VERONA

FOREWORD

This manual is for use by qualified personnel and contains information and tips to use and keep your coffee maker as efficiently as possible. Please read all instructions very carefully before you actually use your machine to make sure the machine works properly and to ensure a long working life. Instructions are part of the product. Please keep this document. This booklet refers to the following models:

Model – VERONA SAP

Semi-automatic with continual dispensing through special pushbutton panel with indicator lights and switch for continual manual dispensing. Available in **2 - 3 group versions**.

Model – VERONA SED - SED TCS

Electronic model controlled by microprocessor with dispensing programmable through special pushbutton panel with indicator lights and switch for continual manual dispensing. Available in **2 -3 group versions**.

SPECIFICATIONS
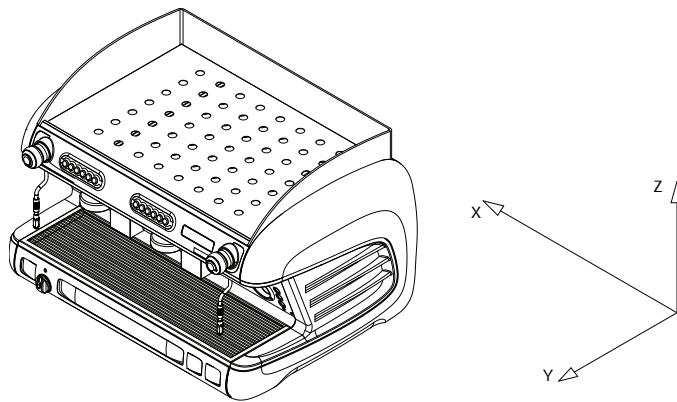
GROUPS		2 BASE	2 TCS	2 BASE TALL	2 TCS TALL	3 BASE	3 TCS	3 BASE TALL	3TCS TALL
Width (X)	mm	820	820	820	820	1050	1050	1050	1050
Depth (Y)	mm	610	610	610	610	610	610	610	610
Height (Z)	mm	590	590	652	652	590	590	652	652
Boiler capacity	litres	12	8,6	12	8,6	19	14	19	14
Small boiler capacity	litres	/	0,28	/	0,28	/	0,28	/	0,33
Net weight	Kg	59	60	63	64	84,5	85,5	92	92
Gross weight	Kg	62	63	66	67	89,5	90,5	99	99
Supply voltage	V	120 220 - 240 380 – 415	120 220 - 240 380 – 415	120 220 - 240 380 – 415	120 220 - 240 380 – 415	120 220 - 240 380 – 415	120 220 - 240 380 – 415	120 220 - 240 380 – 415	120 220 - 240 380 – 415
Power absorbed by the boiler resistance	kW	2,7/4,5	2,7/4,5	2,7/4,5	2,7/4,5	5,1	5,1	5,1	2,7
Power absorbed by the tcs small boiler resistance	kW	/	1	/	1	/	1	/	1
Power absorbed by cup warmer	kW	0,2	0,2	0,2	0,2	0,25	0,25	0,25	0,25
Power absorbed by the electric pump	kW	0,15/0,165	0,15/0,165	0,15/0,165	0,15/0,165	0,15/0,165	0,165	0,15/0,165	0,165
Power absorbed by the solenoid valves	kW	0,15/0,165	0,15/0,165	0,15/0,165	0,15/0,165	0,15/0,165	0,187	0,15/0,165	0,187
Power absorbed by the external electric pump	kW	0,0225	0,0225	0,0225	0,0225	0,0315	0,0315	0,0315	0,0315
Power absorbed by the automatic level regulator	kW	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
Boiler project pressure	(2 Bar) MPa	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Boiler working pressure	(0,8-1 Bar) MPa	0,08:0,1	0,08:0,1	0,08:0,1	0,08:0,1	0,08:0,1	0,08:0,1	0,08:0,1	0,08:0,1
Safety valve calibration pressure	(1,8 Bar) MPa	0,18	0,18	0,18	0,18	0,18	0,18	0,18	0,18
Heat exchanger project pressure	(20 Bar) MPa	2	2	2	2	2	2	2	2
Heat exchanger safety valve calibration pressure	(12 Bar) MPa	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Water mains pressure (max)	(6 Bar) MPa	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6
Coffee distribution pressure	(8-9 Bar) MPa	0,8/0,9	0,8/0,9	0,8/0,9	0,8/0,9	0,8/0,9	0,8/0,9	0,8/0,9	0,8/0,9

The weighted sound pressure level A of the coffee machine is less than 70dB.

For correct appliance operation and trouble-free maintenance, please read this booklet carefully and comply with the instructions and rules, also referring to the diagrams given in it.
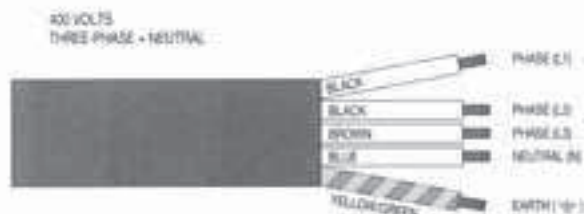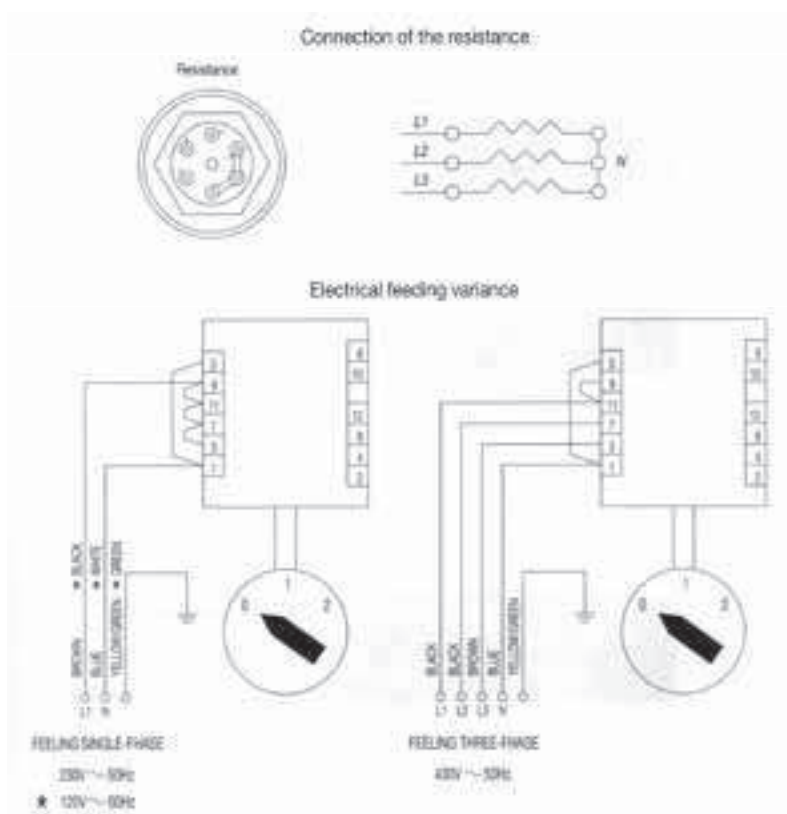
INSTALLATION

Before installing the appliance ensure that the mains voltage and power correspond to the data given in the specifications table. Take the appliance out of the packaging and put it in its final place of installation ensuring that it is stable and safe and that there is the necessary space for using it. Place the machine in a way that the distance between the grid and the floor is wider than 1,5 mt. To clean the internal circuit more efficiently, you are recommended to empty and fill the boiler a number of times and deliver simple water and coffee to be thrown away.

ELECTRICAL CONNECTION

Before connecting the power cable, follow the instructions below to install a safety switch and of the proper capacity:
Install ground cable, then phase cables. Uninstall phase cables first and then ground if needed.
Make sure the ground connection complies with existing standards and regulations.
N.B. CHECK THAT THE DATA ON THE RATING PLATE CORRESPOND TO YOUR MAINS ELECTRICITY SUPPLY.

INSTALLING THE POWER SUPPLY CABLE

Feeding cable installation diagram

WATER CONNECTION

1) Only cold water must be supplied to the appliances.
2) If the mains water pressure exceeds 6 bar, a pressure reducer must be installed to regulate the outlet pressure to a maximum of 6 bar.
3) Connect the drain hose to the tray, avoiding sharp bends and keeping a sufficient slope for regular flow of the drain water.
4) Connect the 3/8" hose to the mains outlet and then to the water softener and to the appliance.

N.B. A water softener is indispensable for correct appliance operation, best coffee in the cup and long life of the components, since it removes scale and residues from the water that would otherwise shorten their life.

The company is relieved of all and any liability in the event of failure to comply with the above instructions.

Open the tap and let water flow through the deconcentrator to clear dirt off the circuit before plugging the hose into the pump.

USE
## Preliminary check

Before using the appliance, check that:
- the plug is inserted properly into the mains power outlet;
- the filling hose is correctly connected to the mains outlet and that the water supply is open. Also check for leaks;
- the drain hose is positioned according to the above instructions and fixed by a hose clamp.

With the steam tap (B) open, put the on/off switch (D) to position 1 and wait for the water in the boiler to reach the maximum level set by the electronic control, which can be visually checked on the level indicator (L). If the boiler does not fill within the set time-out (90 sec.), the pump stops and the indicator lights on the control panel start to blink. If this happens, put the on/off switch (D) to position 0 and then to position 1 per to complete filling of the boiler.

Than put the on/off switch (D) to position 2, which switches on the electric heating elements to start heating the water.

Wait for steam to come out the steam nozzle (B), then close the tap and, using the Boiler pressure gauge, check that the pressure has reached and maintains a value of 0.8:1 bar. If not, use a screwdriver to turn the pressure switch adjustment screw towards + or - as shown below SAP version.

In the SED version, see programming of the 3DS MAESTRO DE LUX control unit.
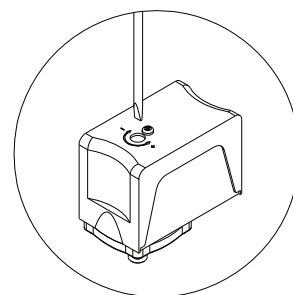
N.B. Manual filling

Even if the control unit fails to operate, the appliance boiler (A) may be filled manually.

With the visual help of the level indicator (L), keep the manual filling knob (A) pressed until the water fills the boiler, taking care not to exceed the maximum indicator level (L); then release the knob. In this circumstance, use the manual switch (R) to dispense coffee.

Hot water

Check through the water level indicator (L) that there is sufficient water in the boiler before dispensing hot water or steam.

Ensure that the boiler pressure gauge indicates a pressure of 0.5:1 bar.

Press the button (M6) to dispense hot water and press again to stop.

Pay the utmost attention in order to prevent scald burns.

Steam

Except for the 1-group machine that has just one steam nozzle, all the other models have 2 located at the sides. These steam nozzles are recessed but can swivel out thanks to an articulated joint. To dispense steam, just turn the knobs (B) counter-clockwise.

Pay the utmost attention in order to prevent scald burns.

Coffee with Mod. VERONA SAP

Insert the filter holder (E) into the group head (F) turning the filter holder counter-clockwise. Press the button (I) and wait for the required quantity of coffee to be dispensed, then put it back to its original position.

Coffee with Mod. VERONA SED - TCS SED

Insert the filter holder (E) into the group head (F) turning the filter holder counter-clockwise. Using the keypad (M) select the caption corresponding to the required type of coffee:

M1=One strong/normal coffee.
M2=One normal/weak coffee.
M3=Two strong/normal coffees.
M4=Two normal/weak coffees.
M5=Key for electronic programming or continual manual dispensing.

Before using the appliance the operator must check that the water level in the boiler is above the minimum level by looking at the indicator (L).

DISPENSER PROGRAMMING

a) To access this phase keep the button M5 on the first pushbutton panel on the left pressed for over 5 seconds. The indicator lights of the buttons M5 start to blink continuously. Select the caption corresponding to the amount required and press to dispense. The indicator light of button M5 and that of the selected caption remain lit. When the required amount has been dispensed, press the selected dispensing button again so that the control unit stores the data. Repeat the above procedure for all 4 dispensing buttons on the pushbutton panel. A dispensed quantity

may also be set for the hot water button (M6) by repeating the above procedure. Upon completion of the procedure, the remaining groups will automatically use the stored quantity. The other groups may, however, be programmed independently by repeating the same procedure as above after having programmed the first group on the left.

b) There are 2 safety systems inside the control unit designed to protect the electronic system and the various parts of the appliance. If, upon pressing a dispensing button, the corresponding indicator light starts blinking, this indicates a malfunction in the electronic system or lack of water. For safety reasons, the dispensing of water stops after 4 minutes and in any case after 4 litres of water.

c) The VERONA electronics also offers the possibility of reproducing the pre-brewing effect by wetting the coffee for 0.6 seconds and then stopping the subsequent brewing from starting for 1.2 seconds. This optional is only applicable for single shots of coffee.

CLEANING

Filter: after having dispensed the last cup of coffee, the filter and filter holder must be washed with water. If they are damaged, worn or clogged, they should be replaced.

Drip tray and grid: the drip tray and grid should be removed frequently and coffee residues cleaned away. Use hot water to clean the coffee ground discharge tray to avoid coffee ground fermentation and related smell.

Water softener: the softener should be periodically regenerated according to the manufacturer's directions given in the instruction booklet.

External housing: the external housing and the steel parts should be cleaned with sponges and soft cloths to avoid scratching. Only use detergents that do not contain abrasive powders or solvents and do not use steel wool.

WARNINGS: when using the appliance it is recommended that the various instruments be kept under control, checking that they are in the previously indicated normal working conditions.

When the appliance has been left unused for a number of days, or every 2/3 months during normal use, to clean the internal circuits more efficiently, it is good practice to fill the boiler a number of times and deliver simple water and coffee to be thrown away.

APPLIANCE FAILURE

the user must check that this is not due to:
- power failure or blackout
- lack of mains water supply or no water inside the boiler.

For any other causes, contact a qualified SANREMO After-Sales Service Centre.
BEFORE CARRYING OUT ANY WORK INSIDE THE APPLIANCE OR REMOVING ANY PART OF THE HOUSING, ALWAYS DISCONNECT FROM THE ELECTRICITY SUPPLY.

WARRANTY

Every purchased appliance (keep the receipt, invoice and delivery note) is covered by a statutory guarantee. This warranty envisages the replacement free of charge of parts that are shown to the service centre or manufacturer's satisfaction to be defective due to faulty materials or workmanship and providing that the appliance has not been misused or tampered with by unauthorised persons or persons using incorrect components or techniques.
Any defective part shall be returned to the manufacturer.
NOTE: never activate the pump without water. Excessive heat will damage the pump and **no warranty replacement is granted in that case.**

WARNINGS

The appliance must not be cleaned using a water jet.
Do not put the appliance in water.
The appliance must not be positioned near to any source of heat.
The appliance is unsuitable for outdoor installation.
To ensure safe use the appliance must be in a level position.
If the power cable is damaged, have it replaced by a SANREMO After-Sales Service Centre, since a special tool is required for this purpose.
The appliance must be used in rooms with a temperature between 5°C and 35°C.
IN THE EVENT OF FAILURE OR MALFUNCTION, REQUEST SERVICE ONLY FROM QUALIFIED PERSONNEL AT THE AFTER-SALES SERVICE CENTRE.
The data and features indicated in this booklet are not binding on the manufacturer, which reserves the right to make changes to its models at any time.
The manufacturer shall not be under any liability for injury to persons or damage to property arising from failure to comply with the instructions given in this booklet.

INFORMATION FOR USERS

In accordance with article 13 of legislative decree no. 151 "Implementation of directives 2002/95/EC, 2002/96/EC and 2003/108/EC on restriction of the use of certain hazardous substances in electrical and electronic equipment and the disposal of waste".
The appliance or packaging is marked with the symbol of a bin with a cross to indicate that at the end of its working life it must be disposed of separately from other waste.
Separate collection of this appliance at the end of its working life is organised and managed by the manufacturer.
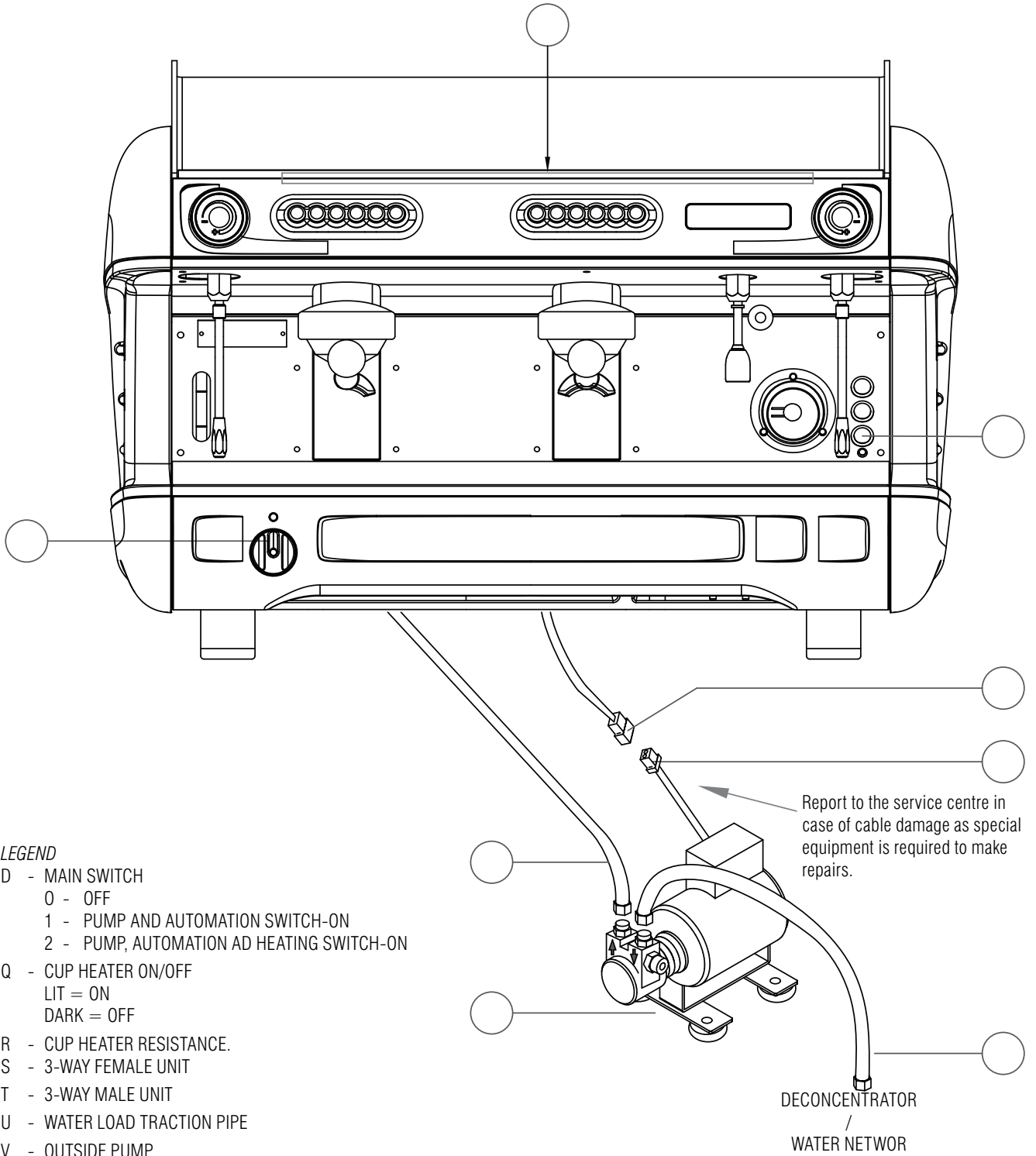The user wanting to dispose of this appliance should therefore contact the manufacturer and follow the separate waste collection system to dispose of the appliance at the end of its working life.
Appropriate separate collection and the subsequent recycling, treatment and ecological disposal of the disused appliance help avoid possible negative effects on the environment and health and encourage the re-use and/or recycling of the constituent materials.
The unlawful disposal of the product by the user is punishable by the administrative sanctions provided for by the legislation in force at the time.

Instructions and connection of cup warmer and external pump

LEGEND

D - MAIN SWITCH
    0 - OFF
    1 - PUMP AND AUTOMATION SWITCH-ON
    2 - PUMP, AUTOMATION AD HEATING SWITCH-ON

Q - CUP HEATER ON/OFF
    LIT = ON
    DARK = OFF

R - CUP HEATER RESISTANCE.

S - 3-WAY FEMALE UNIT

T - 3-WAY MALE UNIT

U - WATER LOAD TRACTION PIPE

V - OUTSIDE PUMP

Report to the service centre in case of cable damage as special equipment is required to make repairs.

DECONCENTRATOR
/
WATER NETWOR

Place outside pump firmly on its feet.

Do not place the pump in the vicinity of heat or water.

Warning – correct use of rotary pumps

1-Proper Alignment of Pump and Motor
On occasion the noise of a motor-pump assembly is caused by a poor alignment.
When the coupling between motor and pump is rigid, the pump rotor and the motor rotor may be out of axis. If this condition is maintained over time the most likely damage is seizure of the pump.
An efficient solution of this problem is the use of an elastic coupling between pump and motor. Fluid-o Tech supplies an optional kit code N. 10051020.

Cod. 10051020
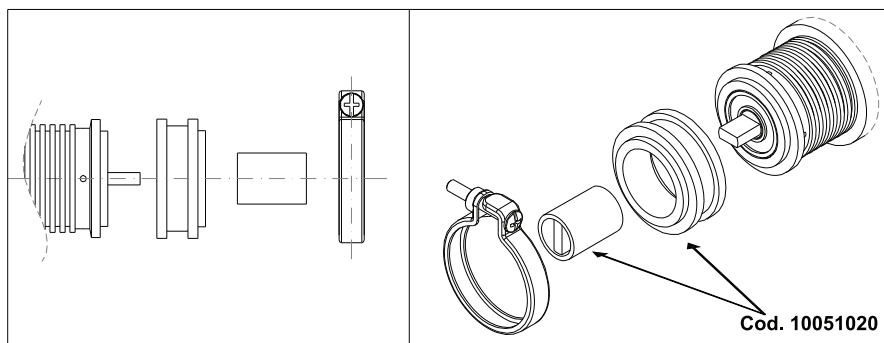
2-Quality of Water.
Tight mechanical tolerances of components and materials used for rotary vane pumps require a very clean water, free from suspended particles.
Sand, deposits on connecting pipes or the resins of the sweetener, when flowing through the pump, may scratch graphite parts causing problems of insufficient pressure and flow rate.
If a closed loop hydraulic circuit is not available to guarantee a clean water and no sources of contamination Fluid-o-Tech recommend to install a 5-10 micron filter between the sweetener and the pump.
Recommended filter: food approved polipropilene wire cartridge.
Keep the filter clean.: an upstream dirty filter will create cavitation and the pump will break shortly (see section 4).

3-Dry operation
Rotary vane pumps may operate in dry condition only for a very short time- few seconds!
Without a proper water cooling the temperature of the mechanical seal will increase very quickly with resulting breakage. The most likely impact is a remarkable leak visible from the four drain holes close to the motor clamp . For potential lack of feed from city water line Fluid-o-Tech recommend the installation of a minimum pressure safety switch upstream from the pump.
In case of feed from a tank install on the tank a minimum level switch.

4-Cavitation
Cavitation shows when feed flow rate does not match the pump design requirement: most frequent causes are dirty filters, small diameter pipes, more users on the same line.
Opening of the safety valve (generally installed upstream from pump and filter) must happen
before the pump start up. This will avoid cavitation. For the same reason closing of the safety valve must be delayed after the pump shut down.
The most noticeable effect is an increase of noise. If cavitation continues the impact is the same as of dry operation.

5-Back Feed of Hot Water
If a non return valve between the pump and the hot water vessel is defective the pump may come in contact with hot water(90-100°C). Dimensional variations of components will cause seizure of the pump.

6) Wrong connections
Pumps connectors are 3/8"NPT(conical) or 3/8" GAS(cylindrical).
Connectors with thread different from the recommended type are occasionally used. Sealing is made with a glue or with teflon tape. If the connector is forced it is possible to create beards; if excess sealing glue is used the extra quantity of glue may enter into the pump body.
In both cases it is likely to create a damage.

7) Pressure strokes
To avoid pressure strokes opening of solenoid valves installed downstream must happen before the start of the pump. For the same reason closing of the valve must be delayed after stopping of the pump.
A pressure stroke may break graphite parts and damage mechanical seal causing blockage of the pump and leaks.

8) Handling
A crash on the floor may create deformations that will jeopardize the tight mechanical tolerances of the pump components. For the same reason be very careful when clamping the pump to mount or demount connectors.

9) Scale build up
Scale deposits will quickly show on inner components when using hard water, not sweetened with ion exchange resins.
Scale formation increases when the pressure relief valve is used as flow rate regulator: the rate of scale deposition increases with increasing of closed loop circulation.

Scale deposits cause an increase of torque, occasional seizure of the pump or a reduction of operating pressure because the pressure relief valve cannot work properly.
To minimize this problem Fluid-o-Tech suggest to use pumps with flow rate matching the hydraulic circuit features.
In some circuits it is advisable to periodically remove scale with a chemical treatment.

PROGRAMMING OF THE 3DS MAESTRO DE LUX CONTROL UNIT

USER INTERFACE

BUTTONS

K1GR1, K1GR2, K1GR3:	Button supplying 1st dose of coffee	Group 1, 2, 3
K2GR1, K2GR2, K2GR3:	Button supplying 2nd dose of coffee	Group 1, 2, 3
K3GR1, K3GR2, K3GR3:	Button supplying 3nd dose of coffee	Group 1, 2, 3
K4GR1, K4GR2, K4GR3:	Button supplying 4nd dose of coffee	Group 1, 2, 3
K5GR1, K5GR2, K5GR3:	Continuous / programming button	Group 1, 2, 3
K6GR1, K6GR2, K6GR3:	Button supplying dose of tea/steam	Group 1, 2, 3

Note: as will be better specified in the respective paragraph, some buttons belonging to the keyboard of group 1 perform specific functions (other than supplying) when programming is being carried out:

BUTTON	ADDITIONAL FUNCTION	FUNCTION DESCRIPTION
K1GR1	+ (PLUS)	Function of "increasing" the numerical values or selecting the "predetermined" options related to the parameter to be programmed
K2GR1	- (MINUS)	Function of "decreasing" the numerical values or selecting the "predetermined" options related to the parameter to be programmed
K3GR1	ENTER	Function of confirming some operations during programming
K5GR1	MENU	Function of selecting / choosing the parameter that is to be programmed

LED

L1GR1, L1GR2, L1GR3:	Led for 1st dose of coffee	Group 1, 2, 3
L2GR1, L2GR2, L2GR3:	Led for 2nd dose of coffee	Group 1, 2, 3
L3GR1, L3GR2, L3GR3:	Led for 3nd dose of coffee	Group 1, 2, 3
L4GR1, L4GR2, L4GR3:	Led for 4nd dose of coffee	Group 1, 2, 3
L5GR1, L5GR2, L5GR3:	Continuous / programming led	Group 1, 2, 3
L6GR1, L6GR2, L6GR3:	Led for dose of tea/steam	Group 1, 2, 3

DISPLAY

LCD: Display LCD 16 characters x 2 lines

CONNECTION

The connection with the external keyboard(s) is made by means of a 16-way flat band cable (8x2ways), the length of which will depend on the position of the keyboards.

EXAMPLE OF BUTTON LAYOUT

NOTE: the graphics used in this document to represent the keyboards is purely indicative, supplied purely as an example.
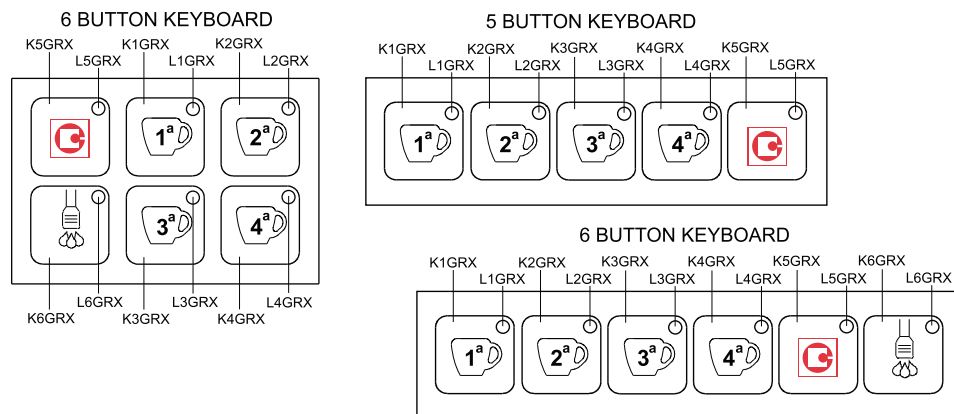
INPUTS / OUTPUTS

INPUTS / OUTPUTS

CV1:	group 1 flow meter input	**CV2:**	group 2 flow meter input	**CV3:**	group 3 flow meter input

LOW VOLTAGE ANALOG INPUTS
STCAF: boiler temperature probe input
STLVAP: steam spout temperature probe input
SLIV: boiler level probe input
SLIVMIN: boiler minimum level probe input

LOW VOLTAGE OUTPUTS (low voltage)
RISCAF: low voltage output for triac or boiler heating element static relay (PID)

RS232 SERIAL LINE (low voltage)
TxD/RxD: signals for RS232 serial transmission (TTL)

MICROPROCESSOR PROGRAMMING LINE (low voltage)
FLASH: signals for "on-board" programming of the Flash processor (for Gicar use)

HIGH VOLTAGE OUTPUTS (8 RELAYS)
PUMP: Pump relay output
EV1: group 1 supply solenoid valve relay output
EV2: group 2 supply solenoid valve relay output
EV3: group 3 supply solenoid valve relay output
EVLIV: filling solenoid valve relay output
EVTEA: tea solenoid valve relay output
ON/OFF: general contactor (on/off) relay output or output for heating remote control switch (not PID)
EVVAP: steam solenoid valve relay output

POWER SUPPLY (high voltage)
The doser is supplied with the rated mains voltage through the connector provided.

CONNECTIONS
see "Electrical Characteristics".

SWITCHING ON THE DOSER

When the doser is fed by means of the external main switch, it resumes the "OFF" or "IDLE-ON" status that it presented before being disconnected from the mains (see "Procedures in the event of a power cut").

At the time of switching on the doser, the display briefly shows the version of the software installed (x.yy).

the display shows:

```
3D5 DE LUXE
   REV.X.YY
```

OFF STATUS (DOSER OFF BUT SUPPLIED)
With doser switched off:
- all the outputs are deactivated
- all the functions are disabled, except those of Programming the TECHNICAL LEVEL

the display shows:

```
OFF          hh:mm
```
where hh:mm INDICATE the present hour and minutes

IDLE ON STATUS (ON)

SWITCHING ON
To switch on the doser, press the button K3GR1.
In idle-on status, the doser detects the status of the level and minimum level probes (the latter only if used); if the probe detects lack of water in the boiler, the order is given to fill the boiler by activating the filling solenoid valve **EVLIV** and the **PUMP** until the correct water level is restored (Filling time-out - see ALARMS paragraph).
When filling is completed, heating is activated (see paragraph "boiler heating").

If correct levels are found, or after the levels have been topped up, the doser enables or programmes the selections of coffee doses (see following paragraphs).

Enabling distribution is not subordinate to reaching set-point temperature in the boiler.
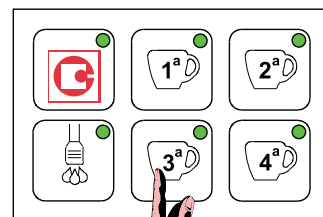
IN IDLE-ON STATUS ALL THE LEDS ARE LIT

the display shows:

```
xxx°C        hh:mm
      SANREMO
```
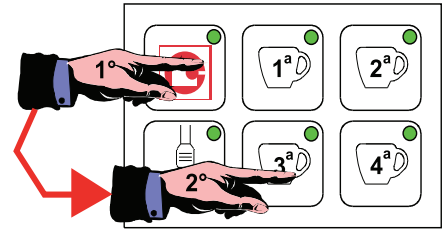
where

hh = present hour (0 ÷ 23)
mm = present minute
GICAR srl = customer name desired

SWITCHING OFF

To switch off the doser, hold down first the key **K5GR1** and then immediately the key **K3GR1**.

DISTRIBUTION

COFFEE CYCLE

DISTRIBUTION

From idle-on state, the six LEDs L1-L6 in the three groups are in the ON state. Pressing one of the four dose buttons belonging to the group from which you want to distribute the dose (for example K1GRx) , both the distributing solenoid valve EVx and the PUMP will be energised, launching the distributing phase. The pump and the solenoid valve will remain activated until the previously programmed quantity of product (flow meter impulses) is reached. The LED corresponding to the button of the chosen dose remains lit throughout coffee distribution, while the others are in the OFF state.

START DISTRIBUTION

the display shows:

```
Brewing      Gr:x
     Espresso
```
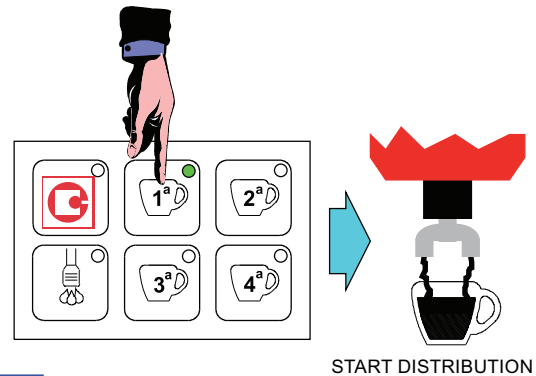
During distribution the display indicates the dose given (English version)
1 Espresso
2 Espresos
1 Coffee
2 Coffees
Continuos
Tea
Steam

NOTE: If keypad 6T/12L is used, as well as normal management of the LED corresponding to the dose requested (see above), the 6 LEDs on the keypad (L7GRX - L12GRX) will switch on sequentially to indicate the duration of the dose being distributed. From the moment the request for distribution is given and the distribution solenoid valve EVx and PUMP are energised, LEDs L7GRX, L8GRX, L9GRX, L10GRX, L11GRX and L12GRX will switch on in sequence. At the same time as L12GRX comes on, the dose is distributed, the system de-energises the solenoid valve EVx and the PUMP and the LED corresponding to the dose concerned goes off. At the end of distribution of a dose, LEDs L7GRX - L12GRX will remain ON (unless there is a further request for distribution in the meantime) for about 10", after which they will all switch OFF.

6 KEY / 12 LED KEYPAD

L7   L12

sequential switching on of L7 to L12

START DISTRIBUTION
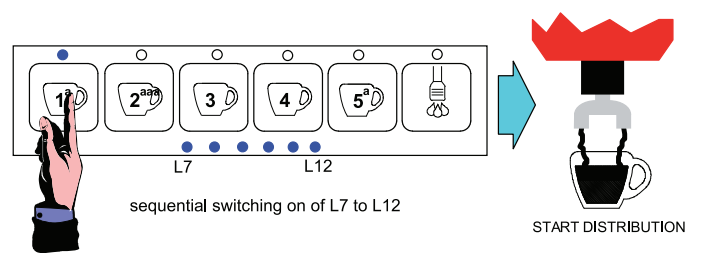
STOP COFFEE DISTRIBUTION IN PROGRESS

It is possible to interrupt the distribution in progress before reaching the programmed impulses on the flow meter by pressing any one of the dose buttons on the keyboard of the group used for distributing the product.
This operation immediately de-energizes both the distribution solenoid valve EVx and the PUMP, interrupting the distribution of the product and returning the doser to idle-on status. All LEDs on the keypad are in the ON state.
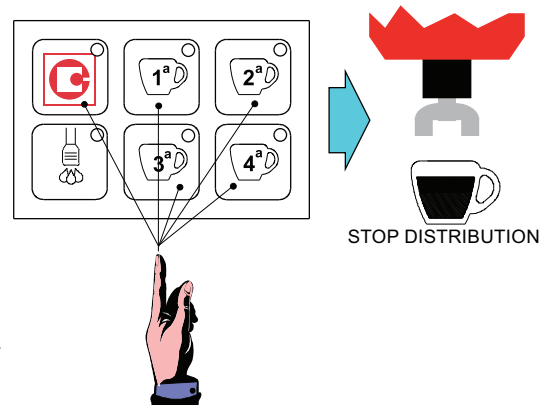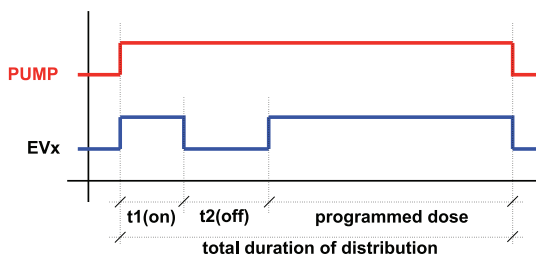
STOP DISTRIBUTION

NOTE: As well as normal management of STOP DISTRIBUTION (see above), the 6T/12L

keypad also provides management of the "DOSE LEVEL" LEDs on the keypad (L7GRX - L12GRX). Once the dose underway is stopped as described in the previous paragraph, these will remain in the same "dose level" state as before the STOP distribution for a period of about 10", after which they will switch OFF.

6 KEY / 12 LED KEYPAD

example of "dose level" on STOP distribution
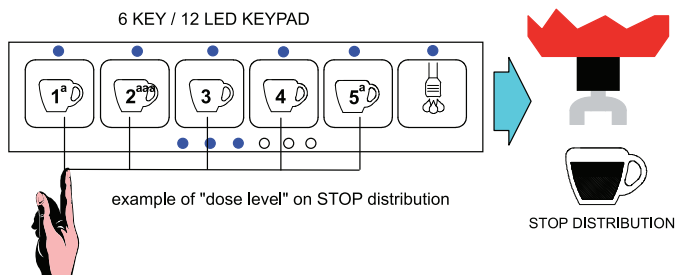
STOP DISTRIBUTION

PRE-BREWING

The 3d5 MAESTRO DELUXE doser may be configured in such a way that the distribution of coffee doses with volumetric control is preceded by pre-brewing. When dosing starts, the group solenoid valve EVx switches off after the time t1(on) and remains off for the time t2(off); it is then re-energised to complete the dose as programmed. This timed on/off does not involve the PUMP actuator.

When one of the dose buttons with volumetric control is pressed, the "normal" distribution cycle is precede by a short timed jet of water used to moisten the coffee capsule before moving on to the actual distribution.

ATTENTION: the times t1(on) and t2(off) can be set in the TECHNICAL LEVEL Programming for all coffee doses. If a zero value is assigned to one or more quantities, this function, though active, is not performed! To enable, see TECHNICAL LEVEL Programming.

PUMP

EVx

t1(on)   t2(off)   programmed dose

total duration of distribution

COFFEE DISTRIBUTION IN CONTINUOUS MODE

From idle-on status, pressing one of the dose buttons **K5GRx** (continuous/programming), both the distribution solenoid valve **EVx** and the **PUMP** are activated, starting the distribution phase. The LED **L5GRx** for the button of the chosen dose remains lit during the whole distribution of coffee.

START DISTRIBUTION
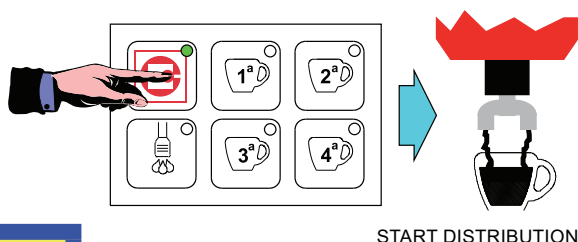
the display shows:

Continuos dose

To interrupt distribution in continuous mode, STOP the dose by pressing any dose button on the keyboard used for distributing the product. This de-energizes the solenoid valve and pump, and consequently the warning led switches off.
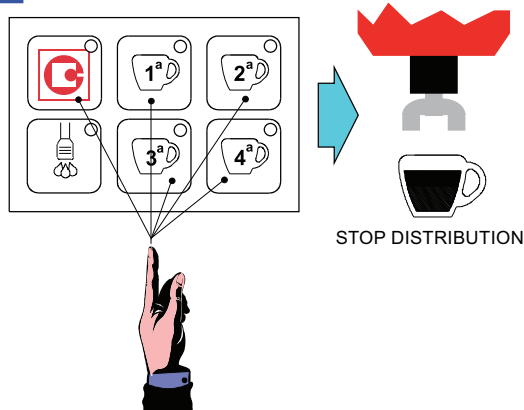
Distribution in continuous mode is stopped automatically (if no stop command is given) when the maximum product quantity is reached; this quantity may be controlled both volumetrically when 6000 impulses are reached and by means of a distribution time-out (see ALARMS paragraph).

STOP DISTRIBUTION

IMPORTANT: THE "CONTINUOUS" CYCLE IS STARTED WHEN THE BUTTON K5GRx IS RELEASED (WITHIN 5 SECONDS, OTHERWISE THE PROGRAMMING PHASE BEGINS) AND NOT WHEN IT IS PRESSED. INSTEAD THE STOP DOSE OCCURS WHEN THE BUTTON IS PRESSED.

TEA CYCLE DISTRIBUTION

When the button for the Tea dose (**K6GRx**) is pressed the tea solenoid valve (**EVTEA**) is activated, starting the distribution of hot water. The operation is indicated by the lighting of the LED (**L6GRx**) corresponding to the button pressed.
At the time of starting the cycle a Timer is activated which stops product distribution once the time value set during programming is reached.
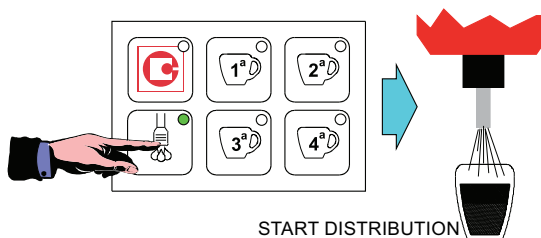
The doser allows simultaneous distribution of both the tea and the coffee cycles.

START DISTRIBUTION

the display shows:

Brewing   Gr:x
Tea
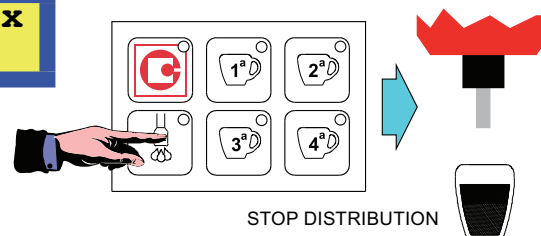
Stop tea distribution in progress

It is possible to interrupt the distribution in progress before reaching the programmed time by pressing the same button used to start the distribution of the dose of tea. This operation immediately de-energizes the solenoid valve EVTEA , interrupting the

STOP DISTRIBUTION

distribution of the product and returning the doser to idle-on status.

ATTENTION: THE 3d5 MAESTRO DELUXE DOSER CONTEMPLATES THREE DIFFERENT TEA DOSES (ONE FOR EACH GROUP).

TEA + PUMP

It is possible to combine the distribution of tea with the pump. See TECHNICAL LEVEL Programming.
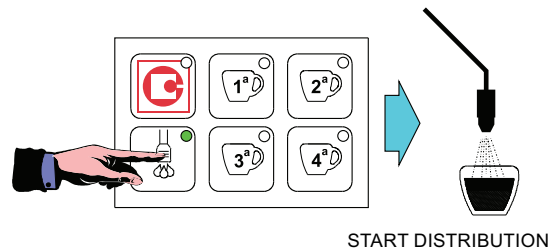
STEAM SPOUT DISTRIBUTION CYCLE

This function and the keyboard for performing it can be activated in the TECHNICAL LEVEL Programming (see paragraph).

Steam is enabled only with the doser lit and when the minimum level has been reached (probe SLIVMIN covered).

Only at the time of switching on does the doser wait for the boiler to be completely filled.

The temperature of the liquid heated by the steam is measured by means of a temperature probe positioned on the steam spout and connected to the STLVAP input. When the button **K4GRx** is pressed the solenoid valve **EVVAP** is energised until the temperature set in Programming for Simulation is reached (see paragraph below).

START DISTRIBUTION

the display shows:

Vapore

However it may be interrupted in advance by pressing the steam button again.

Once the programmed temperature has been reached, it is possible to continue distributing steam by holding down the steam button.

If the temperature is not reached within 120 seconds, steam distribution is ended automatically.

The system allows the simultaneous distribution of coffee, tea and steam.

In case of simultaneous operation of two or more of the above, the display shows the respective messages alternately.

DISTRIBUTION FROM STEAM WAND CYCLE (IF MANAGED BY SLAVE BOARD)

This function and the keyboard for performing it can be activated in the TECHNICAL LEVEL Programming (see paragraph). Steam is enabled only with the doser lit and when the minimum level has been reached (probe SLIVMIN covered). The doser waits for the boiler to be completely filled at the moment of switching on only. The temperature of the liquid heated by the steam is measured by means of a temperature probe positioned on the steam wand and connected to the STLVAP input. When the button K6GRx is pressed the solenoid valve EVVAP is activated until the temperature set in Programming for Simulation is reached (see paragraph below).

START DISTRIBUTION

the display shows:

Brewing   Gr:x
Steam

However it may be interrupted in advance by pressing the steam button again.
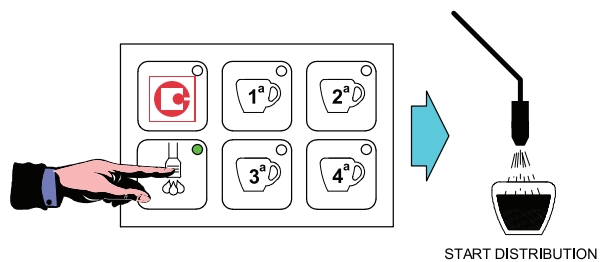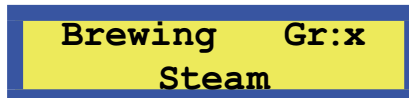
Once the programmed temperature has been reached, it is possible to continue distributing steam by holding down the steam button. Once steam dosing is complete, steam wand washing commences automatically (for the washing time given in the paragraph TECHNICAL LEVEL PROGRAMMING). If the temperature is not reached within 120 seconds, steam distribution is ended automatically. The system allows the simultaneous distribution of coffee, tea and steam. In the event of simultaneous distribution, the selections are displayed in succession from the first to the last.

STOP STEAM DISTRIBUTION IN PROGRESS

It is possible to interrupt the distribution in progress even when the programmed temperature has not been reached by re-pressing the same button as used to start distribution of the dose of steam. This operation immediately de-energises the solenoid valve EVVAP, interrupting distribution of the steam and returning the doser to idle-on state.

LEVEL MANAGEMENT AND REGULATION

MINIMUM LEVEL PROBE

At Power-on, the doser detects the status of the minimum level probe. If there is no water, the **ON/OFF** control (which the customer will have connected as he prefers to the heating resistance remote control switch or other actuator) is kept de-energised to protect the heating resistance against dry operation.

NOTE: When the system is switched on, the control of the minimum level probe is enabled after about 6 seconds.

Whenever the minimum level probe in the boiler does not detect the presence of liquid for 3 seconds, the **ON/OFF** switch is de-energised to protect the heating element and this is shown on the display.

the display shows:

Boiler
Empty
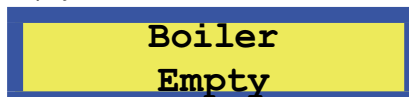
When the minimum level probe again detects the presence of water for 3 consecutive seconds, the **ON/OFF** actuator is re-enabled and consequently the heating, and the alarm disappears from the display.

Note: the minimum level probe does not control or manage filling, as this function is performed by the level probe.

CHRONO FUNCTION

The CHRONO function can be activated in the TECHNICAL LEVEL Programming (see paragraph). It enables the time of coffee distribution to be displayed in seconds for the respective groups. As soon as a dose is activated, the following is displayed:

the display shows:

```
Brewing        Gr:x
xxxxxx         zzz
```

Where
- XXX is the drink selected
- ZZZ are the seconds which increase even when the flow meter receives no pulses.
This is displayed for 5 seconds from the end of the last distribution, after which IDLE-ON is again displayed.
In the event of simultaneous distribution, the selections are displayed in succession from the first to the last.
In the event of a flow meter alarm, the alarm is displayed until interruption of the dose by the user (or due to flow meter time-out), after which the duration of the dose is displayed for 5 seconds.

DISABLING TEMPERATURE DISPLAY

The TEMPERATURE DISABLING function can be activated in the TECHNICAL LEVEL Programming (see paragraph). It disables display of the temperature measured by the boiler temperature probe.

the display shows:

```
ON             hh:mm
     SANREMO
```

Where the message ON identifies activation of the heating remote switch ON/OFF relay by the user.

DISTRIBUTION GROUPS WASHING

6 KEY / 12 LED KEYPAD

To active the DISTRIBUTION GROUPS WASHING CYCLE, with the doser in IDLE-ON state, just press the continuous button (K5GRx) and then the first dose button (K1GRx) corresponding to the group you want to wash. LEDs L5GRx and L1GRx corresponding to the group concerned start flashing to confirm that the washing cycle is underway.
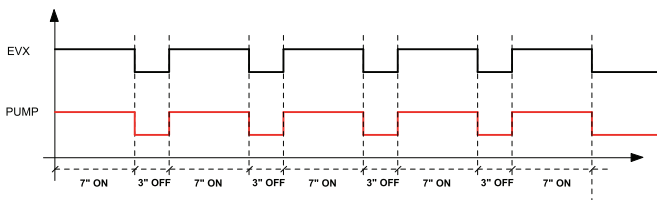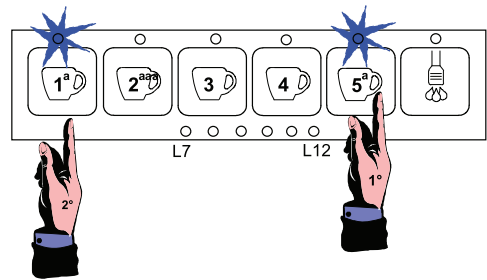
Washing is performed by energising the EVx actuators (where X may be 1, 2 or 3 corresponding to the group being washed) and PUMP actuators according to the times shown below.

The cycle consists of energising of the PUMP and EVx actuators for 7 seconds, followed by de-energising for a further 3 seconds. This is repeated 5 times.   At the end of a washing cycle, the system automatically switches back to the IDLE-ON state.
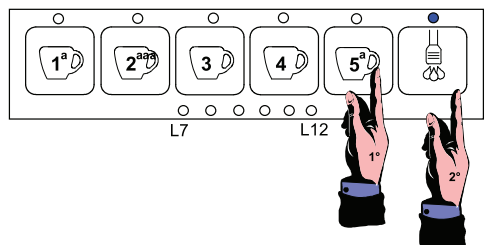NOTE: washing may be performed as many times as you wish and simultaneously on three groups.
NOTE1: you can interrupt the washing cycle before conclusion by pressing any distribution button for the group concerned.

STEAM WAND/CAPPUCCINO MAKER WASHING (IF PRESENT ON THE SLAVE BOARD)

6 KEY / 12 LED KEYPAD

To active the STEAM WAND/CAPPUCCINO MAKER WASHING CYCLE, with the doser in IDLE-ON state, just press button K5GRx then the button (K1GRx) corresponding to the group on which the steam is active. The L6GRx LED corresponding to the group concerned remains lit to confirm that the washing cycle is underway. The other LEDs in the group switch off.

Washing is performed by energising the EVVAP and EVLAV actuators according to the times shown below.
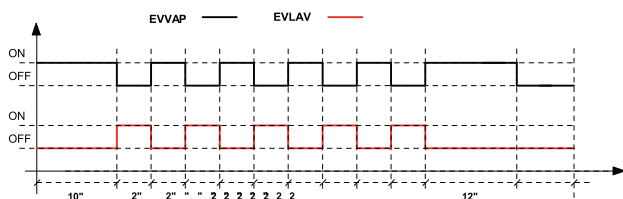
The cycle consists of energising EVVAP for 10 seconds, then alternating EVLAV for 2 seconds and EVVAP for 2 seconds. This is repeated 5 times. At the end, EVVAP remains energised for 12 seconds.   At the end of a washing cycle, the system automatically switches back to the IDLE-ON state.

NOTE: you can interrupt the washing cycle before conclusion by pressing any distribution button for the group concerned.
NOTE1: you can distribute coffee and tea from all groups during steam wand washing.

LEVEL PROBE

At Power-on, the doser detects the status of the level probe in the boiler and, if necessary (lack of water), it orders the filling phase by energising the filling solenoid valve **EVLIV** and the **PUMP** until the correct level of water is restored in the boiler.
(Time-out contemplated in the programmable filling phase - see TECHNICAL LEVEL Programming)

NOTE: When the system is switched on, the level control and regulation are enabled after about 6 seconds.

Whenever the level probe in the boiler does not detect the presence of liquid for 3 seconds, the filling phase is activated by energising the filling solenoid valve **EVLIV** and the **PUMP.** When the probe again detects the presence of water for 3 consecutive seconds, the filling phase is interrupted by de-energising the filling solenoid valve **EVLIV** and the **PUMP.**

BOILER LEVEL KO ⊃ EVLIV + PUMP = ON   **BOILER LEVEL OK ⊃ EVLIV + PUMP = OFF**
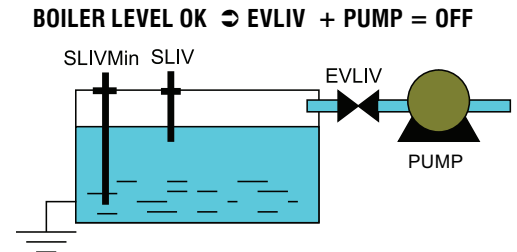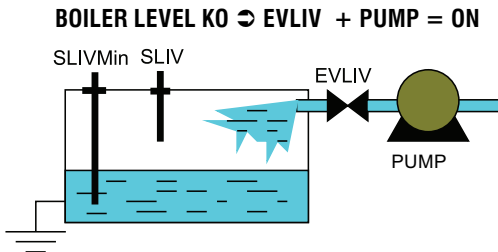
The filling phase does not influence the possibility of both making coffee or tea selections and their new programming. Only the intervention of the Time-out associated with the filling phase inhibits the functionality of the keyboard and of the actuators.
At the first regulation of the water level in the boiler, the system waits for the level probe to be covered before activating the **ON/OFF** relay.
It is possible to vary the sensitivity of the level probes by means of a parameter in the TECHNICAL LEVEL Programming which offers the following possibilities:

-> LOW sensitivity	150kΩ	for example in the presence of a water softener
-> MEDIUM sensitivity	**400KΩ**	**normal water**
-> HIGH sensitivity	1MΩ	for example in the case of mountain water or of a sight glass

COFFEE BOILER HEATING

CHARACTERISTICS

The heating control is enabled for dosing in IDLE-ON status and uses a temperature probe and a control for the low voltage resistance.
At the first regulation the heating is activate only AFTER the level has been reached in the boiler, to protect the resistance.
In all other cases the heating is active if necessary except when the minimum level probe is uncovered; in this condition, heating is blocked immediately.

REGULATING MODES

Control may be exerted in 2 modes.

WITH ON/OFF REGULATION WITH 2°C HYSTERESIS

Temperature regulation is realised with a hysteresis of 2°C. The resistance is controlled by the ON/OFF relay which is de-energised when the programmed temperature T°SET is reached (see TECHNICAL LEVEL Programming) and it is re-energised when the temperature falls by 2°C. A timed filter is also fitted to avoid vibrations on the threshold of intervention.
To activate this function it is necessary to set **all the pid constants at 0** in the TECHNICAL PROGRAMMING (see specific paragraph).

WITH PID REGULATION (DEFAULT SETTING)

The temperature regulation is carried out following a proportional, integrative and derivative algorithm. (see TECHNICAL LEVEL Programming for the setting of the parameters)
The heating control is enabled for dosing in IDLE-ON status and uses a temperature probe and a RISCAF low voltage control for Triac or solid state relays with PID function.
The temperature regulation is carried out following an algorithm that uses 3 constants:
- proportional (kp)
- integrative (ki)
- derivative (kd)

The three constants must be adapted to every type of coffee doser according to the power characteristics of the resistance, the dimensions of the boiler, its heat loss, etc.
The "set point value or T°SET" is the temperature that the boiler must be at during normal operation.

- If the temperature swings excessively around the T°SET in the heating or holding phase, with peaks of value that do not diminish over time, it is necessary to decrease the proportional constant: Kp

- If the temperature swings excessively around the T°SET in the holding phase, with a very long period of oscillation and with peaks of value that do not diminish over time, it is necessary to decrease the proportional integrative constant: Ki

- If the temperature has an excessive oscillation and is often larger than the T°SET during the heating or holding phase, but it attenuates as time passes, it is necessary to decrease the derivative constant: Kd

- If the temperature tends to be below the T°SET value during the heating phase, getting farther away from it, it is necessary to increase the derivative constant: Kd

- If the temperature tends to be constantly below the T°SET value during the heating phase, it is necessary to increase the proportional constant:

Kp and also slightly increase the integrative constant: Ki

- If the temperature tends to be constantly below or above the T°SET value during the holding phase, it is necessary to increase the integrative constant: Ki and also slightly increase the proportional constant: Kp

- Si pendant la phase de maintien la température tend à se maintenir au-dessous ou au-dessus de la valeur de T°SET de façon constante, il faut augmenter la constante intégrale: Ki et augmenter légèrement également la constante proportionnelle : Kp

PROGRAMMING AND READINGS

PROGRAMMING COFFEE DOSES

It is possible to modify and memorise the quantities for volumetric coffee doses following the procedure described below

1) In IDLE-ON status press the button **K5GRx (1..3)** and hold it down for longer than 5 seconds; check that the led **L5GRx (1..3)** changes from fixed to flashing.

the display shows:

```
Doses setting
Select within10s
```
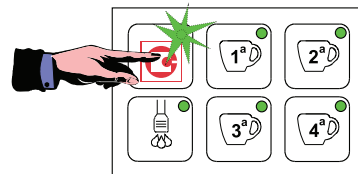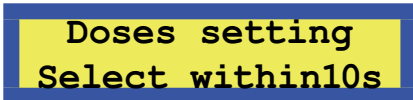
2) Within **10 seconds** (time-out for leaving the programming phase) press any one of the buttons associated with the 4 doses that can be programmed (for example **K1GRx**). The LED for the button **K5GRx** remains lit as does that of the dose being programmed (in our example **L1GRx**). The **EVx + PUMP** actuators are enabled for the whole duration of coffee dose programming.
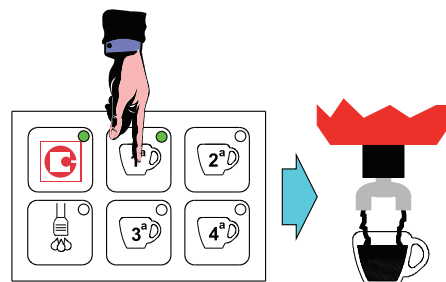
START DISTRIBUTION

3) When the coffee quantity at which you want to programme the dose is reached, press any one of the "coffee" buttons on the keyboard of the group being programmed to interrupt the distribution of the product with the consequent de-energising of **EVx + PUMP**. The new value of the dose, expressed in impulses of the flow meter, is memorised in the EEPROM.
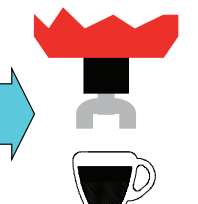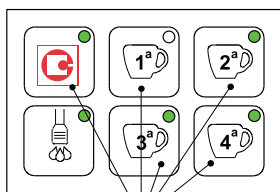
STOP DISTRIBUTION

At the same time the led for the programmed dose switches off and the remaining leds switch on; it is then possible to programme the remaining doses (also tea and steam doses if enabled) without having to repeat the input operation (see point 1).

EVx + PUMP = OFF

• **To programme the remaining coffee doses (if the programming time-out of 30 seconds has not been exceeded), repeat points (2) and (3) in sequence.**
• **If the programming time-out (30 seconds) has intervened, to proceed with programming you must repeat the entire sequence described in points (1), (2) and (3).**
• **The leds for the doses "already programmed" are off if you decide to return to programming. However this does not prevent a "new" programming of the doses already programmed** (this condition cannot occur if a dosing ON/OFF operation has been performed after programming).

IMPORTANT: the programming carried out on the FIRST GROUP is ALWAYS automatically transferred to all the other groups too. However this does not affect the possibility of programming the remaining groups independently of the first by means of the operations described in points (1), (2) and (3).

> ATTENTION: IF THE "PRE-BREWING" FUNCTION IS ACTIVE (SEE SPECIFIC PARAGRAPHS), THE DOSER CURRENTLY BEING PROGRAMMED ALWAYS ENABLES THIS PARTICULAR FUNCTION. SO WAIT UNTIL IT IS ENDED BEFORE STOPPING THE DISTRIBUTION IN PROGRESS.

NOTE: during programming of one group the other groups remain disabled, as well as the distribution of tea and steam if enabled.

## IF A COFFEE DOSE DOES NOT WORK...

Solving possible problems:

if after programming of a volumetric dose, this dose is not given, it is possible that the doser, for some reason, has not received the impulses from the flow meter and has therefore programmed a dose of 0 impulses.

Possible causes to check: flow meter incorrectly connected, flow meter exchanged with that of another group, water circuit not operating.

PROGRAMMING CONTINUOUS/3COFFEES DOSE

The continuous dose button can also be programmed on the K5GRx buttons. The programming procedure is the same as for the other 4 doses on each keypad explained previously. During programming, the following is displayed:
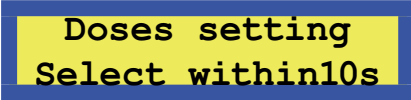
the display shows:

```
Setting      Gr.x
    Continuos
```
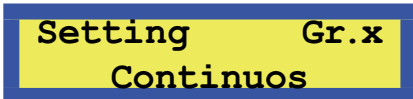
During programming, only the LED corresponding to the continuous/3coffee button being programmed remains lit.

PROGRAMMING TEA DOSES

It is possible to modify and memorise the quantities for tea doses (with timed control) following the procedure described below:

1) In IDLE-ON status press the button **K5GRx (1..3)** and hold it down for longer than 5 seconds; check that the led **L5GRx (1..3)** changes from fixed to flashing.

the display shows:

```
Doses setting
Select within10s
```

2) Within **10 seconds** (time-out for leaving the programming phase) press the button **K6GRx** associated with the tea dose. The led for the button **K5GRx** remains lit.

The actuator **EVTEA** is enabled for the whole duration of programming the tea dose.

3) When the tea quantity at which you want to programme the dose is reached, press again the button **K6GRx** used previously to interrupt the distribution of the product with consequent de-energising of **EVTEA**.

The new time for the duration of the tea dose is memorised.

- **To programme the remaining tea doses (if the programming time-out of 30 seconds has not been exceeded and you have not entered programming from group 1 by pressing the button K5GR1), repeat points (2) and (3) in sequence.**
- **If the programming time-out (30 seconds) has intervened, to proceed with programming you must repeat the entire sequence described in points (1), (2) and (3).**
- **The leds for the doses "already programmed" are off if you decide to return to programming. However this does not prevent a "new" programming of the doses already programmed** (this condition cannot occur if a dosing ON/OFF operation has been performed after programming).

IMPORTANT: the programming of the tea dose carried out on the FIRST GROUP is NEVER automatically transferred to all the other groups too. To programme the tea dose on the remaining groups it is sufficient to repeat the operations described in points (1), (2) and (3).
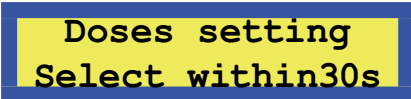
NOTE: during programming of one tea, the groups and the distribution of other teas remain disabled.

PROGRAMMING STEAM TEMPERATURE BY SIMULATION

It is possible to modify and memorise the temperature at which the **EVVAP** must be deactivated. The temperature may be programmed by simulation, following the procedure described below.

1) In IDLE-ON status press the button **K5GRx (1..3)** and hold it down for longer than 5 seconds; check that the led **L5GRx (1..3)** changes from fixed to flashing.

the display shows:

```
Doses setting
Select within30s
```

2) Within **30 seconds** (time-out for leaving the programming phase) press the button K6GRx associated with steam. The led for the button K5GRx remains lit.

The actuator **EVVAP** is enabled for the whole duration of programming.

3) When the desired temperature is reached (measured with an external probe or in another way chosen by GICAR), press again the button K6GRx used previously to interrupt the distribution of the product with consequent de-energising of **EVTEA**.
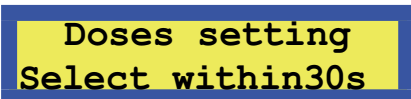
The new steam temperature value (steam spout) is memorised.

- **If the programming time-out (30 seconds) has intervened, to proceed with programming you must repeat the entire sequence described in points (1), (2) and (3).**

NOTE: during Steam programming the other groups are disabled.

PROGRAMMING THE CLOCK

With the display showing:

```
Doses setting
Select within30s
```

pressing the button **K5GRx (1 3)** again takes you to the clock adjustment

the display shows:

```
Clock adjust
```

press the button **K3GR1 (ENTER)** to confirm

the display shows:

```
Clock adjust
hh.mm   XXXXXXXXX
```

where: hh = present hour (0... 23)   mm = present minute   XXX = day of the week
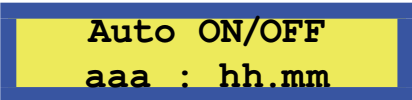
If you want to modify the parameter you must press the buttons **K1GR1 (+) or K2GR1 (-)**, and confirm with **K5GR1**.

Pressing the button **K5GR1** again takes you to the setting of automatic switching on.

AUTO ON/OFF - AUTOMATIC SWITCHING ON/OFF

Allows you to define the times for automatically switching the doser on and off and the weekly closing day.
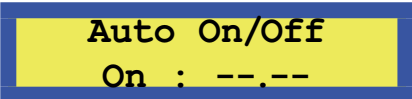
the display shows:

```
Auto ON/OFF
aaa : hh.mm
```

The following are programmed in this order:
- switch-on hour (AAA = On)
- switch-on minute (AAA = On)
- switch-off hour (AAA = Off)
- switch-off minute (AAA = Off)
- rest day

To pass from one to the other, press the button **K5GR1**. You can set 1 switch-on and 1 switch-off and these apply to every day of the week.

If you do not want automatic switching on or off, you must go to the programming of the corresponding time and press **K1GR1 (+)** or **K2GR1 (-)** until the display appears as follows:
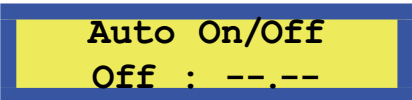
the display shows:

```
Auto On/Off
On : --.--
```

or

the display shows:

```
Auto On/Off
Off : --.--
```

(pressing **K2GR1 (-)** when the display shows the hour 00 or pressing **K1GR1 (+)** when it indicates the hour 23).

In this case:
- if switch-on has been disabled, switch-off and the rest day are also automatically disabled; pressing **K5GR1** skips the respective settings and moves directly to the next parameter. Switching on and off can therefore be done only by hand with the procedure described in the previous paragraph.
- if switch-on is enabled, pressing **K5GR1** moves on to the setting of switch-off and then to the rest day, if necessary.

REST DAY

It is possible to define a weekly rest day, on which the doser ignores automatic switch-on and can be switched on only by hand.

Instead, automatic switch-off is active also on the rest day.

the display shows:

```
Closed On
xxxxxxxx
```

Using **K1GR1 (+) or K2GR1 (-)** select the day (XXX).

If you do not want to set a rest day you must select "------------".

It is possible to set only one rest day.

READING CONSUMPTION, LITRES, MAINTENANCE

With the display showing:

```
Clock adjust
```

pressing the button **K5GR1** again takes you to reading of the counts:

the display shows:

```
Counters
```

press the button **K3GR1 (ENTER)** to confirm

the display shows:

```
Litres
xxxxx
```

the litres used up to that moment are shown.

press the button **K5GR1** to move on to the number of cycles carried out up to that moment.

the display shows:

```
Service
xxxxx
```

press the button **K5GR1** and the total number of coffees distributed up to that moment is shown.
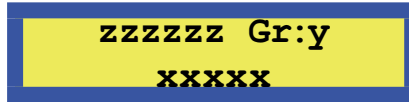
the display shows:

```
Coffees total
xxxxx
```

press the button **K5GR1** to review all the counts and the totals of the individual doses of each group are shown.

the display shows:

```
zzzzzz Gr:y
  xxxxx
```

where y is the group   zzzzz = is the type of coffee   xxxxx = is the number of coffees

At the end of the review, pressing the button **K5GR1** allows you to leave this phase.

TECHNICAL LEVEL PROGRAMMING

Entering the environment for TECHNICAL LEVEL Programming allows the programming of particular parameters or functions.

To access TECHNICAL LEVEL Programming, go into OFF status and hold down the button **K5GR1** for 10 consecutive seconds.

PRESS IN OFF STATUS FOR 10 SECONDS

Note: access to TECHNICAL LEVEL Programming and the programming operations can be carried out only from the keyboard for group 1.

6 BUTTON KEYBOARD

6 BUTTON KEYBOARD

5 BUTTON KEYBOARD
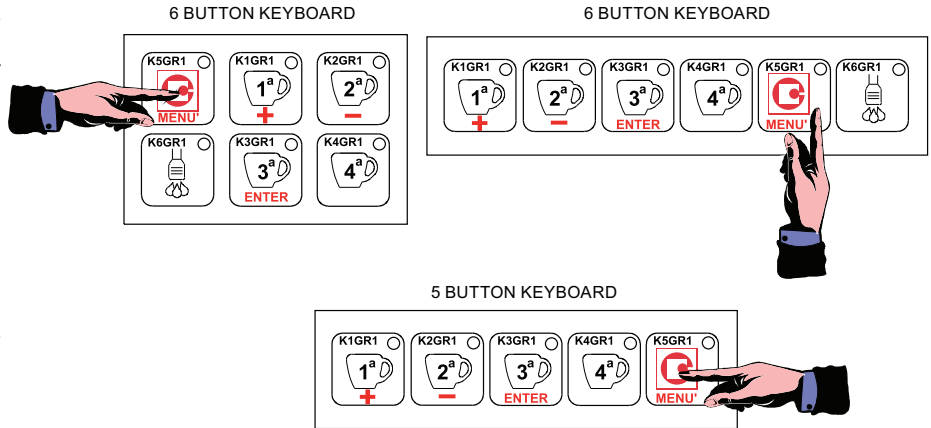
When TECHNICAL LEVEL Programming is accessed as described above, the first TECHNICAL parameter appears on the display, that is the set LANGUAGE:

the display shows:

```
 Language
xxxxxxxxx
```
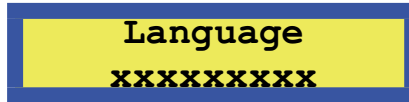
where xxx = English, Italian, French, German, Spanish

If you want to modify the parameter displayed, it is necessary to use the buttons **K1GR1 (+) or K2GR1 (-)** to select the various options available; to move on to the display of the next parameter press **K5GR1 (MENÙ)**.

The USER NAME is displayed.

the display shows:

```
   Name
 SANREMO
```

If you want to modify the parameter (message) use the buttons **K1GR1 (+) or K2GR1 (-)** to select the letters of the alphabet; when the letter/symbol/number under the blinking cursor is the one you want, press the button **K3GR1 (ENTER)** to confirm the letter/symbol/number and go on to select the next letter/symbol/number.
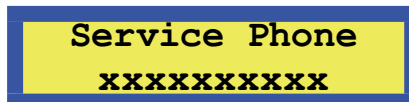
Arrangement of the characters available:

| blank	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3
4	5	6	7	8	9	:	;	<	=	>	?	@	A	B	C	D	E	F	G
H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[
¥	]	^	_	`	a	b	c	d	e	f	g	i	j	k	l	m	n	o	p
q	r	s	t	u	v	w	x	y	z										

To move on to the next menu press the button **K5GR1 (MENÙ).**

The setting of a telephone number is shown; this number must be displayed in the case of certain alarms.

the display shows:

```
Service Phone
 xxxxxxxxx
```

where xxx are the figures that make up the telephone number. After programming of the SERVICE PHONE, move on to the following parameter by pressing K5GR1 (MENU). This takes you to setting of the CHRONO function.

the display shows:

```
Function Crono
 xxxxxxxxxx
```
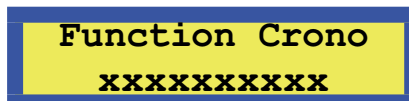
Where XXX may be ENABLE/DISABLE:

If you want to modify the parameter, press the buttons K1GR1 (+) or K2GR1 (-) to select one or the other.   When the CHRONO function is enabled, the time in seconds (increasing) corresponding to the dose being distributed is displayed.

After programming of the CHRONO function, move on to the following parameter by pressing K5GR1 (MENU). This takes you to setting of the DISP. TEMPERAT. If enabled, this enables the temperature measured by the temperature probe to be displayed.

the display shows:

```
Disp. Temperat.
  xxxxxxxxx
```
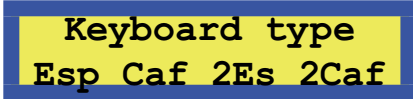
Where XXX may be ENABLE/DISABLE

where XXX are the numbers that make up the telephone number.

After having programmed the SERVICE PHONE, press K5GR1 (MENÙ) to move on to the next parameter; this takes you to the setting of the type of KEYBOARD used on the doser and it applies to all the keyboards used for the three groups.
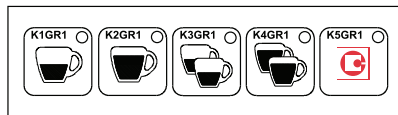
the display shows:

```
Keyboard type
Esp Caf 2Es 2Caf
```

Select "Esp - Caf - 2Es - 2Caf" when the keyboards used are of the type:
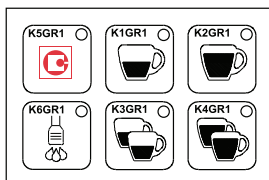
5 BUTTON KEYBOARD

6 BUTTON KEYBOARD

6 BUTTON KEYBOARD

Select "Esp - 2Es - Cof - 2Cof" (pressing the buttons **K1GR1 "+" o K2GR1 "-"** to display the preferred option) when the keyboards used are of the type:
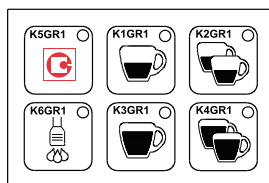
the display shows:
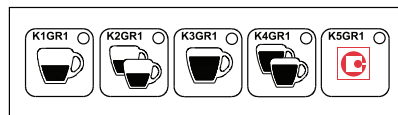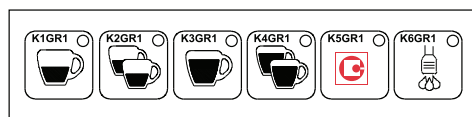
```
Keyboard type
Esp 2Es Caf 2Caf
```

After having set the type of keyboard, pressing the button **K5GR1 (MENU)** allows you to move on to the display where you can enable or disable the programming of the doses
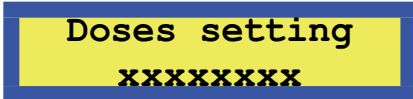
5 BUTTON KEYBOARD
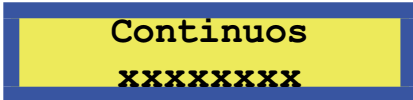
6 BUTTON KEYBOARD

6 BUTTON KEYBOARD

the display shows:

```
Doses setting
  xxxxxxxx
```

where xxx may be "DISABLE" or "ENABLE"

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-).**

After having finished the setting, pressing the button **K5GR1 (MENU)** allows you to move on to the display where you can enable or disable continuous dose distribution.
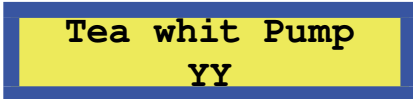
the display shows:

```
Continuos
  xxxxxxxx
```

where xxx may be "DISABLE" or "ENABLE"

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-).**

After having finished the setting for enabling or disabling the "continuous" dose, pressing the button **K5GR1 (MENU)** allows you to move on to the display where you can choose to associate the pump with tea distribution.

the display shows:

```
Tea whit Pump
    YY
```

where YY may be "NO" or "YES"

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-).**

After having finished the setting for enabling or disabling tea with the pump, pressing the button **K5GR1 (MENU)** allows you to move on to the display where you can choose the function for setting the keyboard where the button K6Grx will command not tea but steam.

the display shows:

```
Steam Boiler Gr.
      x
```

where x may be ''0'' or "1" or "2" or ''3''

0 = disabled

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-).**

After having finished the setting for choosing the keypad for the steam button, pressing the button K5GR1 (MENU) allows you to move on to the display for choosing the duration of steam wand washing.

the display shows:

```
     Cleaning
     Xxxxxxx
```

where xxx is the duration of washing in seconds (from 0 seconds to 10 seconds; at 0 seconds, washing is disabled)

After having finished the setting corresponding to the duration of steam wand washing, pressing the button K5GR1 (MENU) allows you to move on to the display for choosing the PRE-BREWING function.

the display shows:

```
    PreBrewing

     xxxxxxx
```

where xxx may be "DISABLE" or "ENABLE"

If you want to modify the parameter for enabling/disabling pre-brewing, press the buttons **K1GR1 (+) or K2GR1 (-)**.

After having enabled the pre-brewing function, pressing the button **K5GR1 (MENU)** allows you proceed to set the **ON** and **OFF** parameters.

The first programmable ON time is the one for the buttons K1GR1, K1GR2, K1GR3 (in the graphic example of the display we refer to keyboards of the type Esp - Caf - 2Es - 2Caf).

the display shows:

```
  PreBrew.   xx sec
   yyyyy        z.z
```

where: xx = ON or OFF   zz = total pre-brewing ON time   yyyyy = espresso, 2 espressos, coffee or 2 coffees
Values from 0.1 to 5 in steps of 0.1 sec.

If you want to modify the parameter you must press the buttons **K1GR1 (+) or K2GR1 (-)** to increase or decrease the value.

After having completed programming of the pre-brewing times, press the button **K5GR1 (MENU)** to proceed to display the setting of the sensitivity level:

the display shows:

```
   ProbeSensivity

       xxx
```

where xxx may be:

sensitivity low   150kΩ   (low)   sensitivity mid   400KΩ   (medium)   sensitivity high   1MΩ   (high)

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-)**.

After having completed the setting, pressing the button **K5GR1 (MENU)** allows you to move on to the display for choosing the function of setting the number of cycles that can be performed (allowed distributions).

the display shows:

```
   Service Cycles

       xxxxx
```

where xxx may be a number from 0000 to 99000 in steps of 1000

when xxx is 0000 the function is disabled.

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-)**.

After having completed the setting, pressing the button **K5GR1 (MENU)** allows you to move on to the display for choosing the possibility of showing the temperature in degrees Celsius or Fahrenheit.

the display shows:

```
    Temperature
        °X
```

where °X may be "°C" or "°F"

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-)**.

After having completed the setting, pressing the button **K5GR1 (MENU)** allows you to move on to the display for setting the boiler setpoint temperature T°SET.

the display shows:

```
   Disp. Temperat.
        xxx
```

where xxx is a selectable value from 80 to 125°C in steps of 1°C.

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-)**.

After having completed the setting, pressing the button **K5GR1 (MENU)** allows you to move on to the display of the parameters for PID type thermostat control:

the display shows:

```
   kP     kI     kD
   xx.x   y.yy   zz.z
```

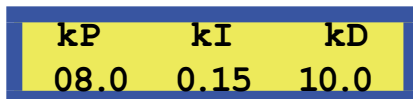where xx.x is the proportional correction constant
where y.yy is the integrative correction constant
where zz.z is the derivative correction constant
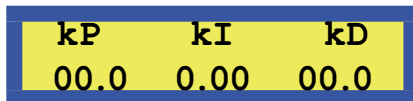each value may be selected from 0.1 to 99.9°C in steps of 0.1
The default regulation is PID with the following parameters:

the display shows:

```
kP      kI      kD
08.0    0.15    10.0
```

while to enable regulation with hysteresis of 2°C it is necessary to set all k at value 0

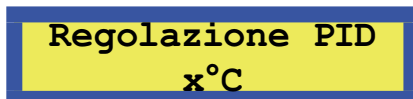the display shows:

```
kP      kI      kD
00.0    0.00    00.0
```

If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-).**
After having completed the setting, pressing the button **K5GR1 (MENU)** allows you to move on to the display for setting the range of regulation of the PID with respect to the setpoint temperature.
Outside this range the regulation is always on/off.

the display shows:

```
Regolazione PID
      x°C
```

where x is the value of the range in degrees and this value may be selected from 2 to 5°C in steps of 1°C
If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-)**.
After having completed the setting, pressing the button **K5GR1 (MENU)** allows you to move on to the display for setting the time-out for filling the water level in the boiler:

the display shows:

```
FillingUp T-Out
      xxx
```

Selectable value: from 10 to 250' in steps of 1 minute
If you want to modify the parameter, press the buttons **K1GR1 (+) or K2GR1 (-).**
After having programmed the time-out, press **K5GR1 (MENU)** to move on to the next menu; this takes you to the setting of the litres of the water-softener filter.

the display shows:

```
Water Filter
      xxxxx
```

where xxxxx is a selectable value from 0 to 5000 in steps of 1 litre.
If you want to modify the "water filter" parameter for the litres counted you must press the buttons **K1GR1 (+) or K2GR1 (-)** to increase or decrease the value.
Pressing the button **K5GR1 (MENU**) again takes you out of the TECHNICAL LEVEL Programming phase.
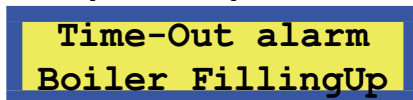
the display shows:

```
OFF          hh:mm
```

Note: once you have entered the TECHNICAL LEVEL Programming environment, to leave it you must scroll through all the menus by pressing the button K5GR1 (MENU) until it returns to OFF status.

ALARM SIGNAL

TIME OUT LEVEL IN BOILER (FILLING)

When this indication appears on the display:

```
Time-Out alarm
Boiler FillingUp
```
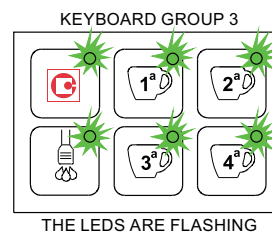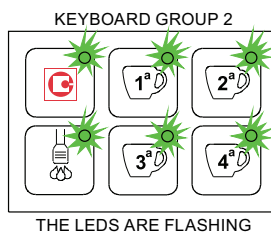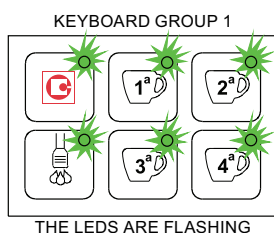
it means that the time for filling the water level in the boiler has been exceeded.
In fact, whenever the level probe detects the lack of water (probe uncovered) the filling phase is enabled (EVLIV + PUMP).
If EVLIV + PUMP remain energised continuously for a time longer than the time-out set in the TECHNICAL LEVEL Programming, all the principal functions of the doser are inhibited. The keyboards are disabled and the operation of all actuators is inhibited.
All the leds on the keyboards start to flash (½ ON, ½ OFF) to give a visual warning that the system is entering alarm status.

To leave the alarm warning status it is necessary to switch the doser off and on again.

KEYBOARD GROUP 1
THE LEDS ARE FLASHING

KEYBOARD GROUP 2
THE LEDS ARE FLASHING

KEYBOARD GROUP 3
THE LEDS ARE FLASHING

BOILER TEMPERATURE
PROBE SHORT CIRCUITING / EXCESS TEMPERATURE
In the case of a short circuited boiler temperature prone or in the case of a temperature higher than a determined value for 5 consecutive
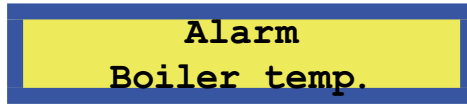
seconds, an alarm warning is given by making all the LEDs flash.

The alarm threshold is **140°C.**

The heating and the buttons of the boiler in alarm status are disabled. The distribution in progress is not aborted.
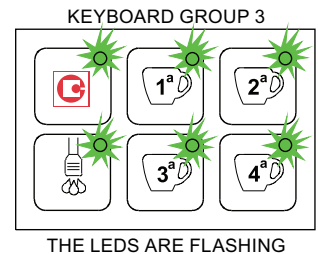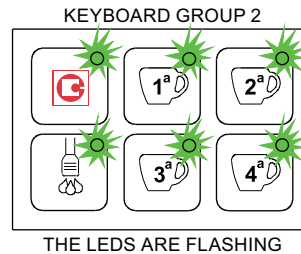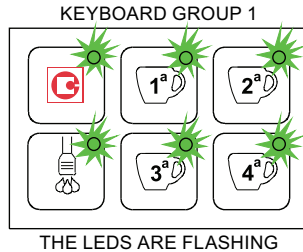
The following appears on the flashing display:

the display shows:

```
     Alarm
  Boiler temp.
```

The alarm disappears when the temperature returns within acceptable values.

The warning is removed by switching OFF the machine.

KEYBOARD GROUP 1

THE LEDS ARE FLASHING

KEYBOARD GROUP 2

THE LEDS ARE FLASHING

KEYBOARD GROUP 3

THE LEDS ARE FLASHING

BOILER PROBE UNCONNECTED / INTERRUPTED

If the boiler temperature probe is unconnected or interrupted or if it determines a temperature around 0°C, within 5 seconds an alarm indication is given by making all the LEDs on the keyboards flash.

The heating and the buttons of the boiler in alarm status are disabled. The distribution in progress is not aborted.
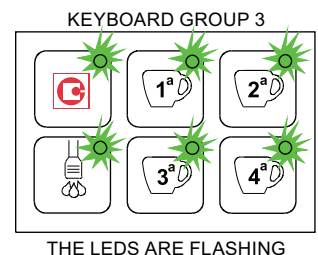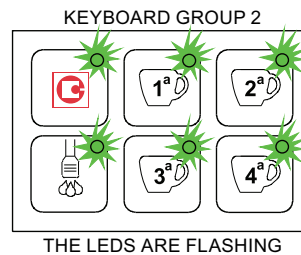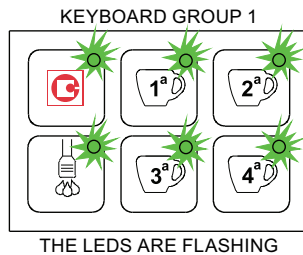
The following appears on the flashing display:

the display shows:

```
T.ProbeUnconnect
```

The alarm disappears when the temperature returns within acceptable values.

The warning is removed by switching OFF the machine.

KEYBOARD GROUP 1

THE LEDS ARE FLASHING

KEYBOARD GROUP 2

THE LEDS ARE FLASHING

KEYBOARD GROUP 3

THE LEDS ARE FLASHING

ABSENCE OF IMPULSES OF THE FLOW METER (5 SECONDS)

When this indication appears on the display:

```
     Alarm
Flow Meter   Gr.X
```

it means that the impulses are not arriving from the flow meter for the group activated (x).

In fact, after having started each volumetric dose (EVx + PUMP in both the distribution and programming phase), the doser checks the correct operation of the flow meter by measuring the impulses that is sends to the microcontroller.

If not impulses are detected for a period of more than 5 consecutive seconds, the led for the selected dose starts to flash (½ ON ½ OFF).

After 1 minute (flow meter time-out) of continued absence of impulses from the flow meter, the dose in progress is automatically stopped.

THE LED IS FLASHING
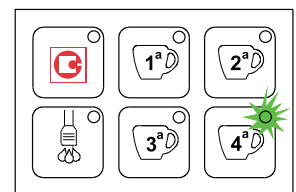
FILTER ALARM AND RESET

This function allows you to reset the distribution count. When this indication appears on the display:

```
ChangeWaterFilt
   xxxxxxxxx
```
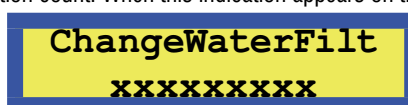
where xxx is the telephone number set as a suggestion

… it means that the filter has exceeded the number of litres that it can purify, as set in the TECHNICAL LEVEL Programming.

To reset this signal it is sufficient to supply power to the doser by holding down the buttons K3GR1 and K4GR1 simultaneously.

Pressing buttons to switch on the system

70

the display shows:

```
┌──────────────────────┐
│                      │
│     Filter Reset     │
│                      │
└──────────────────────┘
```

MAINTENANCE ALARM AND RESET

When this indication appears on the display:

```
┌──────────────────────┐
│      Service         │
│                      │
│      xxxxxxxx        │
└──────────────────────┘
```

where xxx is the telephone number set as a suggestion, it means that the number of cycles that can be performed (coffees distributed) as set in the *TECHNICAL LEVEL Programming* has been exceeded

To reset this signal it is sufficient to supply power to the doser by holding down the buttons K1GR1 and K2GR1 simultaneously.
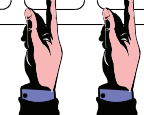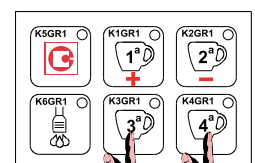
Pressing buttons to switch on the system

the display shows:

```
┌──────────────────────┐
│                      │
│    Service Reset     │
│                      │
└──────────────────────┘
```
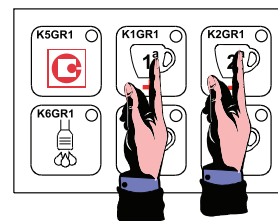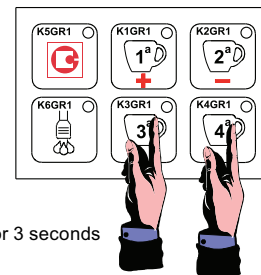
RESET TOTAL SINGLE DOSES

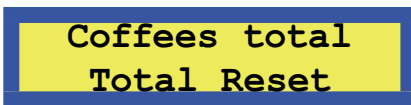It is possible to reset the count of the consumption of single doses.

To reset this signal you have to go to TECHNICAL LEVEL Programming, to the Total Reading menu, and hold down the buttons K3GR1 and K4GR1 simultaneously for 3 seconds.

the display shows:

```
┌──────────────────────┐
│                      │
│    Coffees total     │
│                      │
└──────────────────────┘
```

the display shows:

```
┌──────────────────────┐
│    Coffees total     │
│                      │
│     Total Reset      │
└──────────────────────┘
```

Pressing buttons for 3 seconds

ATTENTION: the total derived from the sum of all the distributions made for each button of each group cannot be reset.
Note: the consumption reset operation DOES NOT RESET the reading of the litres consumed; to reset this, refer to the specific paragraph.

PRESET DEFAULT DATA

The factory presetting allows you to delete the data memory completely and load standard values for all the memorised data.
This must be carried out, for example, after the programming of the microprocessor (on board software OBP) if that has also reset its EEPROM memory, or when a software update has affected one or more stored data or added new ones.

Only group 1 keyboard

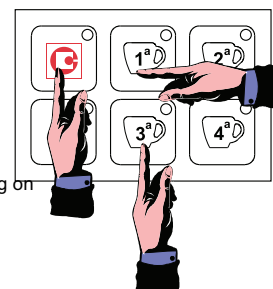So when switching on, hold down the buttons
K1GR1 + K3GR1 + K5GR1 simultaneously.

When preset is completed, the following appears on the display:

the display shows:

```
┌──────────────────────┐
│    Preset valori     │
│                      │
│     completato       │
└──────────────────────┘
```

Hold down simultaneously when switching on

To return to normal operation you must switch off and on again.

After a factory preset it is necessary to recheck and if necessary reset
all the machine parameters (bar/technician/factory/roaster), including the respective passwords (except the factory password which is fixed).
The factory preset also resets all the counters, including the total doses made.

PROCEDURES IN THE EVENT OF A POWER CUT

In the event of an interruption in the power supply, when power returns the doser resumes the status (IDLE-ON or OFF) that it was in at the time of the power cut.
Any distributions in progress are aborted.
All dosing data are memorised.

PROGRAMMING THE PIDBULL CONTROL UNIT
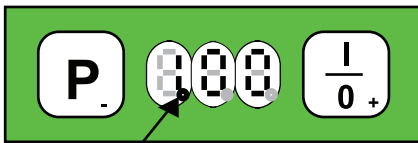
VERSION WITH 1 KEYBOARD

SWITCHING ON (VERSION WITH 1 KEYBOARD)

When the PIDBULL temperature control is fed by means of the external main switch, it resumes the "OFF" or "IDLE-ON" status that it presented before being disconnected from the mains (see "Procedures in the event of a power cut").

At the time of switching on, the display of the 1st group briefly shows the version of the software installed (x.yy).

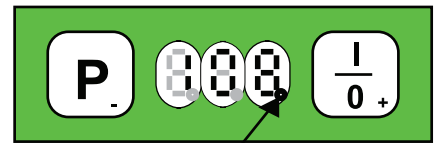### GROUP IDENTIFICATION (DECIMAL POINT, VERSION WITH 1 KEYBOARD)

To identify the information for each group, the decimal point at bottom right of the display is lit SEQUENTIALLY and continuously, as shown in the drawings below:

THE LIT POINT IDENTIFIES THE 1ST GROUP
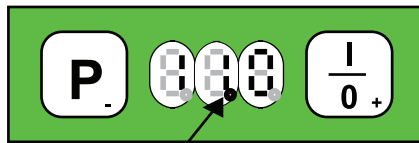
THE LIT POINT IDENTIFIES THE 2ND GROUP

THE LIT POINT IDENTIFIES THE 3RD GROUP

OFF STATUS (VERSION WITH 1 KEYBOARD)

With the control off (but the system fed) all the outputs are deactivated and all the functions are disabled.

The decimal point always runs from one display to the other.

IDLE ON STATUS (VERSION WITH 1 KEYBOARD)

When the button K+/ONOFF is pressed the PIDBULL control is switched on which thus activates all the heating devices simultaneously.

The control immediately checks the temperature of each boiler through the respective temperature probe NTCx and, according to the set temperature T°SET, commands the triac RESx if there is any need to heat one of the groups with type PID thermoregulation (see paragraph). In IDLE-ON condition, the programmed temperature will always be shown on the display, the default value is 100°C.

SWITCHING OFF ALL THE GROUPS (VERSION WITH 1 KEYBOARD)

To switch off the control on all groups SIMULTANEOUSLY, just hold down the button **K+/ONFF.GR1 for 3 seconds.**

PROGRAMMING T°SET (VERSION WITH 1 KEYBOARD)

The desired temperature may be programmed with this procedure:

Press the button K-/PROG.GR1 several times to choose the temperature to be modified, the display shows in sequence:

t1   group 1 boiler temperature
t2   group 2 boiler temperature
**t3**   group 3 boiler temperature

For example, if you want to modify the temperature "t2", just press the button **K+/ONOFF.GR1** to confirm and then, using the buttons **K+/ON/OFF** and **K-/PROG**, it is possible to modify the temperature value (within 5 seconds, otherwise you leave the programming phase).

The temperature may be set between **80°C** and **130°C.**

SWITCHING OFF A SINGLE GROUP

If it is not being used, and to avoid any alarms, it is possible to switch off the desired group individually by means of the programming phase, bringing the temperature one step below the minimum limit with the button **K-/PROG.GR1** until the word **OFF** appears.

During normal operation the word **OFF** will appear on the display with the decimal point for the group that is switched off.
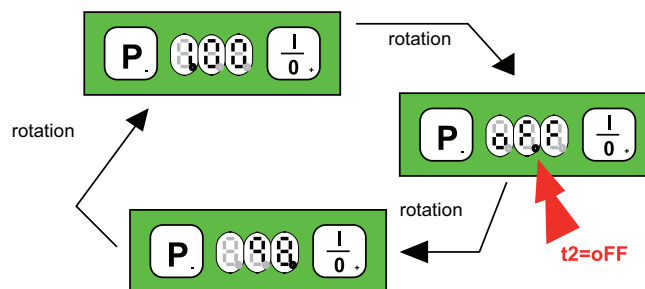
PID THERMOREGULATION

The thermoregulation of temperatures is achieved by commanding the
Triac according to a proportional, integrative and derivative algorithm, which is the same for all 3 groups (see TECHNICAL LEVEL Programming for the parameter setting); this is done 10°C before reaching the set temperature.

Before the 10°C proportional band, the command given to the Triac is of the full-mode type.

The temperature regulation is carried out following an algorithm that uses three constants:
- proportional: P.
- integrative: i.
- derivative: d.

The three constants must be adapted to every type of coffee machine according to the power characteristics of the resistance, the dimensions of the boiler, its heat loss, etc.

The "setpoint value or T°SET" is the boiler temperature that must be maintained.

- If the temperature swings excessively around the T°SET in the heating or holding phase, with peaks of value that do not diminish over time, it is necessary to decrease the proportional constant: P.

- If the temperature swings excessively around the T°SET in the holding phase, with a very long period of oscillation and with peaks of value that do not diminish over time, it is necessary to decrease the proportional integrative constant: i.

- If the temperature has an excessive oscillation and is often larger than the T°SET during the heating or holding phase, but it attenuates as time passes, it is necessary to decrease the derivative constant: d.

- If the temperature tends to be below the T°SET value during the heating phase, getting farther away from it, it is necessary to increase the derivative constant: d.

- If the temperature tends to be constantly below the T°SET value during the heating phase, it is necessary to increase the proportional constant "d" and also slightly increase the integrative constant "i".

- If the temperature tends to be constantly below or above the T°SET value during the holding phase, it is necessary to increase the integrative constant "i" and also slightly increase the proportional constant "P".

TEMPERATURE OFFSET

This function allows you to set a temperature offset by means of which it is possible to view on the display the temperature of the water coming down from the group with respect to the temperature measured by the probe **NTCx** (usually situated in the boiler), which will certainly not have the same value due to physical heat loss.

The offset value must be calculated by actually measuring the temperature of the water coming down from the group with respect to that shown on the display at the same moment.

This measurement is to be done by the customer as it varies according to the type of coffee machine and must be carried out first of all with the offset value set at 0°C.

This function can be better illustrated with an example:
if the TSET = 100°C
with OFFSET = 0°C thermostat control temp. = T°SET + OFFSET = **100°C** on display = **100°C**
with OFFSET = 10°C thermostat control temp. = T°SET + OFFSET = **110°C** on display = **100°C**
Note the difference in the thermostat control temperature but not in the temperature on the display.
The temperature offset is set by default at 10°C.

TECHNICAL LEVEL PROGRAMMING

Using the TECHNICAL LEVEL Programming it is possible to set:
- the heating groups   parameter on the display **F.01**
- the number of keyboards used   parameter on the display **F.02**
- the temperature display
  in degrees Celsius or Fahrenheit   parameter on the display **F.03**

- the value of the proportional constant   parameter on the display **P.**
- the value of the integrative constant   parameter on the display **i.**
- the value of the derivative constant   parameter on the display **d.**
- the value of the offset for group 1   parameter on the display **F.04**
- the value of the offset for group 2   parameter on the display **F.05**
- the value of the offset for group 3   parameter on the display **F.06**

To enter this phase you must supply power to the system by holding down simultaneously the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** on the **keyboard of the 1st group.**

when switching on
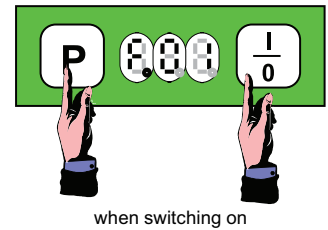
In this programming operation the button **K-/PROG.GR1** scrolls through the menus, while the button **K+/ON/OFF.GR1** confirms entry to a menu, and within the menu both buttons allow you to increase or decrease the parameter.
The parameter is memorised automatically, you just have to wait 2 seconds.
When the display that is showing the modified or non modified parameter shows the parameter again, for example F.0x , it means that it has been memorised.

F.01 = NUMBER OF HEATING GROUPS

On entering the programming phase, the display of the keyboard of the 1st group immediately shows the first parameter that can be modified which is the number of usable groups, which may be 1, 2 or 3.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be 3 or 2 or 1. If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

F.02 = NUMBER OF KEYBOARDS

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to set the number of keyboards that can be used.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be 3 or 1 (2 is not possible).

If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

F.03 = DEGREES CELSIUS OR DEGREES FAHRENHEIT

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to set the display in degrees Celsius or Fahrenheit.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be °C or °F .
If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

P: = PROPORTIONAL CONSTANT OF PID THERMOREGULATION

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to set the value of the proportional constant of PID thermoregulation.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be varied from 0.1 to 99.9 in steps of 0.1.
If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

i. = INTEGRATIVE CONSTANT OF PID THERMOREGULATION

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to set the value of the integrative constant of PID thermoregulation.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be varied from 0.1 to 99.9 in steps of 0.1.
If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

d: = DERIVATIVE CONSTANT OF PID THERMOREGULATION

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to set the value of the derivative constant of **PID** thermoregulation.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be varied from 0.1 to 99.9 in steps of 0.1.
If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 3 seconds for it to be automatically memorised.

F.04 = GROUP 1 OFFSET

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to change the temperature offset for group 1.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be varied from 1 to 30°C in steps of 1°C.
If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

F.05 = GROUP 2 OFFSET

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to change the temperature offset for group 2.
When confirmation is given with **K+/ONOFF.GR1** the previously set value of the parameter is shown which may be varied from 1 to 30°C in steps of 1°C.
If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

F.05 = GROUP 3 OFFSET

Moving on to the next parameter with the button **K-/PROG.GR1**, it is possible to change the temperature offset for group 3.
When confirmation is given with **K+/ONOFF.GR1 t**he previously set value of the parameter is shown which may be varied from 1 to 30°C in steps of 1°C.
If you want to change it, use the buttons **K+/ONOFF.GR1** and **K-/PROG.GR1** and wait 2 seconds for it to be automatically memorised.

TO LEAVE THE TECHNICAL LEVEL PROGRAMMING PHASE YOU MUST SWITCH THE PIDBULL CONTROL OFF AND ON AGAIN.

ALARM SIGNAL

TEMPERATURE PROBE UNCONNECTED / INTERRUPTED

If the boiler temperature probe is unconnected or interrupted or if it determines a temperature around 0°C, within 5 seconds an alarm indication is given.

A1 boiler probe group 1
A3 boiler probe group 2
A5 boiler probe group 3

The heating and the button K-/PROG.GRx are disabled.
The alarm disappears when the temperature returns within acceptable values.
It is possible to switch off the control by pressing the button K+/ONOFF.GRx.

TEMPERATURE PROBE SHORT CIRCUITING / EXCESS TEMPERATURE

In the case of a short circuited boiler temperature prone or in the case of a temperature higher than a determined value for 5 consecutive seconds, an alarm warning is given.

A2 boiler probe group 1
A4 boiler probe group 2
A6 boiler probe group 3

The alarm threshold is **140°C.**

The heating and the button K-/PROG.GRx are disabled.
The alarm disappears when the temperature returns within acceptable values.
It is possible to switch off the control by pressing the button K+/ONOFF.GRx.

PRESET DEFAULT DATA

The factory presetting allows you to delete the data memory completely and load standard values for all the memorised data, even those that are not modified by the presetting.

This must be carried out, for example, after the programming of the microprocessor if that has also reset its EEPROM memory, or when a software update has affected one or more stored data or added new ones.

So when switching on press the button **K+/ON/OFF.GR1** and wait for the display to show the letters **PrS**; when preset is complete the following appears on the display:

To return to normal operation you must switch off and on again.

After a factory preset it is necessary to recheck and if necessary reset all the parameters of the PIDBULL control.

The preset does not change the configuration of the number of keyboards.

when switching on

PRESET

PROCEDURES IN THE EVENT OF A POWER CUT

In the event of an interruption in the power supply, when power returns the doser resumes the status (IDLE-ON or OFF) that it was in at the time of the power cut.
Any distributions in progress are aborted.
All dosing data are memorised.