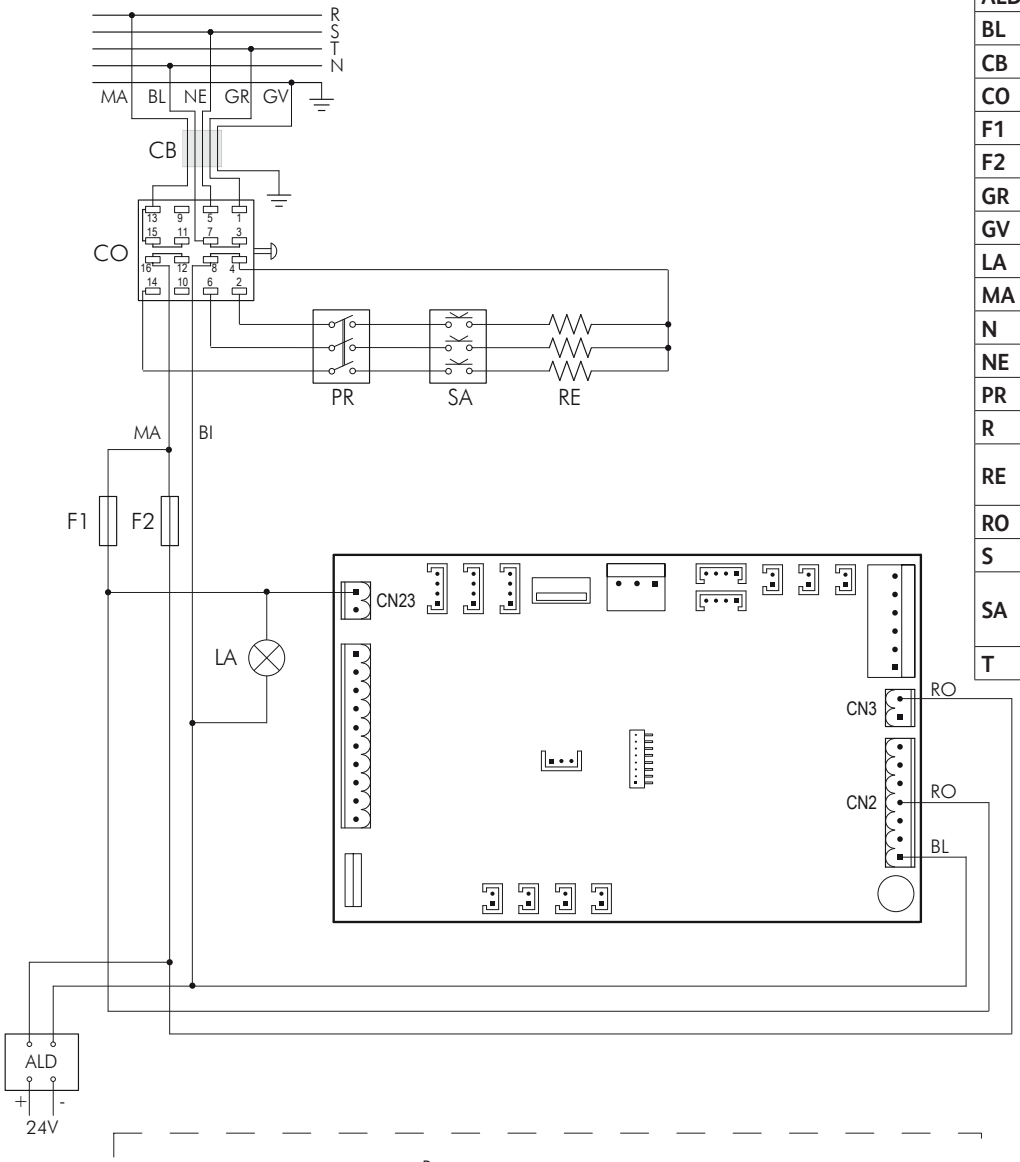


Enabling the RS 232 standard serial line

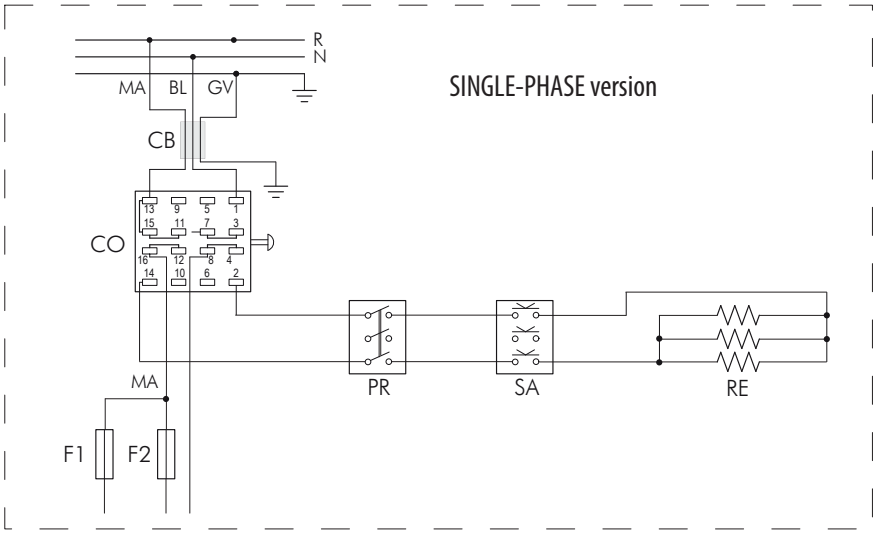


Enabling the serial line with the MOD-BUS Telemetry protocol

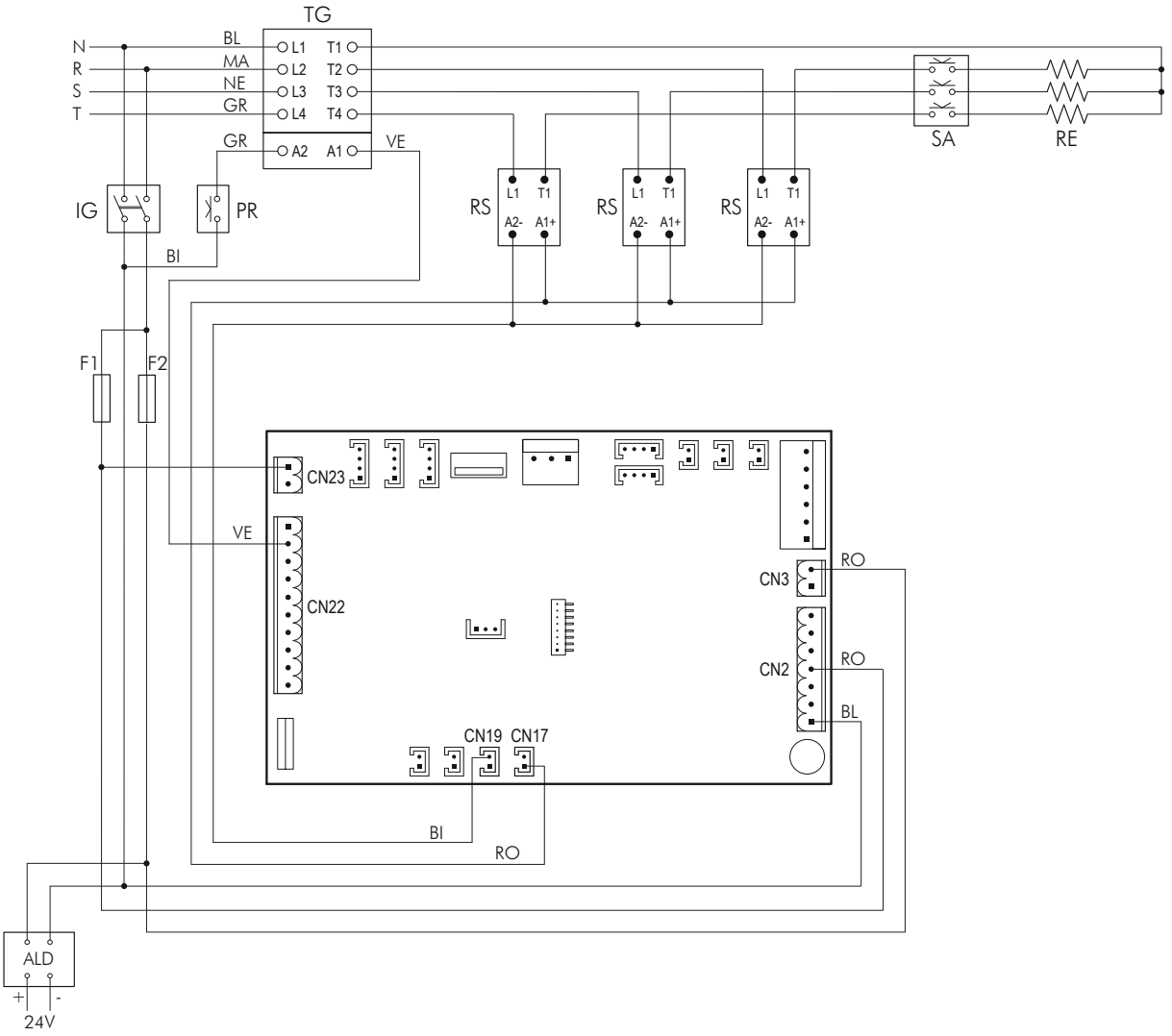
14.7 SAE version connection

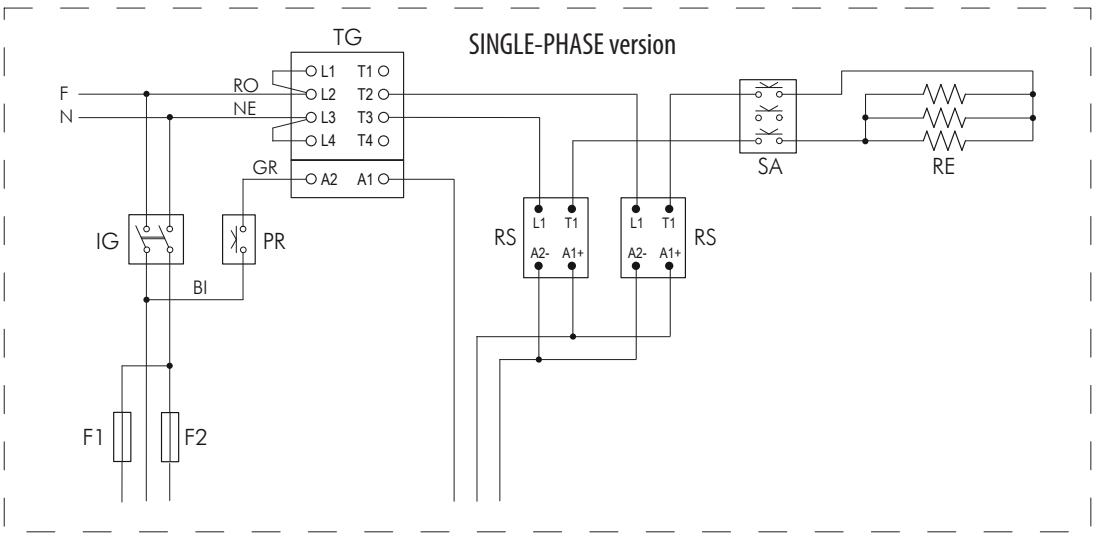


ALD	LED power supply
BL	Blue
CB	Wiring
CO	Power switch
F1	10 A fuse
F2	6.3 A fuse
GR	Grey
GV	Yellow green
LA	Light switched on
MA	Brown
N	Neutral
NE	Black
PR	Pressure switch
R	Phase
RE	Heating unit heating element
RO	Red
S	Phase
SA	Heat. elem. protect. thermostat
T	Phase

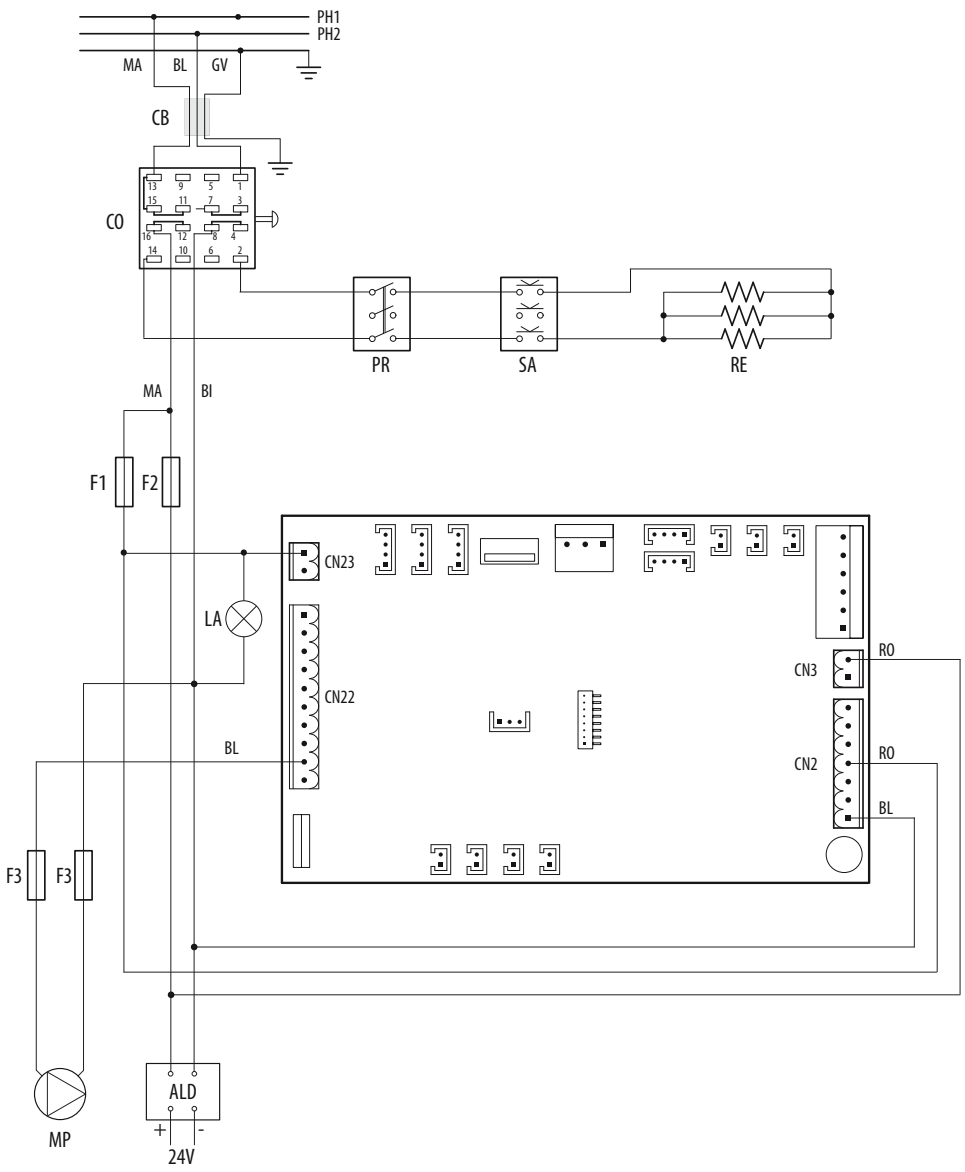


14.8 DISPLAY version connection



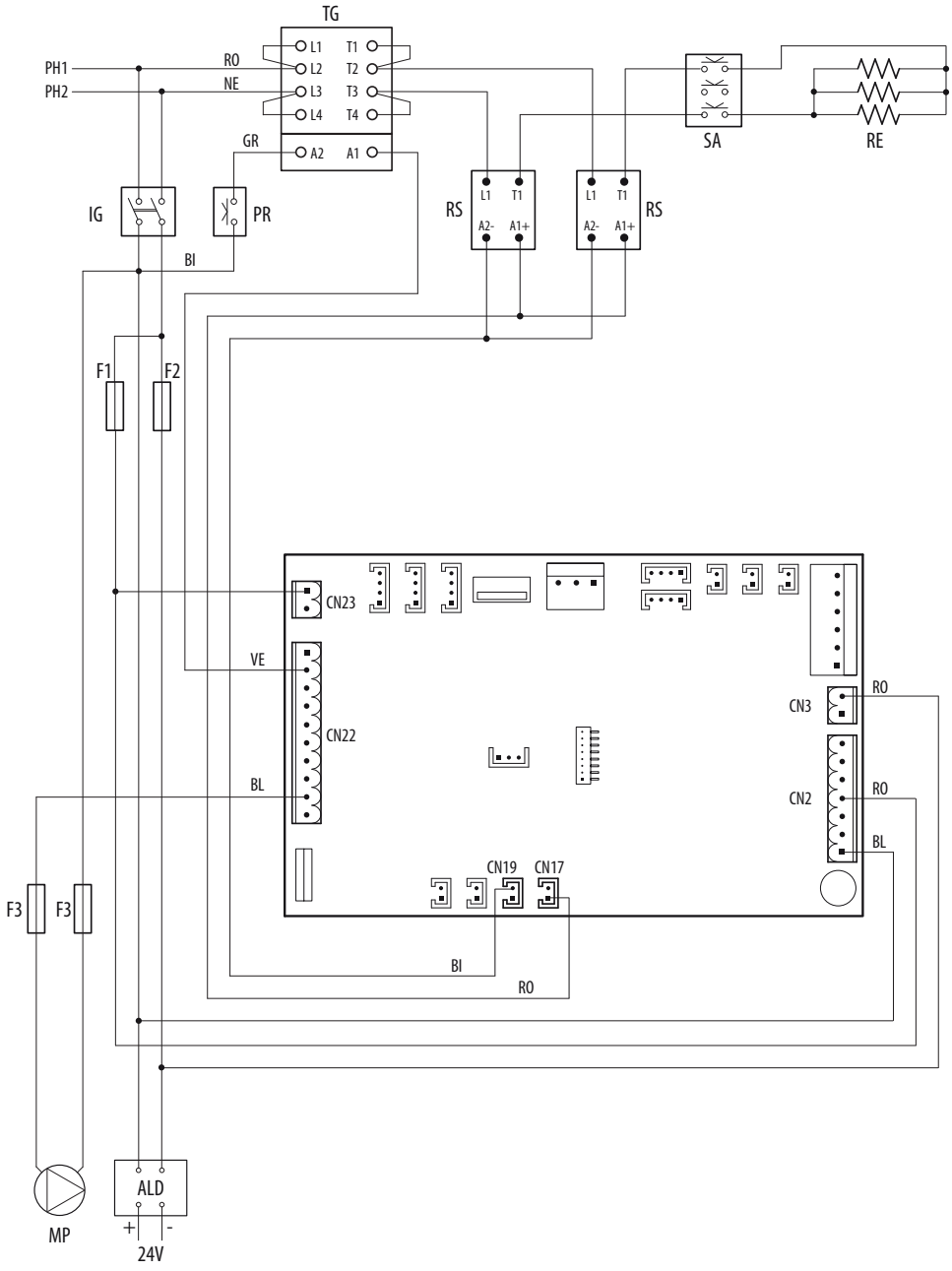


14.9 SAE -UL- version connection



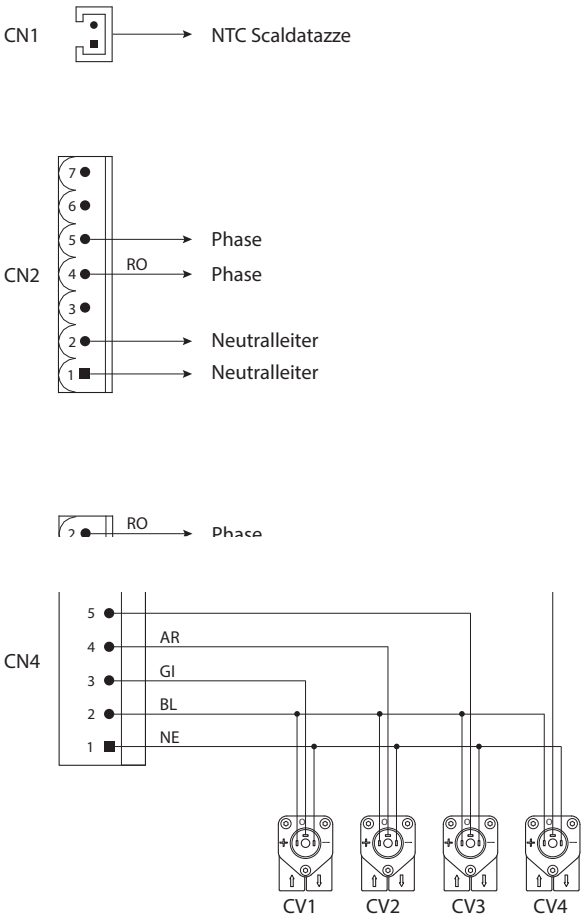
ALD	LED power supply
BL	Blue
CB	Wiring
CO	Power switch
F1	10 A fuse
F2	6.3 A fuse
F3	16 A fuse Class C
GR	Grey
GV	Yellow green
LA	Light ON
MA	Brown
MP	Motor pump
N	Neutral
NE	Black
PH1	Phase 1
PH2	Phase 2
PR	Pressure switch
R	Phase
RE	Heating unit heating element
RO	Red
S	Phase
SA	Heating element protection thermostat
T	Phase

14.10 DISPLAY -UL- version connection

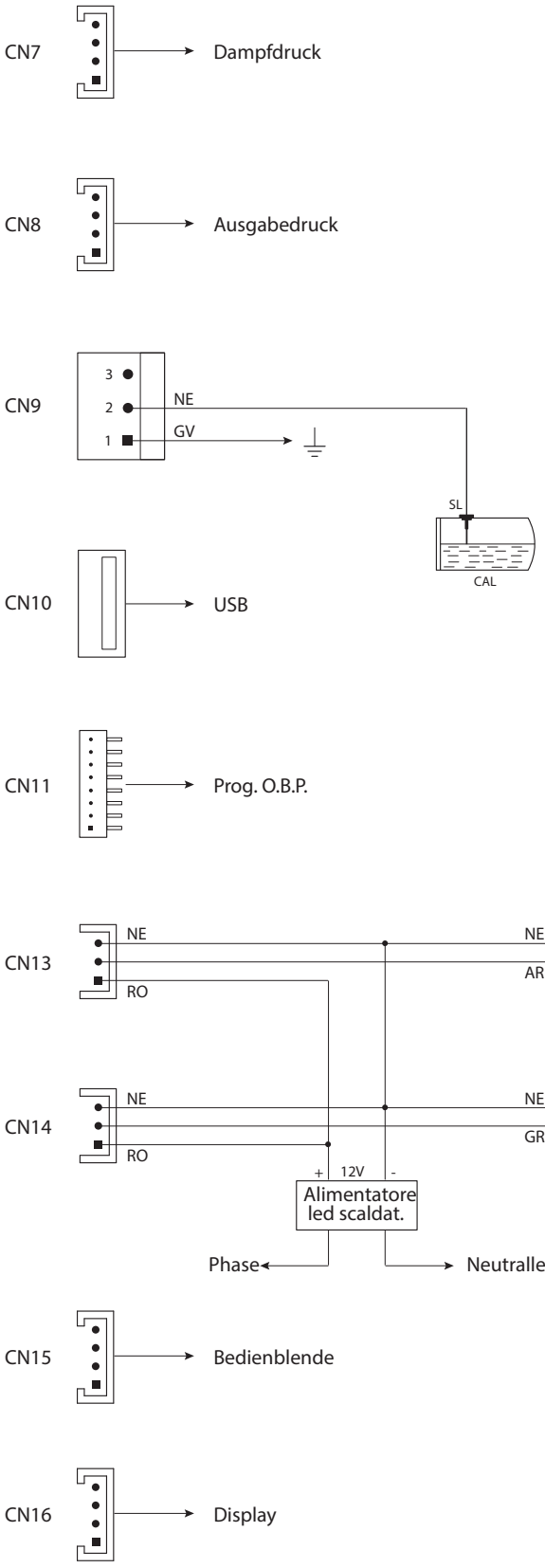


ALD	LED power supply
BI	White
BL	Blue
F1	10 A fuse
F2	6.3 A fuse
F3	15 A fuse Class C
GR	Grey
IG	Main switch
MA	Brown
MP	Motor pump
N	Neutral
NE	Black
PH1	Phase 1
PH2	Phase 2
PR	Pressure switch
R	Phase
RE	Heating unit heating element
RS	Static relay
RO	Red
S	Phase
SA	Heating element protection thermostat
T	Phase
TG	Remote switch
VE	Green

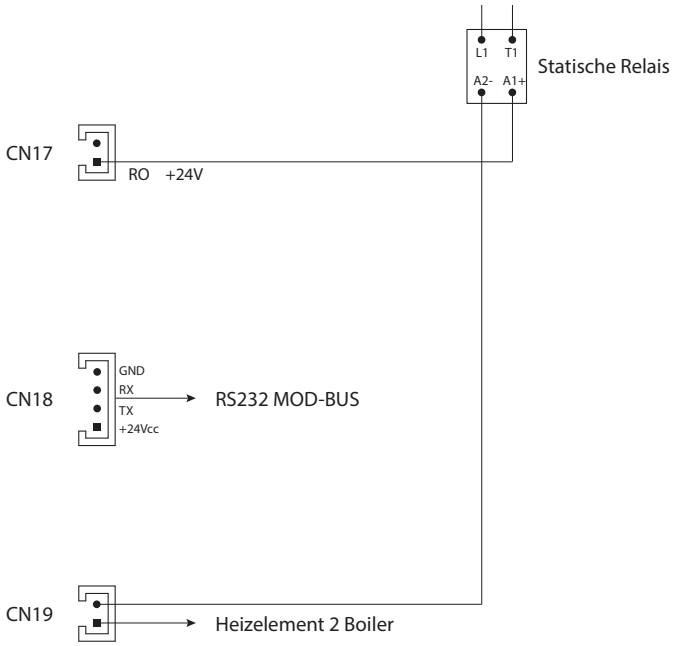
14.11 DISPLAY connector connection



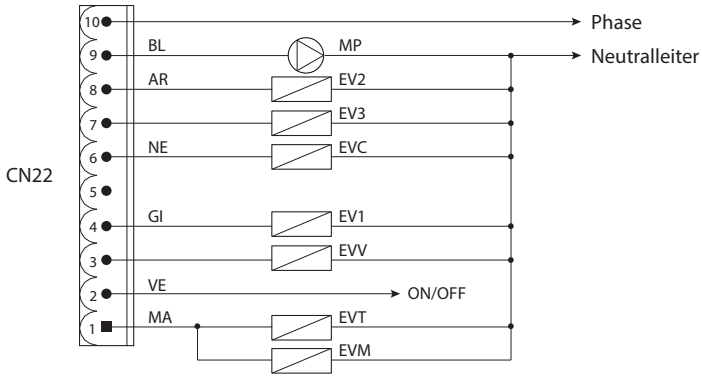
AR	Orange
BL	Blue
CV1	GR1 volumetric counter
CV2	GR2 volumetric counter
CV3	GR3 volumetric counter
CV4	GR4 volumetric counter
GI	Yellow
NE	Black
RO	Red

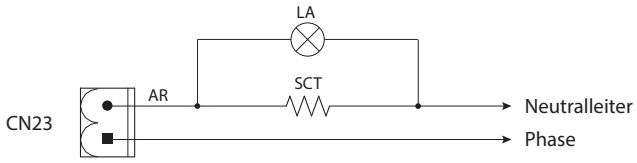


AR	Orange
BI	White
BL	Blue
EV1	GR1 dispensing solenoid valve
EV2	GR2 dispensing solenoid valve
EV3	GR3 dispensing solenoid valve
EV4	GR4 dispensing solenoid valve
EVC	Heating unit filling solenoid valve
EVM	Mixed water solenoid valve
EVT	Tea dispensing solenoid valve
EVV	Steam dispensing solenoid valve
GI	Yellow
LA	Cup warmer warning light
LIV	Level warning light
MA	Brown
MP	Motor pump
NE	Black
RO	Red
SCT	Cup warmer heating element
VE	Green

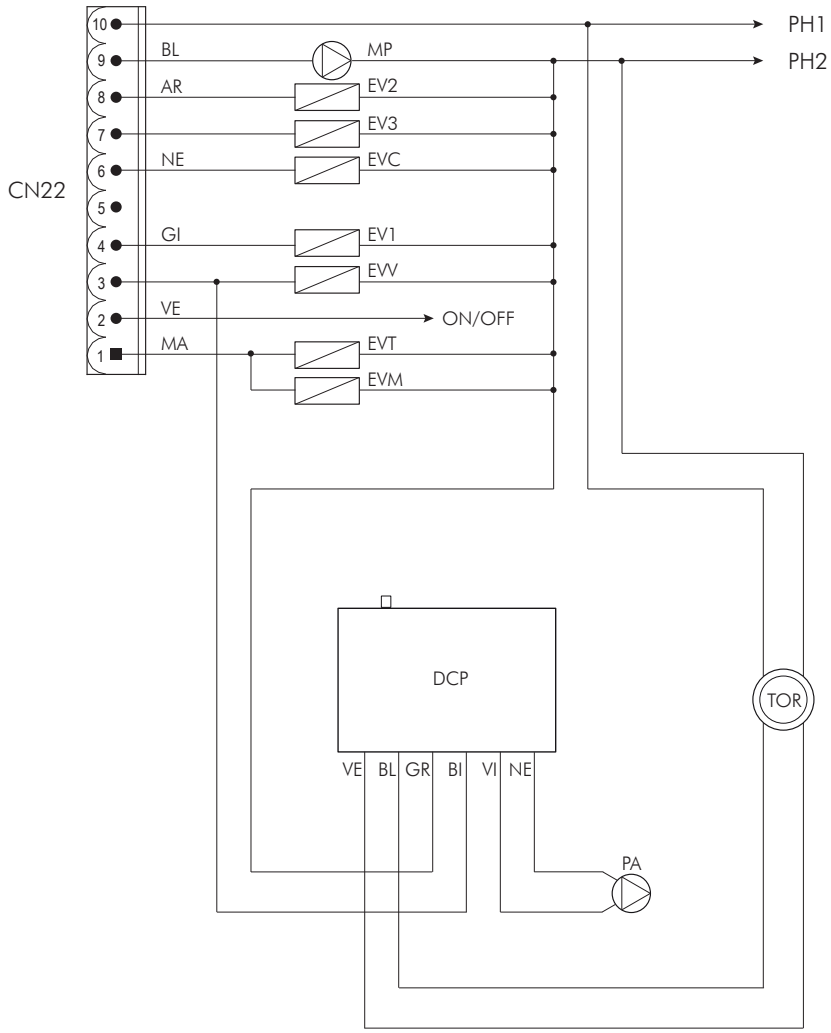


AR	Orange
BI	White
BL	Blue
EV1	GR1 dispensing solenoid valve
EV2	GR2 dispensing solenoid valve
EV3	GR3 dispensing solenoid valve
EV4	GR4 dispensing solenoid valve
EVC	Heating unit filling solenoid valve
EVM	Mixed water solenoid valve
EVT	Tea dispensing solenoid valve
EVV	Steam dispensing solenoid valve
GI	Yellow
LA	Cup warmer warning light
LIV	Level warning light
MA	Brown
MP	Motor pump
NE	Black
RO	Red
SCT	Cup warmer heating element
VE	Green





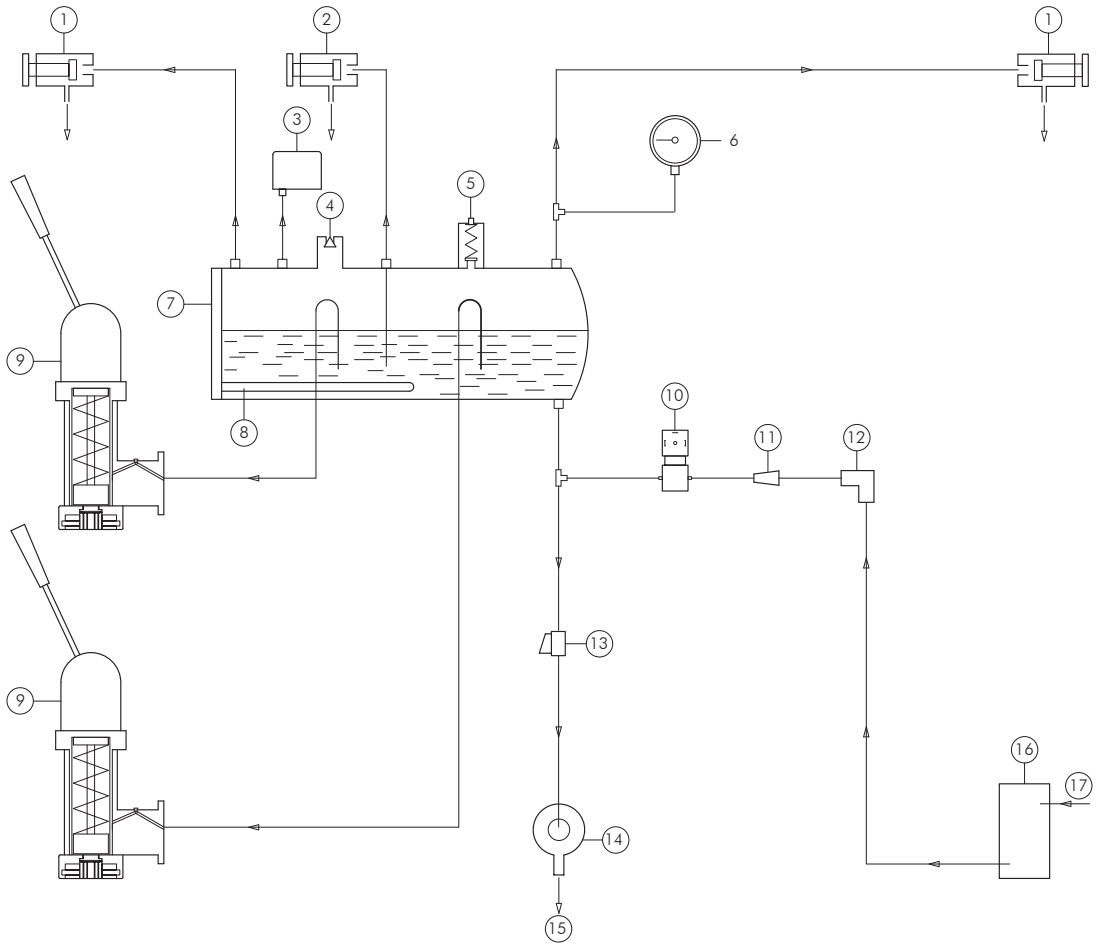
14.12 Connector connection - AUTOMATIC STEAM WAND version



AR	Orange
BI	White
BL	Blue
DCP	Pump double check
EV1	GR1 dispensing solenoid valve
EV2	GR2 dispensing solenoid valve
EV3	GR3 dispensing solenoid valve
EV4	GR4 dispensing solenoid valve
EVC	Heating unit filling solenoid valve
EVM	Mixed water solenoid valve
EVT	Tea dispensing solenoid valve
EVV	Steam dispensing solenoid valve
GI	Yellow
GR	Grey
MA	Brown
MP	Motor pump
NE	Black
PA	Air pump
RO	Red
TOR	Toroid
VE	Green
VI	Violet

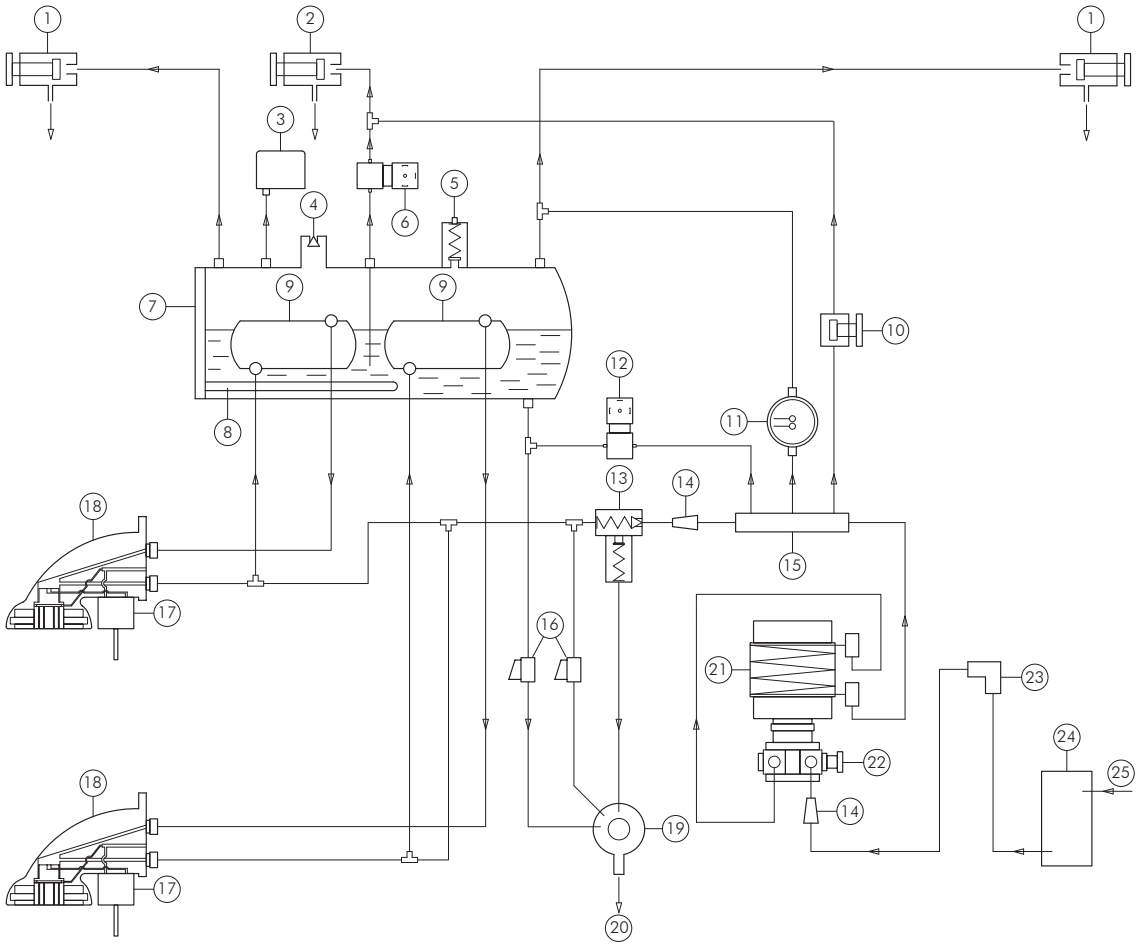
15. HYDRAULIC DIAGRAMS

15.1 LEVER GROUP hydraulic diagram



1	Steam valve
2	Hot water valve
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Pressure gauge
7	Heating unit
8	Heating unit heating element
9	Group lever
10	Automatic Water Entry Solenoid Valve
11	Water inlet filter
12	Water inlet connection
13	Valve
14	Drain tray
15	Drain
16	Water filter/ Softener
17	Water inlet

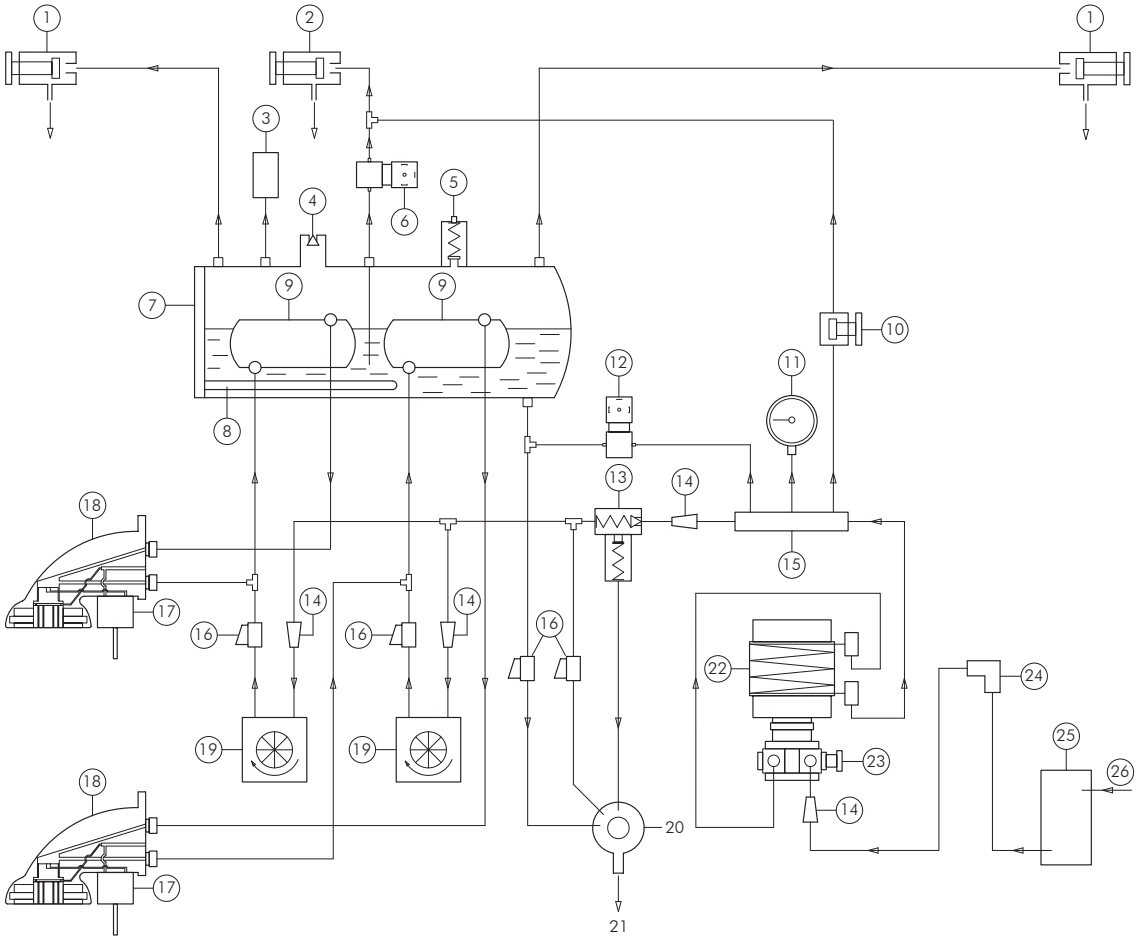
15.2 AEP hydraulic diagram



1	Steam valve
2	Hot water valve
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Hot water solenoid valve
7	Heating unit
8	Heating unit heating element
9	Heat exchanger
10	Mixed water adjustment solenoid valve
11	Pressure gauge
12	Automatic Water Entry Solenoid Valve
13	SCNR valve

14	Water inlet filter
15	Dispenser
16	Valve
17	Group solenoid valve
18	Dispensing group
19	Drain tray
20	Drain
21	Motor pump
22	Pump pressure adjustment
23	Water inlet connection
24	Water filter/ Softener
25	Water inlet

15.3 SAE hydraulic diagram



1	Steam valve
2	Hot water valve
3	Pressure switch
4	Negative pressure valve
5	Safety valve
6	Hot water solenoid valve
7	Heating unit
8	Heating unit heating element
9	Heat exchanger
10	Mixed water adjustment solenoid valve
11	Pressure gauge
12	Automatic Water Entry Solenoid Valve
13	SCNR valve

14	Water inlet filter
15	Dispenser
16	Valve
17	Group solenoid valve
18	Dispensing group
19	Volumetric dosing device
19	Drain tray
20	Drain tray
21	Drain
22	Motor pump
23	Pump pressure adjustment
24	Water inlet connection
25	Water filter/ Softener
26	Water inlet

16. DEBIT-CREDIT SYSTEM

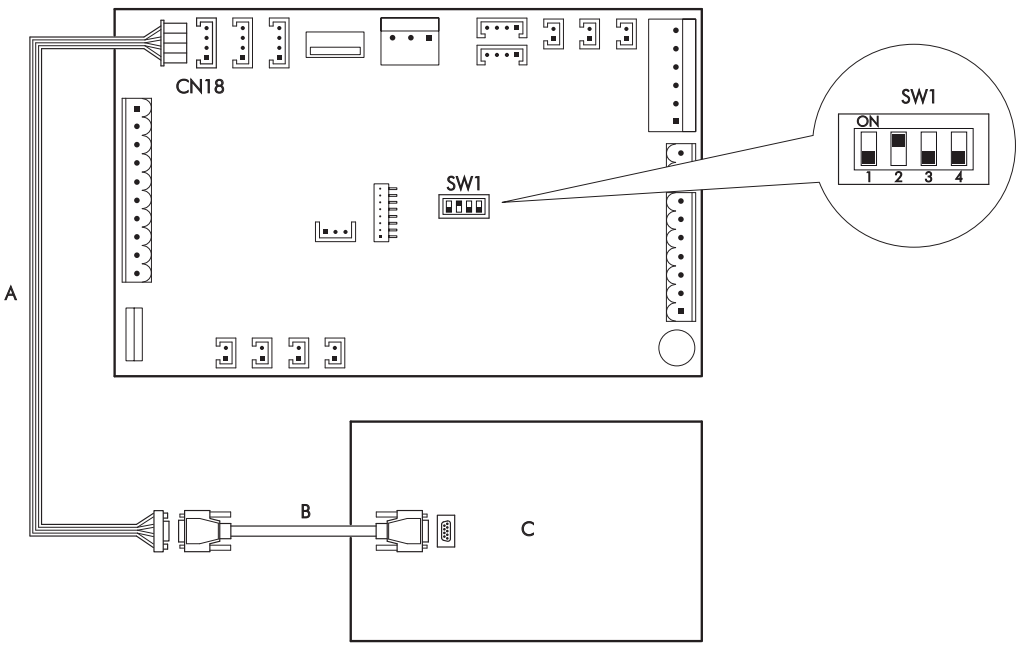
16.1 Direct connection to the till

16.1.1 *Installation*

- Turn the machine off.
- Configure the SW1 jumpers of the machine's electronic control unit as indicated in the wiring diagram.
- Connect the supplied cable (**A**) to the CN18 connector of the machine's electronic control unit.
- Use a standard serial cable (**B**) to connect the cable (**A**) to the till (**C**).
- Turn the machine back on.

A	Serial connection cable supplied, code: 22554012
B	Standard serial cable not supplied (max. 15 metres long) - Code: 22556004
C	Till
CN18	Electronic control unit connector
SW1	Electronic control unit jumpers

The till management software and the standard serial cable (B) are not the responsibility of the manufacturer. Till response timeout: 1 second. Doses can be programmed without having to disconnect the Credit-Debit device.



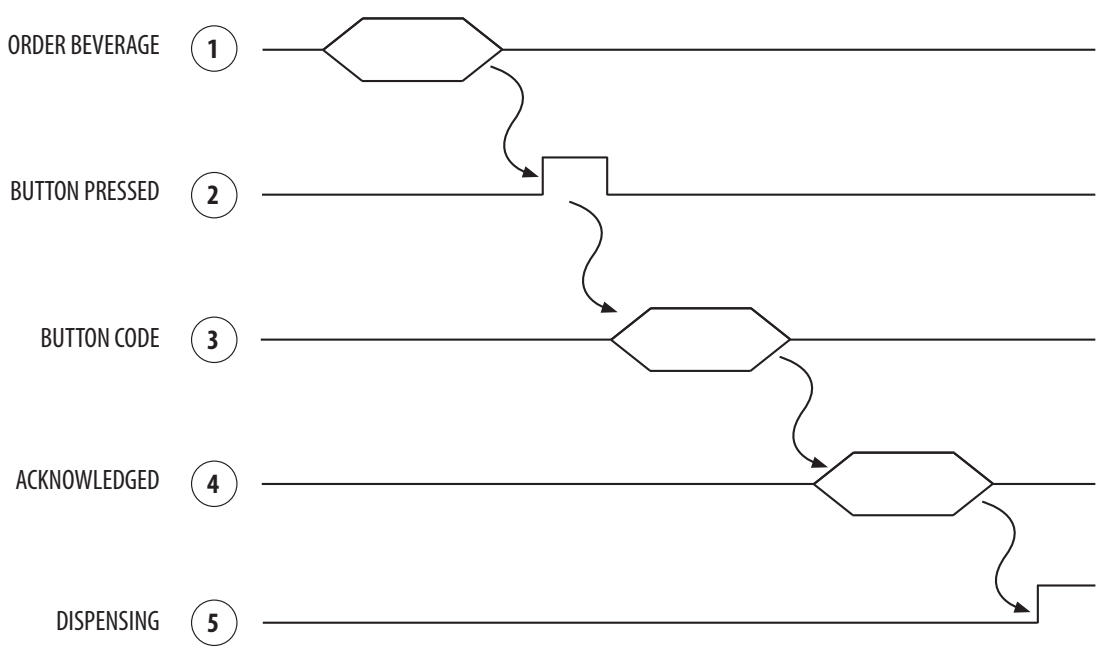
16.1.2 *Communication protocol*

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).



16.1.3 *Beverage selection code table*

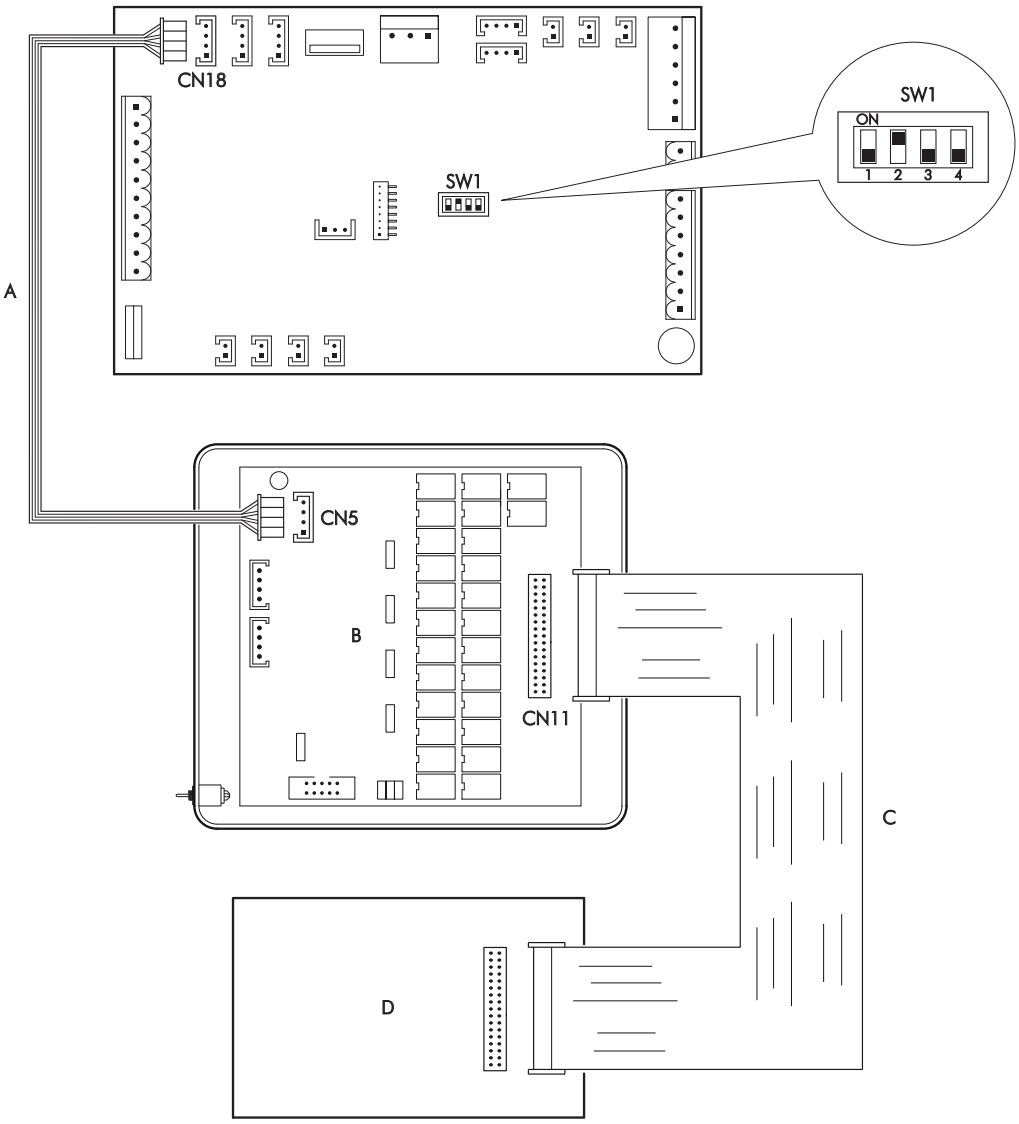
DESCRIPTION	SIGNAL	RELAY	I/O CONNECTOR REF.
1 GR1 Espresso	011 h	1	CN7-1
1 GR1 Medium	012 h	2	CN7-2
1 GR1 Long	013 h	3	CN7-3
2 GR1 Espressos	014 h	4	CN7-4
2 GR1 Medium	015 h	5	CN7-5
2 GR1 Long	016 h	6	CN7-6
1 GR2 Espresso	021 h	7	CN7-7
1 GR2 Medium	022 h	8	CN7-8
1 GR2 Long	023 h	9	CN7-9
2 GR2 Espressos	024 h	10	CN7-10
2 GR2 Medium	025 h	11	CN7-11
2 GR2 Long	026 h	12	CN7-12
1 GR3 Espresso	031 h	13	CN7-13
1 GR3 Medium	032 h	14	CN7-14
1 GR3 Long	033 h	15	CN7-15
2 GR3 Espressos	034 h	16	CN7-16
2 GR3 Medium	035 h	17	CN7-17
2 GR3 Long	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 Long / 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 Long	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

16.2 Till connection via interface (DEBIT-CREDIT system only)

16.2.1 *Installation*

- Turn the machine off.
- Configure the SW1 jumpers of the machine's electronic control unit as indicated in the wiring diagram.
- Connect the supplied cable (**A**) to the CN18 connector of the machine's electronic control unit and the interface (**B**).
- Use a flat ribbon cable (**C**) to connect the interface (**B**) to the till (**D**). By means of a software implementation at the till, the commands from the interface (**B**) must be associated with the selections in the table.
- Turn the machine back on.

A	Serial connection cable supplied, code: 22558
B	I/O Interface - Code: 26011
C	4-pole flat ribbon cable - Code: 22550
D	Till
CN18	RS232 electronic control unit connector
SW1	Electronic control unit dip switch

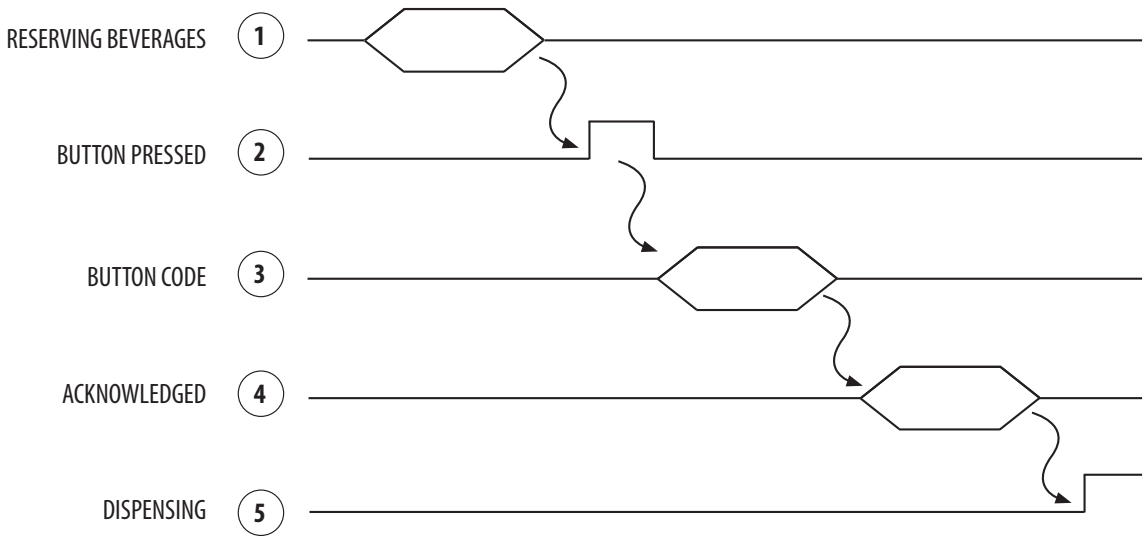


16.2.2 *Communication protocol*

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

- A beverage can be reserved from the till.
- The till sends the reservation-related code to the machine (see the table).
- Start the selection reserved from the machine's keypad (e.g. 1 Espresso, Group 1 = 011 h).
- The machine sends the pressed key-related code to the till.
- If the code from the machine matches the reservation code, the till consents for the order to be dispensed by responding with ACK = 06H.
- If the code does not match, the till will respond with NACK = 0H.

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



16.2.3 *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 Long	013 h	3	CN7-3
2 GR1 Espressos	014 h	4	CN7-4
2 GR1 Medium	015 h	5	CN7-5
2 GR1 Long	016 h	6	CN7-6
1 GR2 Espresso	021 h	7	CN7-7
1 GR2 Medium	022 h	8	CN7-8
1 GR2 Long	023 h	9	CN7-9
2 GR2 Espressos	024 h	10	CN7-10
2 GR2 Medium	025 h	11	CN7-11
2 GR2 Long	026 h	12	CN7-12
1 GR3 Espresso	031 h	13	CN7-13
1 GR3 Medium	032 h	14	CN7-14
1 GR3 Long	033 h	15	CN7-15
2 GR3 Espressos	034 h	16	CN7-16
2 GR3 Medium	035 h	17	CN7-17
2 GR3 Long	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 Long / 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 Long	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

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