



# *Operating Manual*

MODEL. "LINEA" - "FB 70" / VERSION. "EE" - "AV"

## *Chapters*

- |   |         |
|---|---------|
| 1. General warnings and safety specifications         | pag. 3  |
| 2. Definition of available models                     | pag. 4  |
| 3. Installation                                       | pag. 7  |
| 4. Operating the machine and preparing coffee         | pag. 9  |
| 5. Preparing other hot drinks                         | pag. 12 |
| 6. Maintenance and weekly cleaning operations         | pag. 13 |
| 7. De-commissioning and demolition                    | pag. 14 |
| 8. History and use of the La Marzocco coffee machines | pag. 15 |



## 1. General Warnings and Safety Specifications

1) This operating manual is an integral and essential part of the product and must be supplied to users. Users are asked to read the enclosed warnings carefully, as they provide valuable information concerning safety during installation, operation and maintenance.

This manual must be kept in a safe place and be available for consultation to new and experienced users alike.

2) Make sure of the product's integrity by inspecting the packaging, making sure it presents no signs of damage which might have affected the enclosed machine.

3) Check the machine's integrity after having carefully removed the packaging.

### **Notes 2 and 3:**

in case of doubt, do not go on any further and contact your dealer or retailer immediately. They will send out specialized personnel authorized to do work on the machine.

4) Packaging (boxes, plastic bags, foam parts and whatever else) must not be left around within easy reach of children, due to the potential danger it represents, nor be discarded in the environment.

5) Check to see that data on the rating plate correspond to those of the mains electrical supply which the machine will be hooked up to.

The installation must be done according to current regulations and to the manufacturer's instructions, and must be performed by qualified and authorized personnel.

Incorrect installation may be cause for injury/damages to people, animals or objects, for which the manufacturer shall not be held responsible.

Safe electrical operation of this device will be achieved only when the connection to the power outlet has been completed correctly and in observance of current safety regulations, and particularly by grounding the unit very carefully. Make sure grounding has been done correctly as it represents a fundamental safety requirement and, in case of doubt, do not hesitate to have qualified personnel check such connection.

Furthermore, you must ensure that the capacity of the available electrical system is suitable for the maximum power consumption indicated on the rating plate; make sure also that electrical cables are of a suitable size.

We do not recommend using adapters, multiple plugs and/or extension cords. If you cannot avoid using them, make sure that they are exclusively of the kind which conforms to current safety regulations, being careful not to exceed the power and current ratings indicated on such adapters and extension cords.

6) This device must be used exclusively for the functions it has been designed and built for. Any other application is inappropriate and dangerous. The manufacturer shall not be held responsible for any damages caused by improper and irrational use.

7) Using any electrical device requires that certain fundamental rules be observed.

In particular:

- do not touch the device while having wet or humid

hands and feet;

- do not use the device while having no shoes on your feet;

- do not use extension cords in bath or shower rooms;

- do not unplug the device from the power outlet by pulling on the power supply cable;

- do not expose the device to atmospheric agents (rain, sun, etc.);

- do not allow children or untrained people to use this device;

- do not clean the control panel with a wet cloth since it is not watertight.

8) Before carrying out any maintenance and/or cleaning operations, turn the main switch, which is located on the machine, to the "0" position, and disconnect the machine from the electrical network by unplugging the cord or by switching off the relative circuit breaker. For any cleaning operation, follow exclusively the instructions contained in this manual.

9) In case the machine is operating in a faulty manner or breaks down, disconnect it from the electrical network (as described in the preceding point) and close the water supply tap. Do not attempt to repair it, and contact qualified and authorized professionals. Any repairs must be performed exclusively by the manufacturer or by an authorized centre using only original parts. Non compliance with the above forfeits the warranty and could compromise the safe operation of the machine.

10) You should plan to make use of an omnipolar connector during installation, as required by current safety regulations, complete with fuses suitable to bear the power of the machine being connected.

11) In order to avoid dangerous overheating problems, it is recommended that the power supply cable be fully unfurled.

12) Do not obstruct air intake and exhaust grilles and, in particular, do not cover the cup warmer tray with cloths or other items.

13) The machine's power supply cable must not be replaced by users, as also specified on the rating plate located near the outlet of such cable, on the body. In case the cable gets damaged, shut off the machine (as described in point 8) and close off the water supply; to replace it, contact qualified professionals exclusively.

### **CAUTION:**

As already mentioned in the preceding notes, the manufacturer shall not be held responsible for damages to objects, animals and/or people whenever the machine has not been installed according to the instructions contained in this manual, and is not used to do what it was designed for (i.e. preparing coffee and hot drinks).

## 2. Definition of Available Models

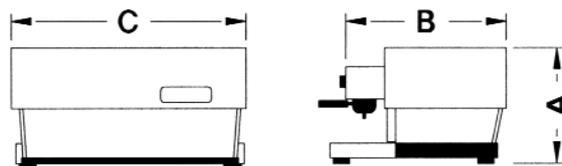
This operating manual refers exclusively to the following models, of our own manufacture:

### Mod. EE - Mod. AV with 1, 2, 3 e 4 groups

Everything set out in this operating manual is also valid for the "FB70" series. The only differences are the external dimension of the machine.

#### COMMON DIMENSIONS AND WEIGHTS FOR THE LINEA SERIES

	1 gr.	2 gr.	3 gr.	4 gr.
A [mm]	420	420	420	420
B [mm]	520	520	520	520
C [mm]	490	690	930	1170
WEIGHT [kg]	44	58	74	92



#### COMMON DIMENSIONS AND WEIGHTS FOR THE FB70 SERIES

	2 gr.	3 gr.	4 gr.
A [mm]	450	450	450
B [mm]	610	610	610
C [mm]	840	1080	1330
WEIGHT [kg]	58	74	92

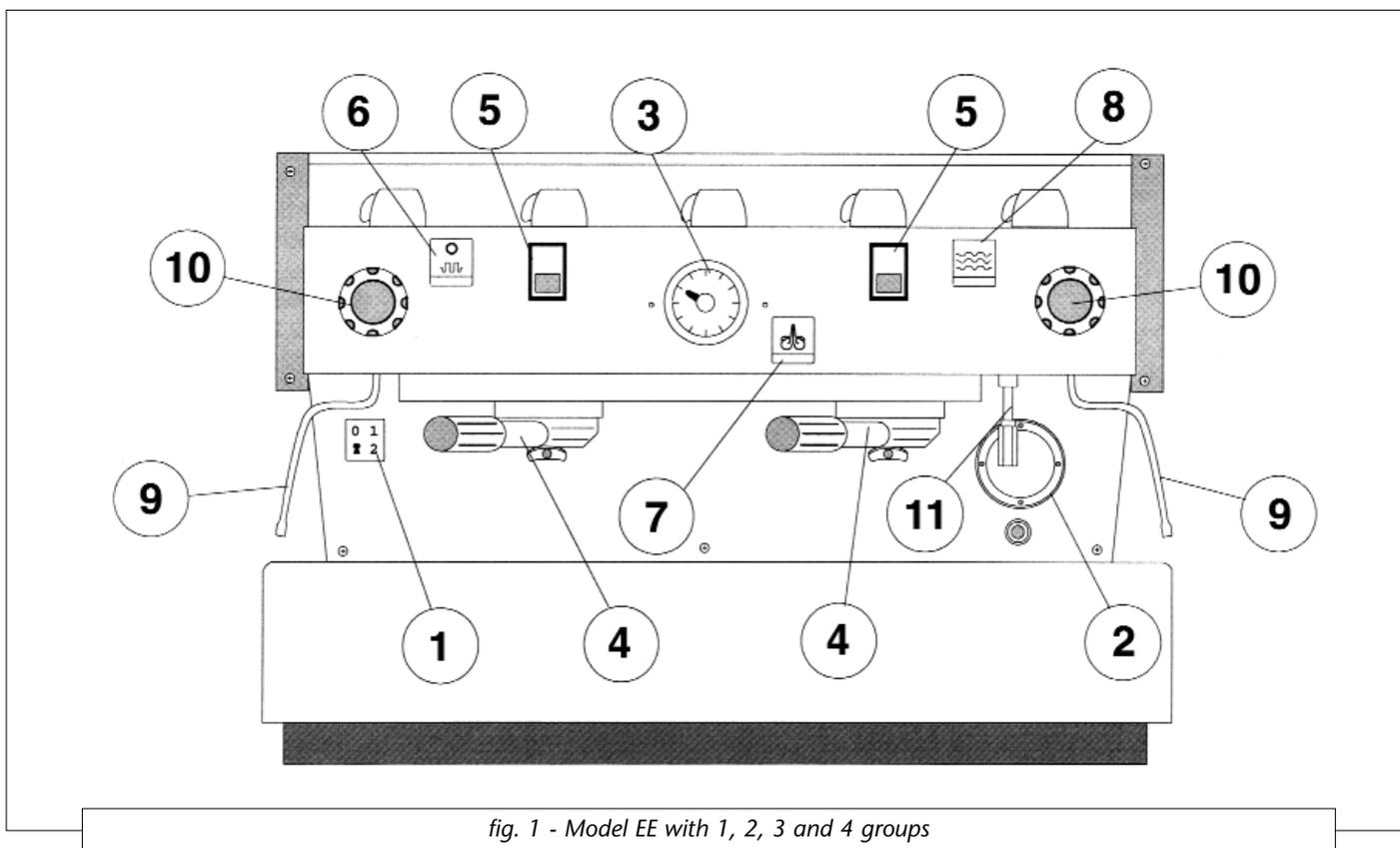


fig. 1 - Model EE with 1, 2, 3 and 4 groups

#### Legend

- |                                 |                                       |
|---------------------------------|---------------------------------------|
| 1) Main switch                  | 7) Hot water switch                   |
| 2) Water level sight glass      | 8) Emergency button for loading water |
| 3) Pressure gauge               | 9) Steam nozzle                       |
| 4) Coffee groups                | 10) Steam knob                        |
| 5) Coffee brewing control panel | 11) Hot water nozzle                  |
| 6) Cup warmer switch            |                                       |

## **General description**

The model EE machine is built in the 1, 2, 3, and 4 group versions and is essentially composed of the following parts:

1. Water boiler (produces steam and hot water);
2. Coffee ("saturation") boiler;
3. Brewing groups;
4. Cover;
5. Motor pump;
6. Water purifier.

### **Description of the various parts**

#### **1. Water Boiler**

It consists of a cylindrical tank, of varying length according to the number of coffee groups, which is made of Aisi 304 stainless steel. Each unit is subjected to a hydraulic test, at a pressure of 3 bar, and has an operating pressure of 1.5 bar. In the following, you will find a list of effective volumes and power ratings according to the number of groups installed:

1 group	3,5 litres	1300 Watts
2 groups	7 litres	2000 Watts
3 groups	11 litres	3000 Watts
4 groups	15 litres	3800 Watts

Covers are installed at either end of the cylindrical tank and on one of them there is a housing for the water heating and vapourizing electrical elements, which allow reaching operating pressure within 25' approximately. Operating pressure is maintained by a manostat. The water boiler has various fittings used for safety devices, for supplying hot water and steam, and for the power supply.

#### **2. Coffee Boiler**

Each unit is subjected to a hydraulic test, at a pressure of 16 bar, and has an operating pressure of 9 bar. In the following, you will find a list of effective volumes and power ratings according to the number of groups installed:

1 group	1.8 litres	1000 Watts
2 groups	3.4 litres	1400 Watts
3 groups	5.0 litres	1600 Watts
4 groups	3.4 + 3.4 litres	1400 + 1400 Watts
	(2 boilers installed)	

It consists of a cylindrical tank, of varying length according to the number of coffee groups, which is made of Aisi 304 stainless steel.

Covers are installed at either end of the cylindrical tank and on one of them there is a housing for the water heating and vapourizing electrical elements, regulated by a precision thermostat with a dT of  $\pm 1^{\circ}\text{C}$  which keeps the water temperature constant. This temperature can be adjusted to reach optimal temperature according to the type of coffee blend being used. The groups are installed on the boiler.

#### **3. Brewing Groups**

They consist of a die-cast block made of nickel-plated brass, on which to install the filter-holder handle used to hold the ground coffee; the espresso flows from the block, through a spout, into the cup(s) after the brewing button has been pressed.

#### **4. Cover**

It consists of a painted and stainless sheet steel body. The structure has been the object of specific studies to provide good aesthetics, to lower ergonomic costs for the operator and to reduce the chance of damage to a minimum.

#### **5. Motor Pump**

The pump, which is of the "positive-displacement" type, is installed on the water supply tubing and is set-up to operate anytime the coffee groups are activated, and through an electric level gauge whenever the water boiler needs to be replenished.

#### **6. Water Purifier**

It is of the "ion exchange" resin type, for water softening purposes. Resins must be regenerated weekly according to the instructions and the diagrams shown on the labels affixed to the purifiers themselves. See Chapter 6.

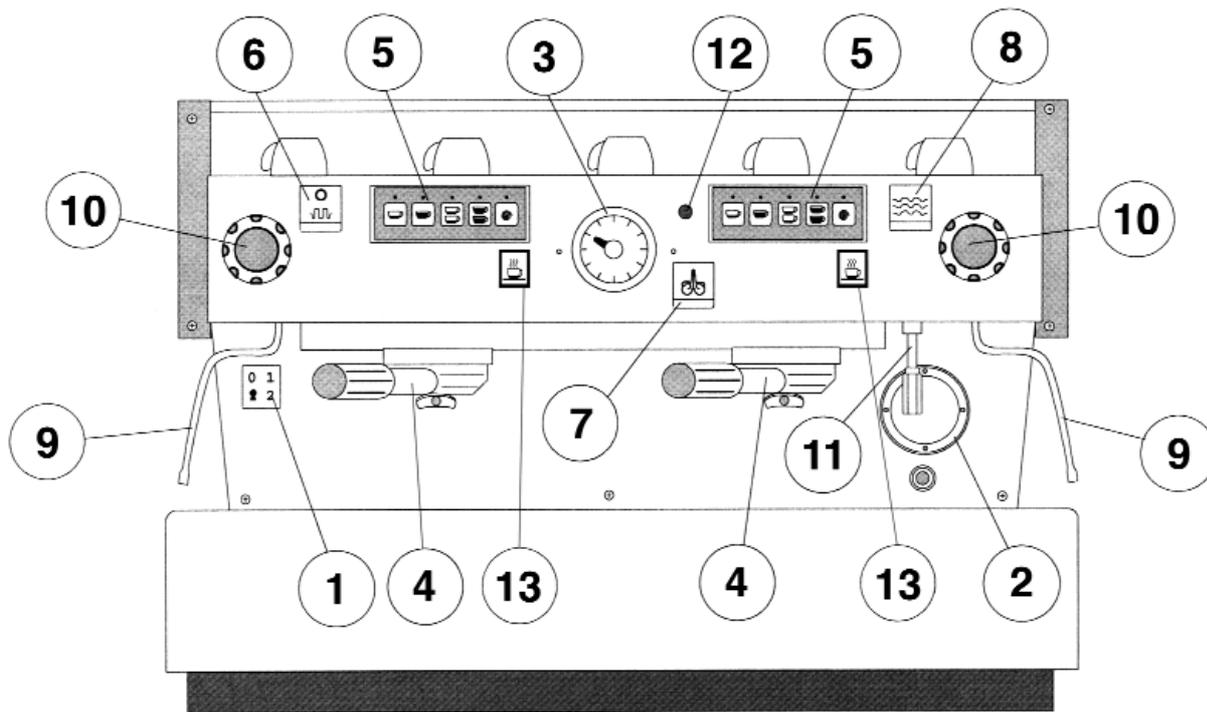


fig. 2 - MODEL AV with 1, 2, 3 and 4 groups

**Legend**

- 1. Main switch
- 2. Water level sight glass
- 3. Pressure gauge
- 4. Coffee groups
- 5. Coffee dispensing control panel
- 6. Cup warmer
- 7. Hot water switch
- 8. Emergency button for loading water
- 9. Steam nozzle
- 10. Steam knob
- 11. Hot water nozzle
- 12. Key operated switch to enable dosage programming  
Not available in Version 3D5
- 13. Manual brew switch

**General Description**

The model AV machine is built in the 1, 2, 3, and 4 group versions and is essentially composed of the same parts as model EE.

This model differs from model EE in that it allows the operator to choose four different quantities of water for brewing coffee. Each group, therefore, is provided with a 5 button control panel, allowing a combination of:

- a quantity of water for one normal (short) coffee;
- a quantity of water for one tall coffee;
- a quantity of water for two normal coffees;
- a quantity of water for two tall coffees.

The fifth button is used to program the other ones, as we shall see later, and as an on-off switch for continuous brewing.



Coffee brewing control panel for the AV model

### 3. Installation

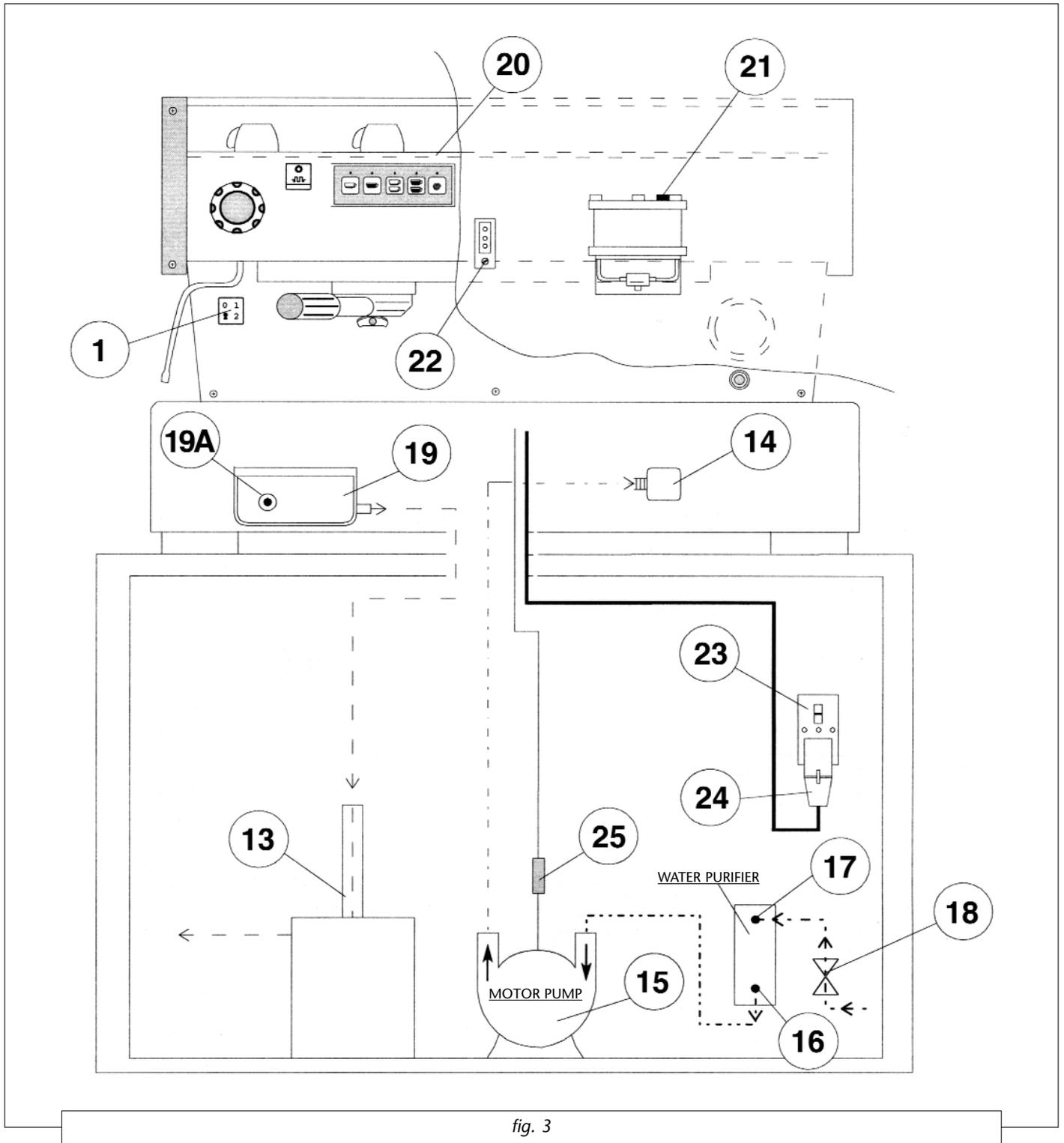


fig. 3

#### Legend

-  380 Volt cable
-  220 Volt cable
-  Water tubing
-  Water supply tubing
-  Drain tubing

## MODELS "EE" and "AV"

### 1, 2, 3 and 4 groups

Check the package to make sure that the following parts are included, further to the machine complete with all its groups:

- a number of 1-dose and 2-dose portafilters corresponding to the number of groups;
- replacement 1-dose and 2-dose filters, one of each;
- 1 tamper;
- 1 blind filter;
- 2 packets of detergent, for the groups;
- 3 flexible metal tubes for water connections;
- 1,5 mt of reinforced plastic tubing for drainage;
- 1 hose clamp.

In order to proceed with installation, it is necessary that the following be available:

1. Pipes carrying drinking water with a 3/8" gas-type end tap;
2. Three-phase, 380V - 50 Hz electrical connection with neutral + ground, near the bench on which the machine is installed and terminating in a suitable protected five-pole socket equipped with an approved interlock switch; or a single phase 220V - 50 Hz electrical connection with ground, protected socket and approved interlock switch (according to which machine has been purchased);
3. Drain tubing.

#### **N.B.**

The drinking water stopcock and the terminal switches for the electrical system will need to be located in the most convenient position for the operator to be able to get to them easily and quickly.

**INSTALLATION** - see fig. 3 (pag.7)

### **CONNECTION TO THE WATER SYSTEM**

Connect the terminal, part 14 of the machine, with a high pressure rubber tube (in order to eliminate vibrations) to the motor pump's water supply fitting (part 15) and then connect the motor pump inlet to the purifier's outlet (part 16) and lastly the water purifier inlet (part 17) to the drinking water tubing by means of the tap (part 18). If, in order to complete the above connections, you need to cut (with a hacksaw), file, or weld the pipes, it is necessary to run some water through the piping before connecting the motor pump and the machine, in order to eliminate any residual particles which could otherwise get stuck in taps or valves thus preventing them from working properly.

**N.B.** The pump is volumetric and has been designed to be used exclusively with cold water. Make sure that

water is always present while the pump is operating, otherwise its reliability may be compromised.

### **ELECTRICAL CONNECTIONS**

Two synthetic rubber cables protrude from the machine:  
1) 5-core cable with 2.5 mm<sup>2</sup> cross section for all 380V versions

or

3-core cable with 2.5 mm<sup>2</sup> or 4 mm<sup>2</sup> or 10 mm<sup>2</sup> cross section for 220V machines, according to the power of the machine;

2) 3-core cable with 1.5 mm<sup>2</sup> cross section for all versions.

The first cable, with larger diameter, is required for connecting to mains power through a five-pole or 220V single phase plug. The second cable is required for the motor pump, running at 220 V and 50 Hz, connected via male-female connectors (part 25).

Before making any connections make sure that the 2 cable grommets are firmly secured to the body of the machine in order to prevent people from inadvertently tugging away the cable.

The first cable must be connected to mains power downstream of a magneto-thermal switch and by means of a protected plug for omnipolar switches equipped with 20A fuses suitable to bear the power of the coffee machine.

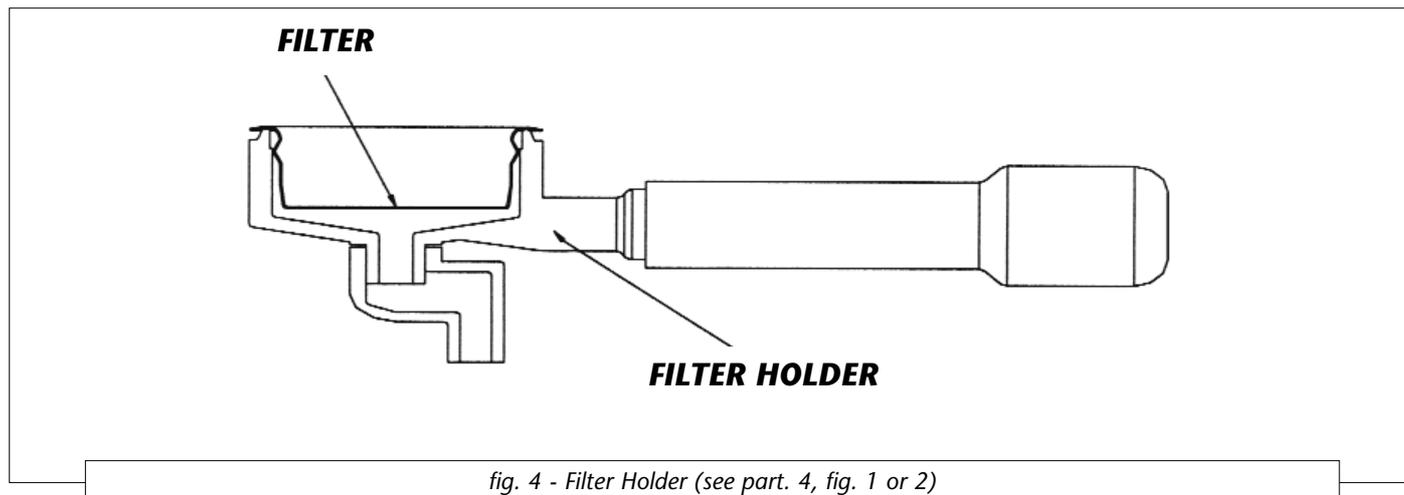
### **DRAIN CONNECTION**

The drain wells of the machine (part 19), are to be connected by means of the special plastic tube to the café's drain piping (part 13). In case such piping is not available, drained liquids may be collected in a suitable bucket and any necessary drain pipe extensions shall be made using steel-lined PVC tubing and suitable hose clamps.

### **WARNING**

*The manufacturer declines any responsibility for any event leading to liability suits whenever GROUNDING has NOT BEEN COMPLETED according to current regulations, or other electrical parts have been connected improperly.*

## 4. Operating the Machine and Preparing Coffee



Once installation has been completed, you can proceed to hook up the filter holders (Fig. 4), together with their filters, to the bottom of the groups by rotating them from left to right; before operating the various switches and thus powering up the heater elements, fill up the boiler tanks with water, as follows:

### 1. COFFEE BOILER

The water flows inside the coffee boiler directly, as soon as the water system and purifier taps are opened. Since the inflowing water will compress the air in the boiler, it will be necessary, in order to completely "saturate" the boiler-groups assembly, to remove the group cover plate (part 20 Fig. 3) and unscrew the small bolt (part 21) a little way so as to allow air to escape until a few drops of water leak out, at which point you should repeat such operation for each group and then tighten the small bolts again and reinstall the cover plate.

### 2) WATER BOILER

By turning the main switch (part 1) to position "1", the automatic level gauge will be switched on which, by activating the solenoid valve and the motor pump (part 15), will fill the water boiler up to a predetermined level selected by adjusting the probe inside the boiler itself.

### N.B.

It may happen that the air inside the boiler builds up pressure (which may be detected through the pressure gauge - part 3, Fig 1 or 2) when the water is allowed to flow in; this "false" pressure must be eliminated by opening the vapourizing tap (part 10, Fig. 1 or 2).

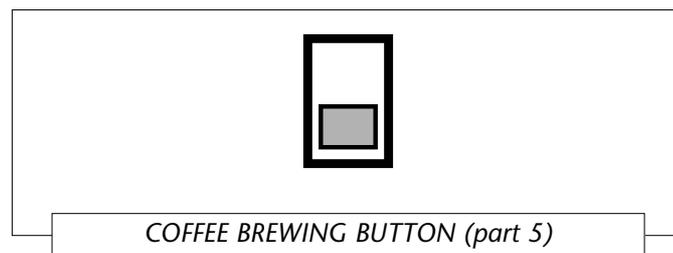
Once you have completed these operations, turn the main switch (part 1) to position "2" and wait for the boilers to reach operating temperature and pressure (which takes from 20 to 35 minutes, depending on the type of machine), which will be subsequently maintained at a constant value automatically.

During this time, it may happen that the pointer of the lower scale on the pressure gauge (part 3, Fig. 1 or 2) reach as high as 14-15 bar; this may occur any time that, while activating the groups, the motor pump forces cold water into the coffee boiler at a pressure of 8-9 bar and, simultaneously, the thermostat regulating the temperature of the boiler itself switches on the heating elements

in order to bring the water contained in such boiler up to operating temperature. However, in this case it is necessary to adjust the 19A expansion valve (Fig. 3) in such a way that the pressure may never exceed 11 bar.

### For model EE - fig. 1

Once you have ensured that the filter holders (Fig. 4) are properly tightened, you should press the brewing buttons (part 5) 2 or 3 times and hold them pressed a few seconds each time, in order to pre-heat the holders. You may then remove the one that you want to make coffee with (1 or 2 cups), together with its own filter, and proceed to place some ground coffee in the filter itself: 1 dose (approximately 6 g) for the small filter, 2 doses (2 coffees) for the larger filter. Press down on the ground coffee with the supplied tamper and hook the filter holder up again to the bottom of the group and then press the switch (part 5) thus allowing coffee to be brewed;



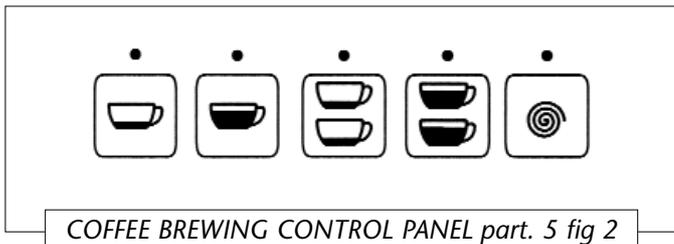
when you have obtained the right amount of coffee, press the switch again (part 5), at which point the machine discharges the pressure built up in the filter holder. The holder may then be removed to proceed with making the next cup of coffee, if so desired.

### CAUTION:

*Do not remove the filter holder when its relative group is brewing hot liquids. Such action may be cause for severe burns.*

### For model AV - fig. 2

It is essential to program the quantity of water delivered by performing the following operations with the utmost care. In case of doubt or difficulties, please contact our technical service.



### Introduction

The coffee metering system is based on the amount of water which will be delivered onto the ground coffee, already set in the filter and the filter holder, which is measured through a water volume control system, which is located above the group assembly flange, which connects the group itself to the boiler. Inside each counter there is a paddle wheel (which we shall call wheel for simplicity) which rotates as water flows by.

The sequence of the water cycle is as follows:

group - counter

counter - solenoid valve

solenoid valve - diffuser

diffuser - coffee brewing spout

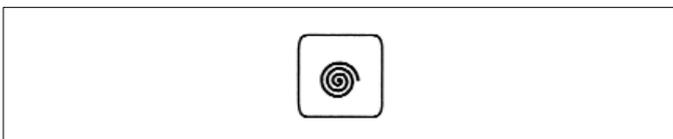
The wheel is designed in such a way as to rotate freely when water is flowing by; it sends 2 signals, every complete rotation, to the electronic module which processes them and activates the solenoid valve relay of the corresponding group, as well as the motor pump relay.

Such electronic module also processes the signal sent by the boiler's level gauge and consequently activates the relative solenoid valve relay of the same motor pump.

### PROCEDURE FOR PROGRAMMING DOSES - fig. 2

1. activate the DAN3 switch (part 12) by using the special key supplied with the standard version;

2. press the 5th button (the one with the spiral symbol, also used for continuous brewing) of the first control panel from the left; at this point, the LEDs of all the buttons will light up which means that they are ready to be programmed;



### Variation in programming for the 3D/5 version

The DAN3 key (part 12) is not required for this version, and in order to program the doses it is sufficient to press the button with the spiral symbol for more than 4 seconds. You can then follow the same operations as for the standard version, which are described in the following.

### N.B.

The LEDs stay on for 5 seconds after which, if no button has been pressed, they turn off; you must then repeat the above-mentioned procedure to turn them on again and to prepare the electronic module for programming;

3. press the first button within 5 seconds and press it again once you have obtained the desired amount of coffee; at this point, the LEDs will turn off and this button will remain programmed as for the dose brewed previously;

4. repeat steps 2, 3 and 4 for the other three buttons; any time a button has been programmed, by pressing the button with the spiral again, the LED of the programmed button(s) will remain switched off.

5. once you have programmed the first 4 buttons of the first control panel from the left, turn the DAN3 switch (part 12) off; the dosage programs set according to the above will be stored in memory and the 5th button (the one with the spiral) will return to its function as a continuous brewing on/off button.

### N.B.

The programs for the first group from the left will become the default programs for the remaining groups, although you may wish to program these groups differently in which case you need to follow steps 1 to 5 for the remaining control panels. The leftmost control panel must be programmed first; indeed, if you were to program this last, all its settings would be automatically transferred to the other groups.

If you decide to change any programs, you will have to wait for a few minutes. In fact, you will not be able to set any new program until the LEDs have turned on again, after having activated the DAN3 switch (part 12) and pressed the 5th button with the spiral symbol.

Each button also works as a switch and, therefore, you may stop coffee brewing at any time, whenever you have obtained the desired quantity, by pressing again the same button you used to start such action.

### Fault warnings

If the wheel does not send any signals to the electronic module for more than 3-4 seconds, the LED of the button which has been pressed will start flashing. This means that:

A) water is not flowing over the wheel and is therefore not reaching the coffee groups, which may be due to:

1. the ground coffee being too fine meaning that the coffee gets brewed too slowly (drop by drop or almost so) and therefore the wheel cannot measure the water flow within the factory-set time of the electronic module.

2. insufficient water flow past the groups (i.e. onto the coffee powder) probably due to a combination of one or more of the following occurrences:

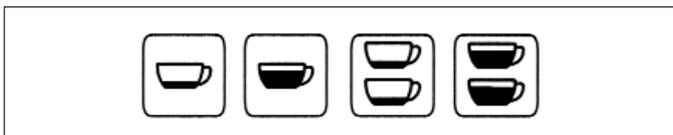
- partial blockage in one of the pipes;
- a malfunctioning motor pump;
- a malfunctioning solenoid valve;
- partial blockage of the filter of the diffuser.

B) there are calcium deposits inside the water flow counter which prevent the wheel from turning properly.

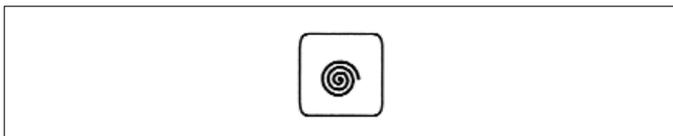
C) the wheel itself and the header (top part) of the counter, which contains said wheel in the bottom part, may be faulty.

### Coffee brewing

Once you have made sure that the filter holders (Fig. 4 and part 4) have been properly tightened, you should press the brewing buttons (part 5) 2 or 3 times and hold them pressed a few seconds each time, in order to pre-heat the holders. You may then remove the one that you want to make coffee with (1 or 2 cups), together with its own filter, and proceed to place some ground coffee in the filter itself: 1 dose (approximately 6 g) for the small filter, 2 doses (2 coffees) for the larger filter. Press down on the ground coffee with the supplied tamper and tighten the filter holder again onto the bottom of the group and then press one of the buttons with the symbols for 1 or 2 cups, strong (short) or long.



You may press the same button again in order to terminate coffee brewing before its programmed stop. If you need an unusual amount of coffee, you may press the button with the spiral symbol and press it again once you have obtained the desired quantity.



Once the coffee has been completely brewed, the pressure in the filter holder is discharged automatically, and the latter may then be removed in order to repeat the operation, as requested.

### **GENERAL NOTIONS FOR PREPARING COFFEE**

When the machine has reached its operating pressure, 1.5 bar which may be checked by looking at the upper scale in the pressure gauge (part 3 Fig. 1 or 2), and its operating temperature at the same time, with the body/group already at infusion temperature, the filter holder and filter must be heated more since they are at the lowest position of the group itself, and they are partially isolated from the same due to the rubber gasket between them. This operation may be carried out by activating the switches (part 5, Fig. 1 or 2) and keeping them in the brewing position for 10-15 seconds, at which point they must be turned off and you must wait for 2-3 more minutes.

During this time, it may happen that the pointer of the lower scale of the pressure gauge (part 3, Fig. 1 or 2) reach as high as 14-15 bar; this may occur any time that, while activating the groups, the motor pump forces cold water into the coffee boiler at a pressure of 8-9 bar and, simultaneously, the thermostat regulating the temperature of the boiler itself switches on the heating elements in order to bring the water contained in such boiler up to operating temperature. However, in this case it is necessary to adjust the 19A expansion valve (Fig. 3) in such a way that the pressure may never exceed 11 bar.

It is important to remember that coffee left over in the filters must be removed only when you need to prepare another cup, and only at that time should you place a

new dose of ground coffee in the filter.

The size of the coffee granules is extremely important in preparing a good cup of coffee, other than the type of coffee mix used, quite obviously. The ideal grinding can be determined by making various coffees using the amount of ground coffee that you would normally use for each cup (we recommend at least 6 g).

The best grinding is that which allows coffee to flow out from the filter holder spouts neither too slowly, drop by drop, nor too quickly.

### **IMPORTANT**

The temperature of the water in the coffee boiler, and therefore of the groups, may eventually be raised or decreased by means of its own thermostat (part 22, Fig.3); by turning the adjusting screw a full 360° clockwise, the temperature will increase by approx. 8°C, and vice versa. The final adjustment should be made during tuning-up, once the machine has been permanently installed, and should not exceed a quarter of a turn (90°) of the screw clockwise or counter-clockwise, which corresponds to a change in temperature of approximately 2°C. The pressure of the water on the coffee during the brewing is very important. For this reason it is important to set the by-pass on the pump at 9 bar. This value changes if there are variations on the incoming pressure from your local water system. If there are variations, make the necessary technical adjustments on the system in order to eliminate them.

## 5. Preparing other hot drinks

### HOT DRINKS

Dip one of the 2 nozzles (part 9, Fig. 1 or 2) which are connected to the steam tap, into the liquid to be heated, turn the knob (part 10, Fig. 1 or 2) gradually until steam comes out at the end of the nozzle (1).

The steam will transfer heat to the liquid raising its temperature up to boiling point.

Be careful not to allow liquid to overflow in order to avoid severe burns.

In order to prepare milk for making cappuccino with the right amount of foam, go through the following steps:

- Place the container half-full of milk under the steam nozzle, open the tap and bring the temperature of the milk almost up to boiling point.

- Lower the container so as to bring the nozzle end to a point just below the surface of the milk; at this point, move the container up and down just enough to dip the nozzle end in and out of the milk until you get the right amount of foam.

You can then pour this milk into a cup containing warm espresso and you will end up with a fresh cup of cappuccino.

### N.B.

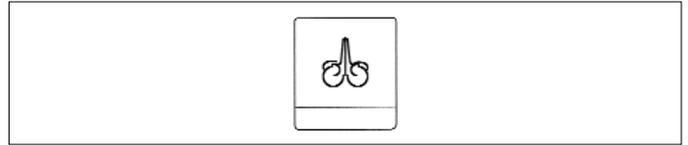
In order to prevent part of the liquid to be heated from being sucked back into the boiler (due to a possible temporary decompression inside the boiler tank) which would cause, after a few days, both the steam and the liquid delivered by nozzle part 9 and nozzle part 11 respectively to smell bad, we recommend that you **de-vapourize** the machine once or twice for just a few seconds, which consists of quickly opening and closing the tap (part 10) **with the nozzle (part 9) not dipped in the liquid** before starting such operation.

Furthermore, once you have immersed the steam wand into the liquid to be steamed in the pitcher, open the steam tap immediately. Once the liquid has been heated, follow this procedure:

- lower the steam pressure
- remove the pitcher
- close the steam tap

### PREPARING TEA - CHAMOMILE AND OTHER DRINKS

You can get hot water by using the fixed nozzle (part 11), located between the group furthest to the right and the steam nozzle (part 9), and pressing the button (part 7, Fig. 1 or 2)



which commands hot water delivery; you can then add the bag containing tea, chamomile, etc. The purified water delivered by the nozzle will usually make the drink darker in colour.

If you wish to have a drink with a lighter colour, just take some cold water from an ordinary water tap and heat it up by using the steam nozzle (part 9) and then add the tea bag or other bag.

## 6. Maintenance and weekly cleaning operations

The machine must not be dipped in, nor splashed with, water in order to clean it. For cleaning operations, please follow the instructions listed below very carefully.

### **Cleaning groups and drain wells**

- Put a tablespoon of detergent powder for coffee machines into the blind filter, supplied with the machine, and tighten it onto the group you want to clean by using a normal filter holder.
- Press the brewing button for said group, as if you were making a regular cup of coffee.
- Stop the water after about 15-20 seconds.
- Start and stop the group several times until you notice clear water coming down, instead of soapy water, when you remove the filter holder.
- Rinse the group using a normal filter, by running hot water through it several times.

### **Caution:**

*Never remove the filter holder when water is being delivered. This operation can be extremely dangerous since the high pressure built-up inside the blind filter would spray out hot and slightly caustic water, which may cause severe burns.*

### **Cleaning filters and filter holders**

- Put 2 or 3 teaspoons of detergent powder for coffee machines in about 1/2 a litre of water inside a heat-resistant container and boil.
- Dip filters and metallic part of portafilters in the boiled solution and leave them fully submerged for about 30 minutes.
- Rinse thoroughly with clean water and run hot water through one group several times with the filters in place.
- Make one cup of coffee in order to remove any unpleasant savour.

### **Cleaning the drain collector**

Remove the drain tray grill every night, pull out the water drain collector and clean it thoroughly. Also inspect and clean the drain well (part 19) at least twice a week, and remove any leftover grounds with a tablespoon.

### **Cleaning the body**

Wipe the stainless steel surfaces with a soft cloth in the direction of the glazing marks, if any. Do not use any alcohol or solvents whatsoever on painted or imprinted parts in order not to damage them.

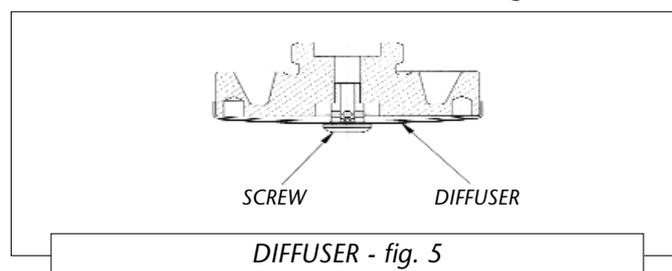
### **Cleaning the hot water and steam nozzles**

Steam nozzles must be cleaned immediately after use with a damp cloth and by producing a short burst of steam so as to prevent the formation of deposits inside the nozzles themselves, which may alter the savour of other drinks to be heated.

### **Cleaning the diffusion screens (infusion filter)**

Due to filter holder discharge operations (subsequent to coffee brewing), a certain amount of coffee grounds may slowly build-up on and obstruct, even partially, the infusion filter. To clean it up, you must first remove it by unscrewing the retainer screw, then proceed to hold said filter with a pair of pliers and burn off the wood particles contained in the coffee grounds by using a gas stove or

the flame from a cotton ball soaked in ethyl alcohol. In the latter case, keep well clear of the alcohol container when lighting the cotton ball and do not add any alcohol at all while the cotton is burning.

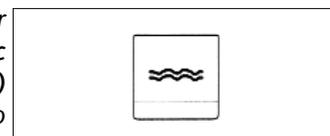


### **Motor Pump**

It is of the positive-displacement type and can develop a pressure of 14 bar. The operating pressure is 8-9 bar and is preset in-factory during testing; however, such pressure may vary from place to place since the pump "absorbs" the pressure in the service water pipes to which it must be connected. You can always check the pressure itself by looking at the lower scale on the pressure gauge (part 3, Fig. 1 or 2) whenever you are brewing coffee, and you can increase such pressure, as required, by turning the by-pass screw (below the plug located on the side to which the pump power supply is connected) clockwise, or reduce it by turning the screw counter-clockwise. Adjust pressure only when at least one group is brewing coffee.

### **IMPORTANT**

*When you activate the motor pump by pressing the specific button (part 8, Fig. 1 or 2) you also give power directly to the coffee boiler.*



*If you activate the motor pump when the machine is cold, a start-up pressure of 8-9 bar will develop; thus, once the heating elements start working and the water temperature increases, the liquid will expand increasing the start-up pressure by about 3 bar, for a total pressure of 11 bar. Once operating pressure is reached, the expansion (safety) valve (part 19A) should start working by discharging a few drops of water, in order to prevent such pressure from exceeding 11 bar.*

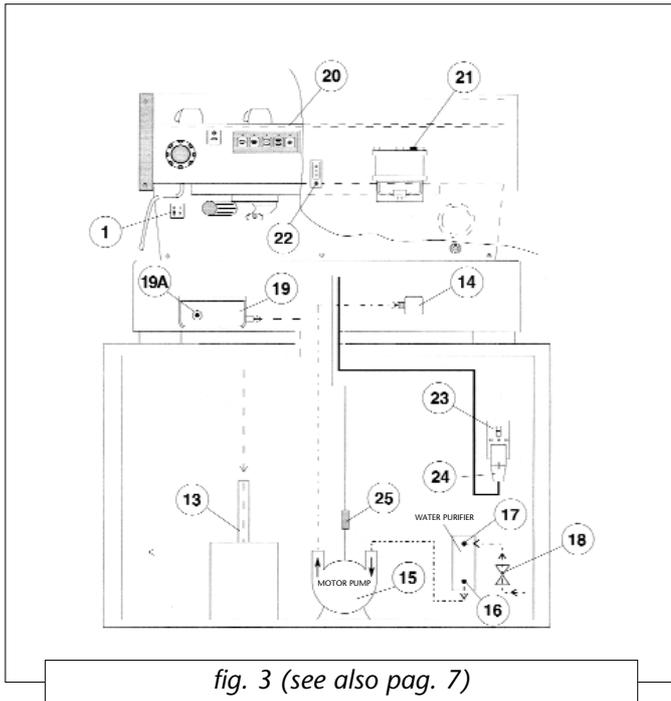
*In case the pressure exceeds 11 bar, you must proceed to adjust the valve by unscrewing the cap slightly. If this is not sufficient, remove the valve and clear away any calcium deposits. This remedy is valid also in case the valve remains open in the drain position (i.e. the pressure cannot increase to 8 bar approx.).*

### **Purifier**

It is of the "ion exchange" resin type. Such resins must be regenerated weekly with ordinary table salt, as indicated on the label affixed to the purifier. An efficient purifier results in the machine working properly.

Using the machine without having adequately regenerated the purifier (at least once a week for supply water having a hardness of between 9 and 13 French degrees) may cause the machine to work improperly. The manufacturer declines any responsibility in this case.

## 7. De-commissioning and demolition



Start by setting the main switch (part 1) to the "0" position.

### *Disconnecting from the power outlet*

In case the machine is connected through the plug (part 24), make sure that the switch (part 23) is also in the Off position before disconnecting. Disconnect the motor pump (part 15) by pulling out its special plug (part 25).

### *Disconnecting from the water system*

Shut off the water supply by closing the specific tap located upstream of the purifier inlet. Disconnect the water pipe at the purifier (part 17) inlet, which is located just downstream of the special tap (part 18), which has been closed in advance.

Proceed to remove the drain well piping (part 19, Fig. 1).

At this point, the machine may be removed from the bar, being very careful not to drop it or squash your fingers.

The machine is made out of various materials and therefore, if you do not intend to put it back in service, it must be taken to a special disposal company which will select the materials which can be recycled and discard the others.

Current regulations make it illegal to discard such machine by leaving it on public grounds or on any private property.

## 8. History and use of the "La Marzocco" Coffee Machines

La Marzocco has been producing espresso coffee machines for use in cafés since 1927.

In February of 1939, when machines being manufactured were exclusively of the vertical boiler type, "La Marzocco" designed and built the first horizontal boiler machines, for which it obtained a "patent".

Second World War brought an end to production of coffee machines, and it prevented the Bambi brothers from maintaining the patent obtained and therefore, at the end of the war, all the coffee machine producers began manufacturing again and they adopted the "horizontal" boiler, which was more practical and suitable for new demands and which is still in use now.

Throughout time, various machines have been designed and built: of the type operating on "Water/Steam" and on the principle of "Hydrocompression", and of the lever operated, air and steam type; semi-automatic and automatic, with mechanical and electrical actuators, up until current production which consists of machines allowing continuous "brewing" operation.

### CHARACTERISTICS PARTICULAR TO THE LA MARZOCCO MACHINES

The great majority of the espresso coffee machines being built today, of almost any brand, are of the "continuous brewing" type, whose basic concept is to use the same water in the tubing, directly to brew coffee by increasing its pressure mechanically and heating it in advance.

In any case, a good cup of coffee is the result of 4 highly interdependent components, to such extent that if only one of them is not quite in perfect harmony with the others, the resulting cup of coffee will turn out not quite as pleasant in taste.

The 4 basic components are:

- 1) coffee bean mix;
- 2) water;
- 3) coffee grinder;
- 4) espresso machine.

#### 1) Coffee Mix

Independently of the various qualities of coffee that make it up, the type of roasting, etc., the freshness of the coffee beans and the way they are preserved is very important.

For coffee beans to be used on espresso machines, it's a good rule of thumb to wait at least 8-10 days after roasting, so that the beans may re-absorb part of the humidity they lost during the roasting process itself, and to use coffee beans within 3-4 days of opening their container.

#### 2) Water

Within the limits imposed by the type supplied locally, water should be free of bad flavours and "softened" using a suitable water softener in order to avoid calcium build-up; in any case, hardness should not exceed 9°F. If water tastes like chlorine it is recommended that you use an active carbon filter.

#### 3) Coffee Grinder

It must allow you to grind coffee beans in a wide variety of granule sizes, in the most uniform manner possible and, once you have established the amount of ground coffee required for each cup, the grinder must guarantee a constant amount from dose to dose. It is best to grind coffee from time to time, trying not to leave any ground coffee in the grinder overnight and during days off.

#### 4) Espresso machine

Among other things, the espresso machine must guarantee the following qualities:

A) the most appropriate water temperature for the type of coffee mix used, constant in time so as to ensure that a good cup of coffee may be prepared any time, whether you have to make several, one after the other, or one from time to time.

B) a constant water pressure through the brewing group and the coffee mix.

As far as the "B quality" is concerned, it is usually obtained by means of the same system in all the "continuous brewing" type machines, that is by using a positive-displacement motor pump, while "quality A" can be obtained with various systems.

The great majority of manufacturers uses systems which are very similar to one another. The underlying principle is to heat up the water used for brewing coffee, which comes directly from the pipes and is pushed by the motor pump, by running it through coils or cartridges (small containers) which are located in the boiler. It follows that the latter must be quite large, which entails a noticeable power consumption, and the temperature may be controlled exclusively through a manostat, a device which is specifically designed for controlling pressure and not temperature; indeed, the temperature changes every time the water/steam ratio in the boiler changes, and even more so when the latter is replenished with cold water.

It is quite obvious that the coils or cartridges which supply water to the brewing groups are very sensitive to the above changes. Furthermore, the heat exchange between the main boiler and the coil varies greatly when, as time goes on, conduction of heat is reduced due to calcium deposits forming on the inside and outside of coils or cartridges. In light of the above, and to avoid wastage of electric energy required to keep large quantities of water at operating temperature/pressure, when only a small part is utilized, our machines have been designed with 2 small boilers, of the size which is most suited to the kind of services they have to offer.

One of them, a "STEAM GENERATOR", is used to deliver steam and hot water for various drinks while the other, a "HOT WATER GENERATOR", is used for the coffee. The latter, therefore, produces hot water used exclusively for brewing coffee, which will flow out, every time the specific group is activated, thanks to the force of the cold water (actually produced by the positive-displacement pump). The temperature of such water is controlled by a THERMOSTAT-like device which is extremely sensitive and has a differential of  $\pm 1^\circ \text{C}$ , adjustable to 1/10 of a

degree in order to adapt it to the optimal temperature, depending on the type of coffee mix being used.

The brewing groups, cast in brass and weighing 3 Kg each approximately, work like thermal "flywheels". They are connected directly to the boiler by means of a large manifold and are thus an integral part of the boiler itself. The manifold is shaped in such a way that each group is located at a greater height than the boiler, so that, just like in the elements of a thermosiphon, a natural circulation of hot water takes place within each group, at the same temperature of the boiler and kept constant by the thermostatic system described previously. The use of these small boilers, completely independent from one another, the special manifold and fastening system of the groups to the boiler as well as the "thermostatic" temperature control, have allowed us to:

- 1) achieve an excellent thermal equilibrium between the brewing groups, both at times of discontinuous operation and during peak times;
- 2) be able to control the temperature of the water running through the brewing groups, independently of the "pressure" and the level in the small steam boiler, and therefore to optimize the water temperature itself in order to obtain the best possible coffee with whatever coffee mixes are available commercially;
- 3) save on electrical energy by more than 30%, in many cases, when compared to other machines.

The "LINEA" series machines are produced in the 1, 2, 3 and 4 group versions, the model "EE" having continuous brewing operation and the "AV" model positive-displacement automatic brewing.

**CONTROL SYSTEMS AND SAFETY DEVICES BUILT INTO "LA MARZOCCO" COFFEE MACHINES**

All models are equipped with:

- automatic level regulator;
- automatic pressure regulator;
- automatic temperature regulator;
- safety devices

- Spring operated safety valve;
- Manual thermostats.

In both models, coffee is brewed by opening a solenoid valve, one for each group. For the "EE" model, the quantity of coffee brewed is regulated manually by the operator through a switch, while in the "AV" model the quantity is regulated automatically in 4 different doses, which may be programmed at will for each brewing group. This last model is equipped with control panels, one located above each group, with 4 buttons which may be programmed in such a way that by pressing the 1st button you get 1 regular coffee, pressing the 2nd one you get one tall coffee, pressing the 3rd you get 2 regular coffees and by pressing the 4th one you get 2 tall coffees. The fifth button, which has a spiral sign, allows continuous brewing operation which can be interrupted by pressing the very same button again.

**CONSTRUCTION DETAILS**

They consist essentially of 2 small boilers, of which:

1. "C.C." hot water generator for brewing coffee.
2. "C.V." steam generator for producing steam and hot water for making tea and other hot drinks.

**1. Description of the Coffee Boiler (C.C.)**

Composed of an ASTM A 312 TP 304 ECS stainless steel tube, with an ext. dia. of 101.6 mm and a thickness of 3 mm. Heating is accomplished through an immersion-type plated heating element.

Operating temperature 95° C, controlled automatically by a thermostatic switch, adjusted to 95° C with a differential of ±1° C.

Operating pressure of 9 bar, developed mechanically by a special positive-displacement pump which is activated automatically every time coffee is brewed.

Pressure is controlled through a pressure gauge with a scale from 0 to 15 bar.

Safety device, based on an expansion type mechanical valve, with counter-acting spring adjusted to 11 bar.

**Testing:**

- a.** hydraulic test at 16 bar performed on the ready-to-use small boilers, at our factory;
- b.** hot water test at 11-12 bar performed on the ready-to-use small boilers, at our factory.

**2. Description of the Hot Water Boiler (C.V.)**

Composed of an ASTM A 312 TP 304 ECS stainless steel tube, with an ext. dia. of 154 mm and a thickness of 2 mm.

Heating is accomplished through an immersion-type plated heating element.

-Operating pressure of 1.5 bar, controlled automatically through a manostat, adjusted so as to open the heating element supply circuit at 1.5 bar and close it at 1.3 bar.

-The pressure is regulated by means of a pressure gauge with a scale of 0 to 2 bar.

-Safety device, based on an expansion type mechanical valve, with counter-acting spring adjusted to 1.7 bar.

**Testing:**

- a.** hydraulic test at 3 bar performed on the ready-to-use small boilers, at our factory;
- b.** hot water test at 1,5 bar performed on the ready-to-use small boilers, at our factory.

**Capacity and Power Ratings**

**1. C.C.**

- 1 group	1,8 litres	1.000 Watt
- 2 groups	3,4 litres	1.400 Watt
- 3 groups	5,0 litres	1.600 Watt
- 4 groups	2x3,4 litres	2x1.400 Watt

**2. C.V.**

- 1 group	3,5 litres	1.300 Watt
- 2 groups	7 litres	2.000 Watt
- 3 groups	11 litres	3.000 Watt
- 4 groups	15 litres	3.800 Watt



## MANDATORY MAINTENANCE AND CHECK-UP OPERATIONS

(These operations are in addition to the Maintenance and Weekly Cleaning Operations as specified in Chapter 6)  
The following maintenance and check-up operations should be carried out periodically by a qualified technician.

DESCRIPTION OF OPERATION	6 months	1 year	2 years
Check pressure safety valve	X		
Replace pressure safety valve		X	
Check pressure gauge	X		
Check thermostatic switch	X		
Check for calcareous build-up	X		
Check electrical system	X		
Replace portafilter gaskets	X		
Replace diffusion screens	X		
Replace filters			X
Check the check-valve	X		
Replace the check-valve			X
Check steam valve	X		
Rebuild steam valve (with steam valve rebuild kit)		X	
Check pressure switch	X		
Check coffee boiler expansion valve	X		
Replace coffee boiler expansion valve		X	

***N.B.: THE PERIODIC MAINTENANCE OPERATIONS SPECIFIED ABOVE ARE NOT COVERED BY WARRANTY***